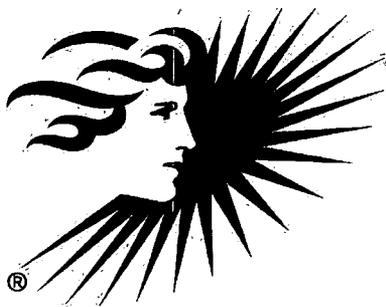


Attachment 26
NRC3-09-0017

Enclosure 1

**Fermi 3 US Corps of Engineers Response to
Requests for Additional Information December 2009**
(following 197 pages)

DTE Energy[®]



Detroit Edison

**Fermi 3
US Corps of Engineers
Response to Requests for
Additional Information**

**Revision 0
December 2009**

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Acronyms

ac.	Acre
AHS	Auxiliary Heat Sink
amsl	Above Mean Sea Level
APE	Area of Potential Effect
BMPs	Best Management Practices
COL	Combined License
Conceptual Mitigation Plan	Conceptual Wetlands Mitigation Plan
cu yd.	Cubic Yard
CWA	Clean Water Act
CWS	Circulating Water System
CZMA	Coastal Zone Management Act
DCD	Design Control Document
DFIRM	Digital Flood Insurance Rate Map
DRIWR	Detroit River International Wildlife Refuge
EAB	Exclusion Area Boundary
EPA	Environmental Protection Agency
ER	Environmental Report
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
Fermi	Detroit Edison Enrico Fermi Atomic Power Plant
Fermi 1	Enrico Fermi Atomic Power Plant, Unit 1
FSAR	Final Safety Analysis Report
gpm	Gallons per Minute
IGLD	International Great Lakes Datum
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
mi.	mile
MWh	Megawatt-Hour
NDCT	Natural Draft Cooling Tower
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration

NPDES	National Pollutant Discharge Elimination System
NPHS	Normal Power Heat Sink
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Registry of Historic Places
NWI	National Wetlands Inventory
O&M	Operations and Maintenance
OSA	Office of the State Archaeologist
PAP	Primary Access Portal
PEM	Palustrine Emergent Marsh
PFO	Palustrine Forested
PIPP	Pollution Incident Prevention Plan
Plan	Michigan 21st Century Electric Energy Plan
PS	Public Service
PSS	Palustrine Scrub-Shrub
PSWS	Plant Service Water System
RAIs	Requests for Additional Information
ROI	Region of Interest
REMP	Radiological Environmental Monitoring Program
SESC	Soil Erosion and Sedimentation Control
SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasure
Study	Submerged Site Sensitivity Study
SWPPP	Storm Water Pollution Prevention Plan
UFSAR	Updated Final Safety Analysis Report
USACE	U.S. Army Corp of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
WHC	Wildlife Habitat Council

Executive Summary

This document (the USACE Report) constitutes Detroit Edison's response to United States Army Corps of Engineers (USACE) requests for additional information (RAIs) 1, 2, and all subparts. The USACE Report was prepared using the Clean Water Act (CWA) 404(b)(1) guidelines (40 CFR Part 230), the USACE public interest factors (33 CFR Part 320.4), and the USACE Detroit District generic master template document. The purpose of the USACE Report is to assist the USACE in assessing compliance with the CWA Section 404(b)(1) guidelines and determining whether the project is compatible with the public interest.

The evaluation of proposed actions and alternatives (Chapter 2) and assessment of impacts (Chapter 4) in the USACE Report indicate that the project will comply with the CWA Section 404(b)(1) guidelines and is compatible with the public interest. This evaluation includes analyses which clearly demonstrate that the Fermi site is:

1. The least environmentally damaging practicable alternative – The Fermi site is the practicable alternative site with the least impact on waters of the United States that does not have significant adverse impacts on other environmental resources.
2. Compatible with the public interest – The project will not result in significant adverse impacts on relevant public interest factors.

In addition to compliance with state and federal requirements, implementation of appropriate and practicable steps will minimize potential adverse impacts of discharges and ensure that the construction and operation of Fermi 3 will not result in significant degradation of wetlands and the aquatic environment. Further, the project proposes appropriate and practicable mitigation to offset the anticipated permanent loss of wetlands within the USACE's jurisdiction.

This comprehensive CWA 404(b)(1) and Fermi site-specific public interest factor evaluation clearly demonstrates that the Fermi site has the smallest overall impact on environmental resources and is in accordance with the public's interest. Therefore, the Fermi site is the environmentally preferred location for the construction and operation of Fermi 3 within Detroit Edison's service area.

Chapter 1 Introduction

The USACE Report constitutes Detroit Edison's response to USACE RAIs 1 and 2 (and all subparts) concerning the Fermi 3 project, provided to Detroit Edison on May 12, 2009. A copy of the USACE RAIs is included in Appendix A of the USACE Report. Table 1-1 correlates the USACE RAIs to the RAI response's location within the USACE Report.

The USACE Report was prepared utilizing the CWA 404(b)(1) guidelines (40 CFR Part 230), the USACE public interest factors (33 CFR Part 320.4), and the USACE Detroit District generic master template document that facilitates consideration of the range of all possible impacts from projects within the purview of the USACE Regulatory Program. Based on the content of the above documents, the USACE Report discusses the project alternatives considered and the relevant environmental issues associated with those alternatives and the environmental impacts associated with the Fermi 3 project.

1.1 Project Authority

Detroit Edison proposes to construct and operate a new nuclear power plant at the Fermi site. The proposed unit is to be designated as Fermi 3. Federal action resulting in the issuance of a Combined License (COL) by the U.S. Nuclear Regulatory Commission (NRC) under 10 CFR 52, Subpart C, "Combined Licenses for Nuclear Power Plants," is anticipated.

The USACE administers a regulatory program to protect U.S. aquatic resources, including wetlands, under Section 10 of the 1899 Rivers and Harbors Act (Section 10) and Section 404 of the 1977 CWA (Section 404). Section 10 regulates work and structures in or affecting navigable waters of the United States, and Section 404 regulates the discharge of dredged or fill material into waters of the United States, including wetlands. As stated in correspondence dated March 3, 2009, between the USACE and the NRC, the USACE accepted responsibility as a cooperating agency with the NRC, as required under 40 CFR 1501.6 (Reference 1.1-1).

1.1.1 Federal Actions and National Environmental Policy Act (NEPA) Process

After a review of the project, the USACE indicated in the March 3, 2009 letter to the NRC that the Fermi 3 project is likely to require USACE authorizations under both Section 10 and Section 404, as listed below (Reference 1.1-1):

- Section 10 - Dredging for a barge access slip.
- Section 10 - Construction of a barge slip, plant cooling water discharge line, and water intake.
- Section 404 - Any dredged/fill discharges associated with the construction of a barge slip, plant cooling tower, and water intake in Lake Erie.
- Section 10 - Any other work or construction of structures in areas located waterward of the ordinary high water mark of Lake Erie.
- Section 404 - Any dredged/fill discharges in wetlands located waterward of the ordinary high water mark of Lake Erie.
- Section 404 - Any dredged/fill discharges in wetlands adjacent to Lake Erie and located landward of the ordinary high water mark of Lake Erie.

As stated in Section 1.2, Status of Review, Approvals, and Consultations, of the Fermi 3 Environmental Report (ER), submitted to the NRC in September 2008, Detroit Edison has not yet pursued the necessary federal, state, or local authorizations for the Fermi 3 project. Detroit Edison will obtain the necessary authorizations prior to initiating the regulated activities associated with the construction and operation of a new unit.

1.1.2 USACE Report Contents

The USACE Report contains an executive summary, four chapters, and a conclusion. Chapter 1 describes the project purpose and need, as defined by Detroit Edison, and provides a project overview and background. Chapter 2 describes the proposed action and other alternatives considered as part of project planning, including the no-action alternative. Chapter 3 provides a baseline description of the affected environment for each public interest factor identified in 33 CFR Part 320.4. Chapter 4 provides the results of investigations into the potential environmental consequences of the project as proposed at the Fermi site. Appendix A contains a copy of the USACE RAIs. Appendix B provides a listing of the letters and associated RAI responses provided by Detroit Edison to the NRC in response to NRC RAIs related to the Environmental Review. Appendix B also provides the ascension numbers associated with the above submittals. Ascension numbers are unique numbers assigned to documents received by the NRC that may be used within the NRC's Agencywide Documents Access and Management System to retrieve the associated documents. Appendix C provides the results of the cut and fill, and wetland minimization analysis for the alternative sites.

The USACE Report was developed in response to USACE RAI 1 and USACE RAI 2 using the above referenced CWA 404(b)(1) guidelines, public interest factors, and the Detroit District USACE Generic Template. The development of the USACE Report was significantly supported by the following two documents:

1. The Environmental Report, Rev 0, submitted to the NRC on September 18, 2008.
2. Responses to NRC RAIs submitted during the year 2009.

Table 1-1 indicates the location of information which responds to each of the USACE RAIs within the USACE Report.

1.1.3 References

- 1.1-1 Department of the Army, Detroit District, Corps of Engineers letter to U.S. Nuclear Regulatory Commission, March 3, 2009 (ML090850037).

1.2 Proposed Project

As stated in ER Section 1.1, The Proposed Project, Detroit Edison proposes to construct and operate a new nuclear power plant on the Fermi site. The proposed unit is to be designated as Fermi 3. Federal action resulting in the issuance of a COL by the NRC under 10 CFR 52, Subpart C, "Combined Licenses for Nuclear Power Plants," is anticipated.

1.2.1 Project Location

ER Subsection 1.1.2, Site Location and Section 2.1, Station Location, describe the proposed location of Fermi 3 on the existing Fermi site. As stated in ER Subsection 1.1.2, the proposed location of Fermi 3 is the existing Fermi site. The Fermi site, the area within the Fermi property boundary, consists of approximately 1,260 acres (ac.) in eastern Monroe County, Michigan. It is situated along the western shoreline of Lake Erie. It is approximately 24 miles (mi.) northeast of Toledo, Ohio; 30 mi. southwest of Detroit, Michigan; and seven mi. west of the United States/Canadian international

border. Refer to ER Section 2.1 and the following ER figures for additional information regarding the proposed project's location.

- ER Figure 2.1-1, Site Region within 50-Mile Radius.
- ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius.
- ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1.
- ER Figure 2.1-4, Fermi 3 Site Plan, as revised by NRC RAI GE3.1-1.
- ER Figure 2.1-5, Aerial View of Main Plant Area Looking North, Fermi Site.

1.2.2 Project Description

As stated above and in ER Subsection 1.1.6, Proposed Action and Constraints, Detroit Edison proposes to construct and operate a new nuclear power plant at the Fermi site. The 10 CFR 52 licensing process is being followed to obtain a combined license from the NRC. Prior to commencement of construction, numerous other permits and approvals will be required from federal, state, and local agencies. The required permits and approvals, including those from the USACE, are discussed in ER Section 1.2, Status of Review, Approvals, and Consultations.

The following project description and impact analysis utilizes the most recent site plans as submitted to the NRC within an August 26, 2009 letter from Detroit Edison (Reference 1.2-1). The plans contained within the Fermi 3 COL application submitted in September 2008 are the original site plans. Refer to the response to NRC RAI GE3.1-1 for a description of the ER revisions based on the Fermi 3 site plans.

1.2.2.1 Major Activity Start and Completion Dates

Refer to ER Subsection 1.1.7, Major Activity Start and Completion Dates, for the estimated dates related to the construction and operation of Fermi 3. Additional information regarding the anticipated construction sequence and equipment use is to be developed for inclusion in the Joint Permit Application, which Detroit Edison is planning to submit to the USACE and the Michigan Department of Environmental Quality (MDEQ) by July 1, 2010.

1.2.2.2 Assumption of Jurisdiction Area

For the purposes of this report, it is assumed that the USACE has jurisdiction over all delineated wetlands on the Fermi site. In the absence of a USACE jurisdictional determination, this assumption was made to ensure that baseline information and impact assessments for all onsite wetlands are captured in the USACE Report. Although the MDEQ has jurisdictional authority over wetlands located at the Fermi site, the USACE Report focuses solely on responding to the USACE RAIs and does not address potential state wetland permitting actions or concerns.

1.2.2.3 Work and Structure Information

The construction and operation of Fermi 3 will require various types of work and/or structures. ER Section 1.1, The Proposed Project, provides brief descriptions of the proposed reactor and cooling system. ER Chapter 3, Plant Description, as revised by NRC RAI GE3.1-1, NRC RAI AE5.2.2-1, NRC RAI AQ3.6.3-2, NRC RAI TR3.8-1, NRC RAI TR3.8-2, NRC RAI TR3.8-3, NRC RAI TR3.8-4, and NRC RAI TR3.8-5, provides detailed discussions regarding the construction and operation of Fermi 3. ER Chapter 3 also describes the parameters associated with Fermi 3

appearance, water use, and relationship to the surrounding area. The following is a list of subjects contained within ER Chapter 3:

- Section 3.1, External Appearance and Plant Layout.
- Section 3.2, Reactor Power Conversion System.
- Section 3.3, Plant Water Use.
- Section 3.4, Cooling System.
- Section 3.5, Radioactive Waste Management System.
- Section 3.6, Nonradioactive Waste Systems.
- Section 3.7, Power Transmission System.
- Section 3.8, Transportation of Radioactive Materials.

1.2.2.4 Figures of Existing Fermi Site Conditions

The figures listed below are included within the USACE Report and depict plan or cross-sectional views of existing site conditions, as requested within USACE RAI 1g:

- Figure 1.2-1, Drawing List.
- Figure 1.2-2, Fermi 2 - Exclusion Area Boundary Plan View
- Figure 1.2-3, Existing Intake Canal Plan View.
- Figure 1.2-4, Existing Intake Canal Cross Section.
- Figure 1.2-5, Dredge Disposal Storage Basin Plan View.
- Figure 1.2-6, Dredge Disposal Storage Basin Discharge Weir Cross Section.
- Figure 1.2-7, Dredge Disposal Storage Basin Cross Sections.
- Figure 1.2-8, Fermi 2 General Service Water System Intake Structure – Plan View.
- Figure 1.2-9, Fermi 2 General Service Water System Intake Structure – Cross Section.
- Figure 1.2-10, Existing Natural Features Plan View.
- Figure 1.2-11, Existing Natural Features Cross Section A-A' (Fermi 2 Updated Final Safety Analysis Report, Figure 2.5-15).
- Figure 1.2-12, Existing Natural Features Cross Section B-B' (Fermi 2 Updated Final Safety Analysis Report, Figure 2.5-16).

Figure 1.2-2 provides a plan view of the existing exclusion area boundary (EAB). A cross-sectional view of the exclusion area is contained in ER Figure 2.1-5, Aerial View of Main Plant Area Looking North, Fermi Site.

Figures 1.2-3 and 1.2-4 are provided in response to the request for figures depicting existing dredging areas. Figures 1.2-5, 1.2-6, and 1.2-7 are provided in response to the request for figures depicting the existing dredged disposal area.

Figures 1.2-8 and 1.2-9 provide a plan view and cross-sectional view of the Fermi 2 General Service Intake Structure in response to the request for figures depicting existing shoreline structures.

Figure 1.2-10 provides a plan view of the onsite lagoons in response to the request for figures depicting existing natural features. Figures 1.2-11 and 1.2-12 depict the subsurface cross sections noted on Figure 1.2-10.

The following list of figures provides additional examples of figures within the ER and NRC RAI responses depicting existing site conditions requested by the USACE within USACE RAI 1g:

Exclusion Area Boundary

- ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1.

Dredging/Disposal Area

- NRC RAI Response HY2.3.1-2, Maps of Isopach Contour Maps and Descriptions of the Area Extent and Depth of All Existing Gravel Fills on the Fermi Site and Copies of Limited Fermi 1 and Fermi 2 Construction Drawings.
- NRC RAI Response HY2.3.1-3, East-West Geologic Cross Sections that Extend West of the Fermi Site Showing the Clay Dike, Gravel Fill, Native Lacustrine Clay, Tills, Sand and Gravel Above the Dolomite Bedrock, and the Dolomite Bedrock.

Shoreline Structures

- ER Figure 2.3-14, Shore Barrier Plan and Sections.

Natural Features

- ER Figure 2.4-2, Topographic Map Showing Fermi Property Boundary (Base map: USGS 1:24,000 7.5 Minute Topographic Series).
- ER Figure 2.4-5, Terrestrial Habitats and Developed Areas at the Fermi Site.
- ER Figure 2.4-7, Fermi Site Map.
- ER Figure 2.4-19, Fermi Site Wetlands Delineation.
- NRC RAI Response TE2.4.1-7, Eagle Nest Location Map.
- NRC RAI Response TE2.4.1-8, Fox Snake Sighting Map (TE2.4.1-8 Response Figure 8).
- NRC RAI Response TE4.3.1-5, Topographic Map of the Fermi Site with 1-Foot Contours.

1.2.2.5 Figures of Fermi 3 Related Structures and Areas

The figures listed below are included within the USACE Report and depict plan or cross-sectional views of Fermi 3 related structures and areas, as requested within USACE RAI 1g. These figures provide the work and structure locations, and approximate work and structure dimensions. As noted in Subsection 1.2.2, the Fermi 3 ER submitted in September 2008 contained the original Fermi 3 site plans that have since been revised to reduce impacts to wetlands. The USACE Report uses Fermi 3 site plans to conduct a complete impact assessment. The response to NRC RAI GE 3.1-1 may also be reviewed to obtain Fermi 3 site plans (it should be noted that the terms *site layout*, *site plan*, and *site arrangement* may be used interchangeably):

- Figure 1.2-13, Fermi 3 Discharge Pipe Dredging Plan View.
- Figure 1.2-14, Fermi 3 Discharge Pipe Dredging Cross Section.
- Figure 1.2-15, Fermi 3 Temporary Work Area Plan View.
- Figure 1.2-16, Fermi 3 Temporary Work Area Cross Section.
- Figure 1.2-17, Fermi 3 Excavation Spoil Material Disposal Plan View.
- Figure 1.2-18, Fermi 3 Spoil Material Disposal Details.
- Figure 1.2-19, Fermi 3 Road Plan View.
- Figure 1.2-20, Fermi 3 Road Cross Sections.
- Figure 1.2-21, Fermi 3 - Exclusion Area Boundary Plan View.
- Figure 1.2-22, Potential Wetlands Construction Impacts (refer also to ER Figure 4.3-5 as revised by NRC RAI GE3.1-1).

Figures 1.2-13 and 1.2-14 are provided in response to the request for figures depicting anticipated dredged areas. As indicated in the response to NRC RAI HY4.2.1-7, figures depicting any required barge facilities would be provided as necessary with a Joint Permit Application. As indicated in the response to HY4.2.1-7, it is not anticipated that dredging outside the parameters of ongoing Fermi 2 maintenance dredging would be required to allow barge deliveries to the site.

Figures 1.2-15, 1.2-16, and 1.2-22 are provided in response to the request for figures depicting the anticipated temporary work areas. Figure 1.2-15 provides a plan view depicting the complete revised site layout in addition to those areas that will be used temporarily during construction. Figure 1.2-22, Potential Wetlands Construction Impacts, illustrates the footprint and type of impacts in relation to wetland type and other waters of the United States.

Figures 1.2-17 and 1.2-18 are provided in response to the request for figures depicting the anticipated fill/disposal areas. The existing dredged spoils basin will be used during the construction and operation of Fermi 3. Figures 1.2-5, 1.2-6, and 1.2-7, depicting the existing dredged spoils basin, provide the requested plan view and cross sections.

Figures 1.2-19 and 1.2-20 are provided in response to the request for figures depicting the roads and structures.

Figure 1.2-21 provides a plan view of the Fermi 3 EAB, as requested. ER Figure 3.1-1, Aerial View of Fermi Site Looking North – Fermi 3 Superimposed, as revised by NRC RAI GE3.1-1, provides a cross-sectional view of the exclusion area.

The following list identifies figures within the ER and NRC RAI responses that depict Fermi 3 related structures and areas requested by the USACE within USACE RAI 1g:

Dredging/Disposal Area

- NRC RAI Response HY2.3.1-7, Contour Map Showing the Elevation of the Bottom of All Proposed Excavations and Maps that Show the 3-Dimensional Extent of All Proposed Rock Fills for Fermi 3.

Shoreline Structures

- ER Figure 3.4-1, Station Water Intake Structure.
- ER Figure 3.4-2, Station Water Intake Structure – Elevation View.
- ER Figure 3.4-6, Outfall Diffuser Arrangement.
- ER Figure 5.3-1, Station Layout with Intake, Discharge and Outfalls.
- NRC RAI Response HY2.3.1-9, Bathymetry in the Vicinity of the Discharge Structure.

Natural Features

- ER Figure 4.2-1, Construction Affected Areas, as revised by NRC RAI GE3.1-1.
- ER Figure 4.3-1, Fermi 3 Impacts to Undeveloped Areas (yellow lines) on Fermi Site (red line), as revised by NRC RAI GE3.1-1.
- ER Figure 4.3-2, Permanent and Temporary Impacts to Undeveloped Areas from Fermi 3 Construction Overlaid on Existing Terrestrial Communities, as revised by NRC RAI GE3.1-1.
- ER Figure 4.3-3, Permanent and Temporary Impacts to DRIWR, Lagoon Beach Unit from Fermi 3 Construction Overlaid on Existing Terrestrial Communities, as revised by NRC RAI GE3.1-1.
- ER Figure 4.3-4, Permanent and temporary impacts to undeveloped areas of the Fermi property (red line) from the EF3 project overlaid on the existing aquatic communities, as revised by NRC RAI GE3.1-1.

The figures listed within this section provide information regarding work and structure locations; approximate work and/or structure dimensions, approximate acreage/square footage, and approximate quantities of all dredged/fill discharge areas associated with all preconstruction, construction and temporary activities/features; and best management practices (BMPs), proposed waterward of the ordinary high water mark of Lake Erie and adjacent wetlands.

1.2.2.6 References

- 1.2-1 Detroit Edison, Detroit Edison letter NRC3-09-0020 to U.S. Nuclear Regulatory Commission, August 26, 2009 (ML092450482).

1.3 Purpose and Need

The purpose and need for the proposed project is outlined below. The following information is also provided in response to NRC RAI GE1.1-1.

1.3.1 Purpose

The purpose of the project is fourfold:

1. Generate a net electrical output of approximately 1,535± 50 megawatts (MWe) for sale that will reliably aid in satisfying the forecasted energy and capacity needs of Detroit Edison customers located in the Detroit Edison Service Area;
2. Provide new baseload electric generation capacity as early as 2021 to compensate for the expected retirement of existing, aging baseload generating units and diminishing availability of the midwest independent service operator region's baseload generation capacity;
3. Provide price stability by minimizing reliance on imported power into the Detroit Edison service territory; and
4. Utilize an electric generation technology that is less subject to price fluctuations resulting from either fuel or regulatory drivers, provides fuel diversity, and reduces reliance on fossil fuel and their attendant environmental impacts.

The above purpose is in-line with Detroit Edison's mission to provide reliable and affordable electrical power.

1.3.2 Need

Construction of a new nuclear electric generating facility is needed to provide reliable, affordable power to address Michigan's expected future peak electric demand.

Chapter 8 of the Environmental Report provides detailed discussion outlining the need for power and the related benefits to be generated by the proposed facility. The need for power was assessed by balancing the current and forecasted demand against the current and forecasted supply, while demonstrating that an adequate reserve margin is maintained. Reference Chapters 8 and 9 for a complete description of the following:

- Section 8.1 – Description of the power system, an overview of the pertinent service area, and a discussion of regional relationships;
- Section 8.2 – Description of the analysis performed to determine current and forecasted energy needs in the state of Michigan;
- Section 8.3 – Description of the analysis performed to determine energy supply resources;
- Section 8.4 – Description of the assessment of the need for power; and
- Section 9.1 – Description of the no-action alternative.

Additionally, Chapters 8 and 9 provide information regarding factors such as marketing, location, and history that influence or constrain the nature, size, price, and class of the project.

The need for power assessment is derived from the "Michigan 21st Century Electric Energy Plan" (Plan) (Reference 1.3-1). The Plan was prepared and issued by the Michigan Public Service Commission pursuant to Executive Directive No. 2006-02. The Plan reached several significant conclusions, including the following:

- Michigan's peak electric demand is forecasted to grow at approximately 1.2 percent per year for the next 20 years;
- There is a need for additional electric generating resources in order to preserve electric reliability and provide affordable energy over the next 20 years. This modeling outcome is confirmed even in the presence of increased use of energy efficiency and renewable resources;
- The projected electric demand will not be satisfied through the expansion of transmission nor access to external markets; and
- There is need for regulated baseload capacity to prevent natural gas prices from driving up wholesale costs and market prices for an increasing number of hours each year.

The above conclusions were based upon key factors such as the current age of baseload units and newer electric generating units' reliance on natural gas. As indicated above, the Plan concluded that the state of Michigan has a current need for new baseload capacity and the need is projected to increase. Michigan's current baseload generating units are an average of more than 48 years old. The average age of Detroit Edison's coal-fired generation units is 44 years old. The last new baseload plant in the state of Michigan began commercial operation more than 18 years ago. The assessment assumes that older, less efficient units, totaling 3,755 MW of capacity, will be retired by 2025.

Further, new baseload electric production is needed due to the fact that recently constructed electric generation units in Michigan have been limited to natural gas-fired facilities. Natural gas-fired units currently represent approximately 29 percent of Michigan's generating capacity. Dependence upon natural gas-fired units has exposed Michigan to volatile electricity prices driven by fluctuating fuel market prices.

1.3.3 References

- 1.3-1 Michigan Public Service Commission, "Michigan's 21st Century Electric Energy Plan," submitted to Honorable Jennifer M. Granholm, Governor of Michigan, <http://www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/index.htm>, accessed 18 January 2008.

Table 1-1 Location of USACE RAI Responses within the USACE Report

USACE RAI Number	USACE RAI Brief Description	Location of Response in the USACE Report
USACE-1	Conduct a Public Interest Review	Refer to Information Below
USACE-1a	Public Interest Factor Baseline Condition Description	Chapter 3
USACE-1b	Coastal Wetlands	Subsection 3.6.1
USACE-1c	Impact Evaluation	Chapter 4
USACE-1d	Water-related and Wetland Impact Discussion	Section 4.5 and Subsection 4.18
USACE-1e	Minimization of Discharges into the Waters of the United States and Adjacent Wetlands and Compensation	Chapter 2
USACE-1f	Minimization of Detrimental Project Effects	Subsection 2.4.2
USACE-1g	Project Description and Figures	Subsection 1.2.2
USACE-1h	Consideration of General Criteria within Evaluation	Chapter 4
USACE-1i	Impact Significant Levels	Chapter 4
USACE-1j	Supporting Materials	Throughout
USACE-2	Alternative Analysis Package	Refer to Information Below
USACE-2a	Project Description/Purpose & Need	Subsection 1.2.2 and Section 1.3
USACE-2b	Avoidance - Site Selection Emphasis	Subsection 2.1.1
USACE-2c	Minimization of Wetland Impacts. Minimization Must Be Shown for Each of the Alternate Sites in the Analysis of Avoidance.	Subsection 2.2.1
USACE-2d	Supporting Records and Drawings	Throughout Appendix C

Figure 1.2-1 Drawing List

DRAWING LIST		
DRAWING NUMBER	FIGURE NUMBER	TITLE
163696-DS-00002	FIGURE 1.2-2	FERMI 2 - EXCLUSION AREA BOUNDARY PLAN VIEW
163696-DS-00004	FIGURE 1.2-3	EXISTING INTAKE CANAL PLAN VIEW
163696-DS-00005	FIGURE 1.2-4	EXISTING INTAKE CANAL CROSS SECTION
163696-DS-00006	FIGURE 1.2-5	DREDGE DISPOSAL STORAGE BASIN PLAN VIEW
163696-DS-00007	FIGURE 1.2-6	DREDGE DISPOSAL STORAGE BASIN DISCHARGE WEIR CROSS SECTION
163696-DS-00008	FIGURE 1.2-7	DREDGE DISPOSAL STORAGE BASIN CROSS SECTIONS
163696-DS-00009	FIGURE 1.2-8	FERMI 2 GENERAL SERVICE WATER SYSTEM INTAKE STRUCTURE - PLAN VIEW
163696-DS-00010	FIGURE 1.2-9	FERMI 2 GENERAL SERVICE WATER SYSTEM INTAKE STRUCTURE - CROSS SECTION
163696-DS-00011	FIGURE 1.2-10	EXISTING NATURAL FEATURES PLAN VIEW
FERMI 2 UFSAR FIGURE 2.5-15	FIGURE 1.2-11	EXISTING NATURAL FEATURES CROSS SECTION A-A'
FERMI 2 UFSAR FIGURE 2.5-16	FIGURE 1.2-12	EXISTING NATURAL FEATURES CROSS SECTION B-B'
163696-DS-00012	FIGURE 1.2-13	FERMI 3 DISCHARGE PIPE DREDGING PLAN VIEW
163696-DS-00013	FIGURE 1.2-14	FERMI 3 DISCHARGE PIPE DREDGING CROSS SECTION
163696-DS-00014	FIGURE 1.2-15	FERMI 3 TEMPORARY WORK AREA PLAN VIEW
163696-DS-00015	FIGURE 1.2-16	FERMI 3 TEMPORARY WORK AREA CROSS SECTION
163696-DS-00016	FIGURE 1.2-17	FERMI 3 SPOIL MATERIAL DISPOSAL PLAN VIEW
163696-DS-00017	FIGURE 1.2-18	FERMI 3 SPOIL MATERIAL DISPOSAL DETAILS
163696-DS-00018	FIGURE 1.2-19	FERMI 3 ROAD PLAN VIEW
163696-DS-00019	FIGURE 1.2-20	FERMI 3 ROAD CROSS SECTIONS
163696-DS-00020	FIGURE 1.2-21	FERMI 3 - EXCLUSION AREA BOUNDARY PLAN VIEW
	FIGURE 1.2-22	POTENTIAL WETLANDS CONSTRUCTION IMPACTS

Figure 1.2-2 Fermi 2 - Exclusion Area Boundary Plan View

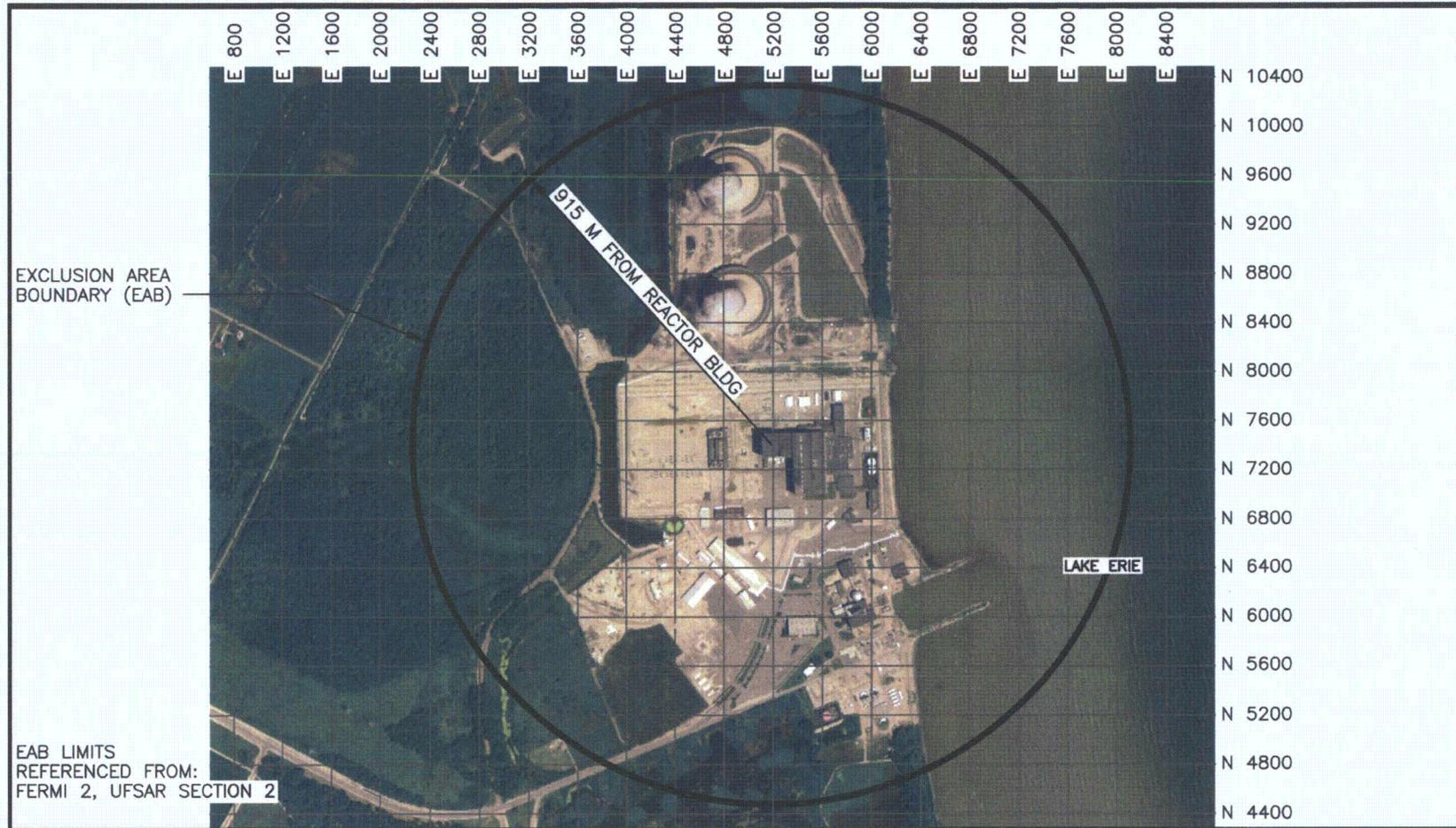


Figure 1.2-3 Existing Intake Canal Plan View

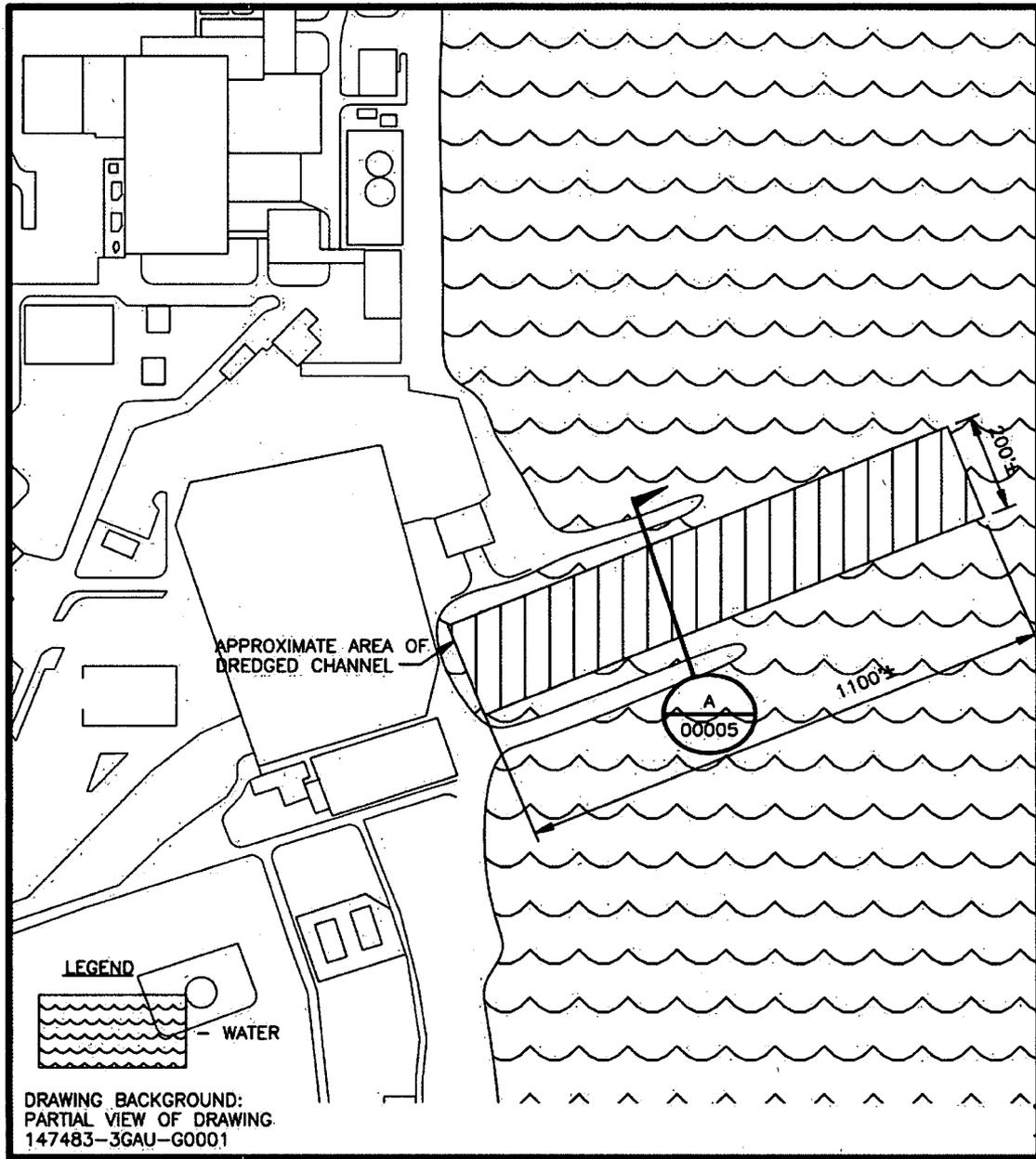


Figure 1.2-4 Existing Intake Canal Cross Section

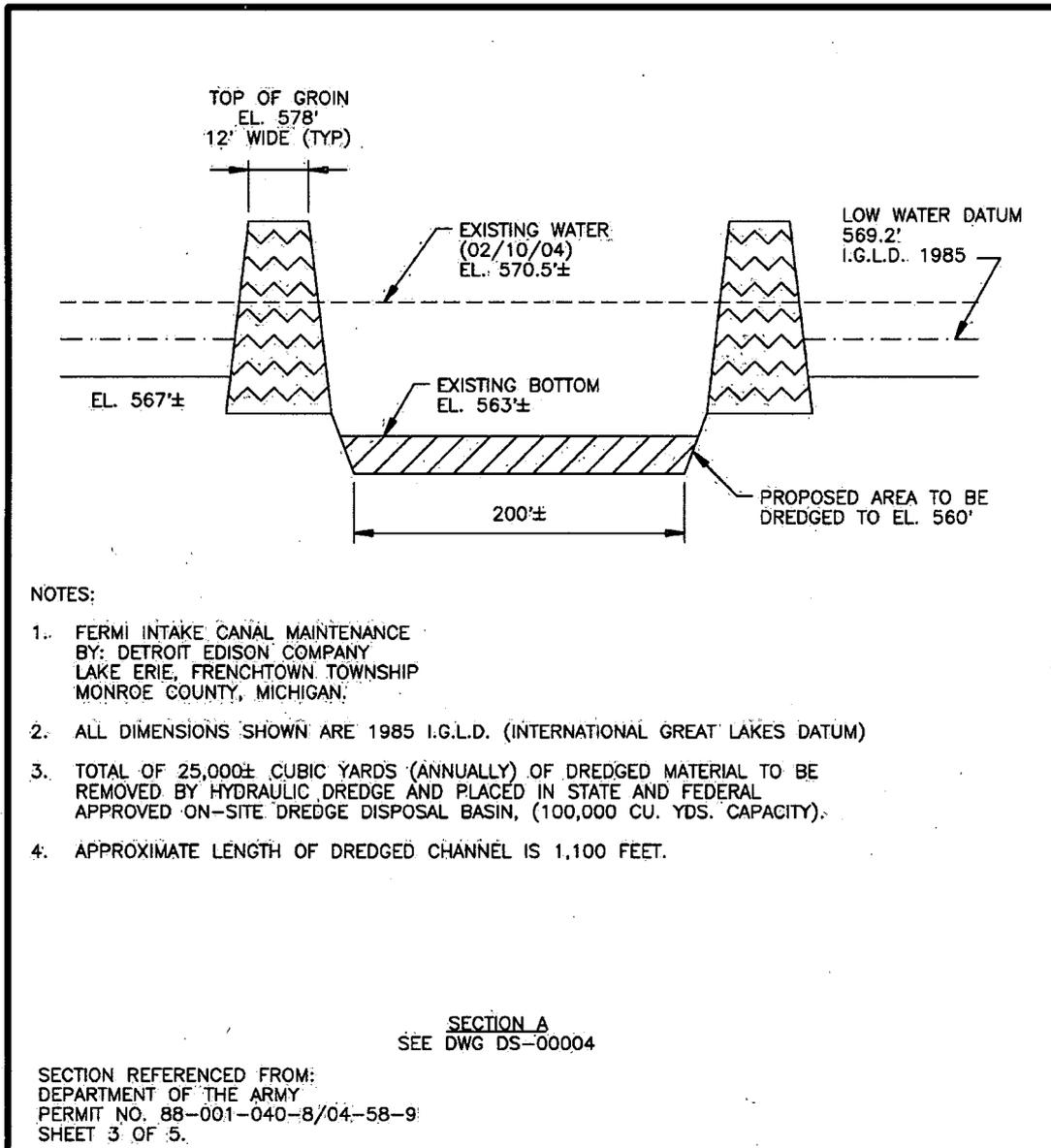


Figure 1.2-5 Dredged Disposal Storage Basin Plan View

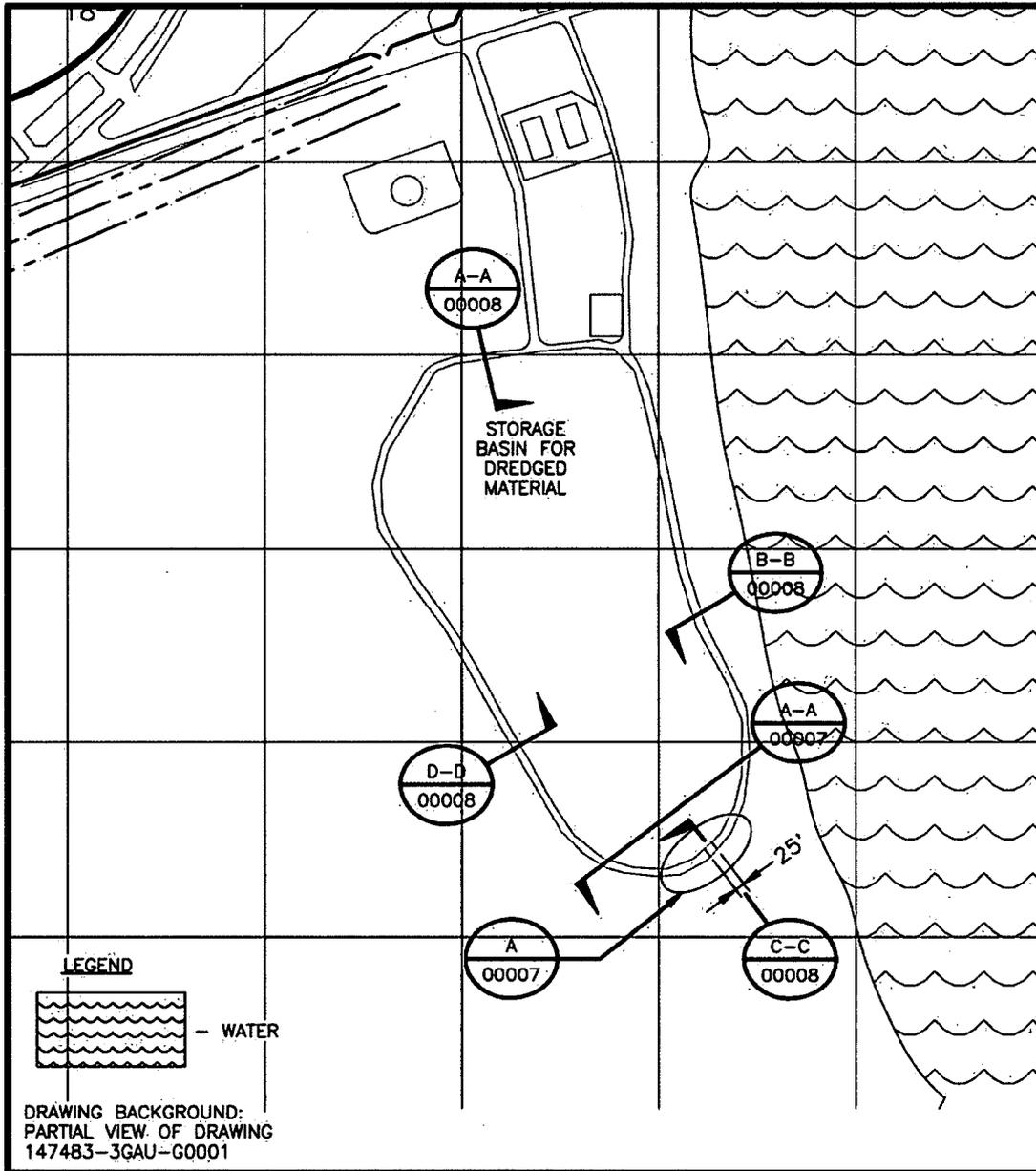


Figure 1.2-6 Dredge Disposal Storage Basin Discharge Weir Cross Section

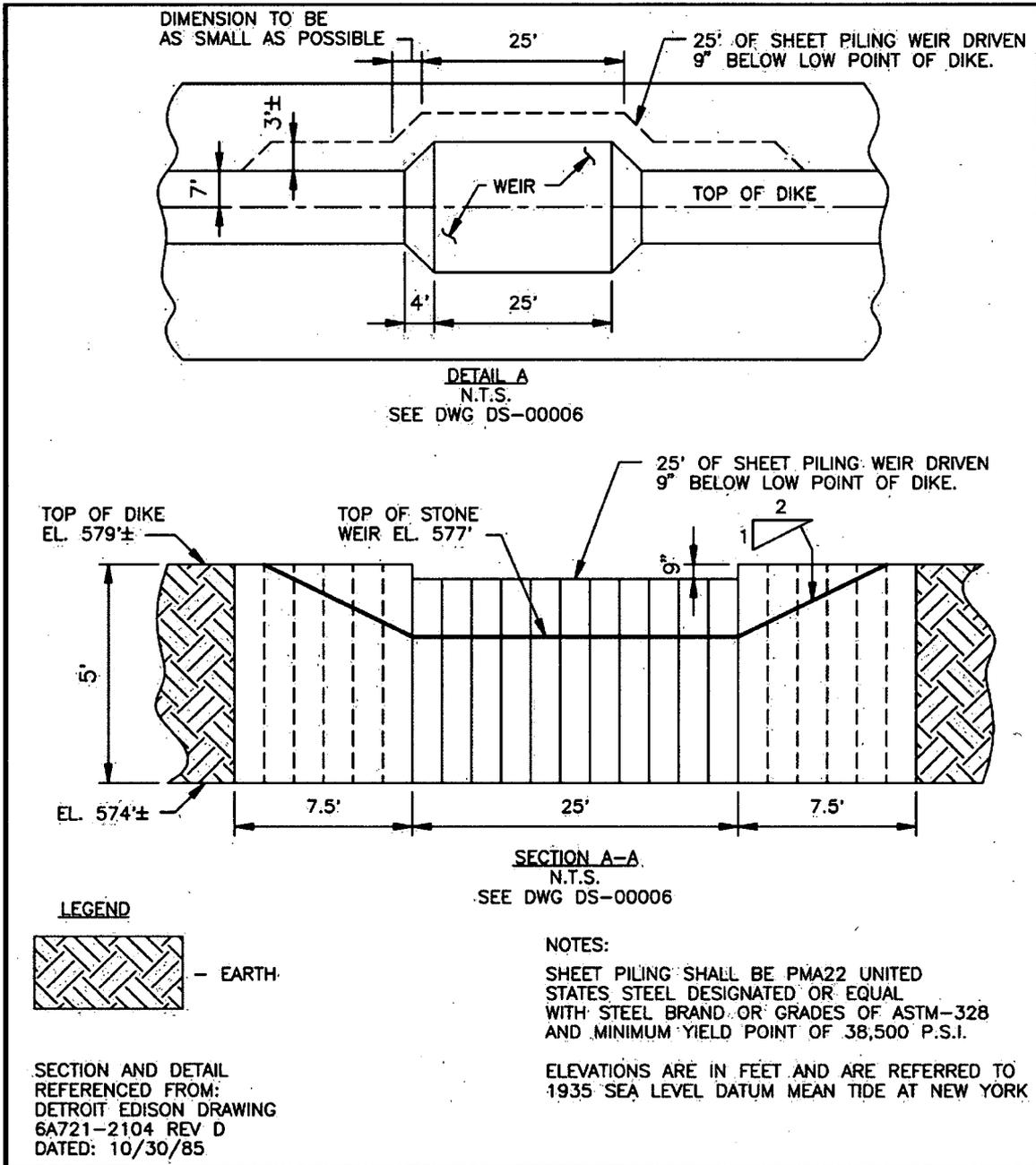


Figure 1.2-7 Dredge Disposal Storage Basin Cross Sections

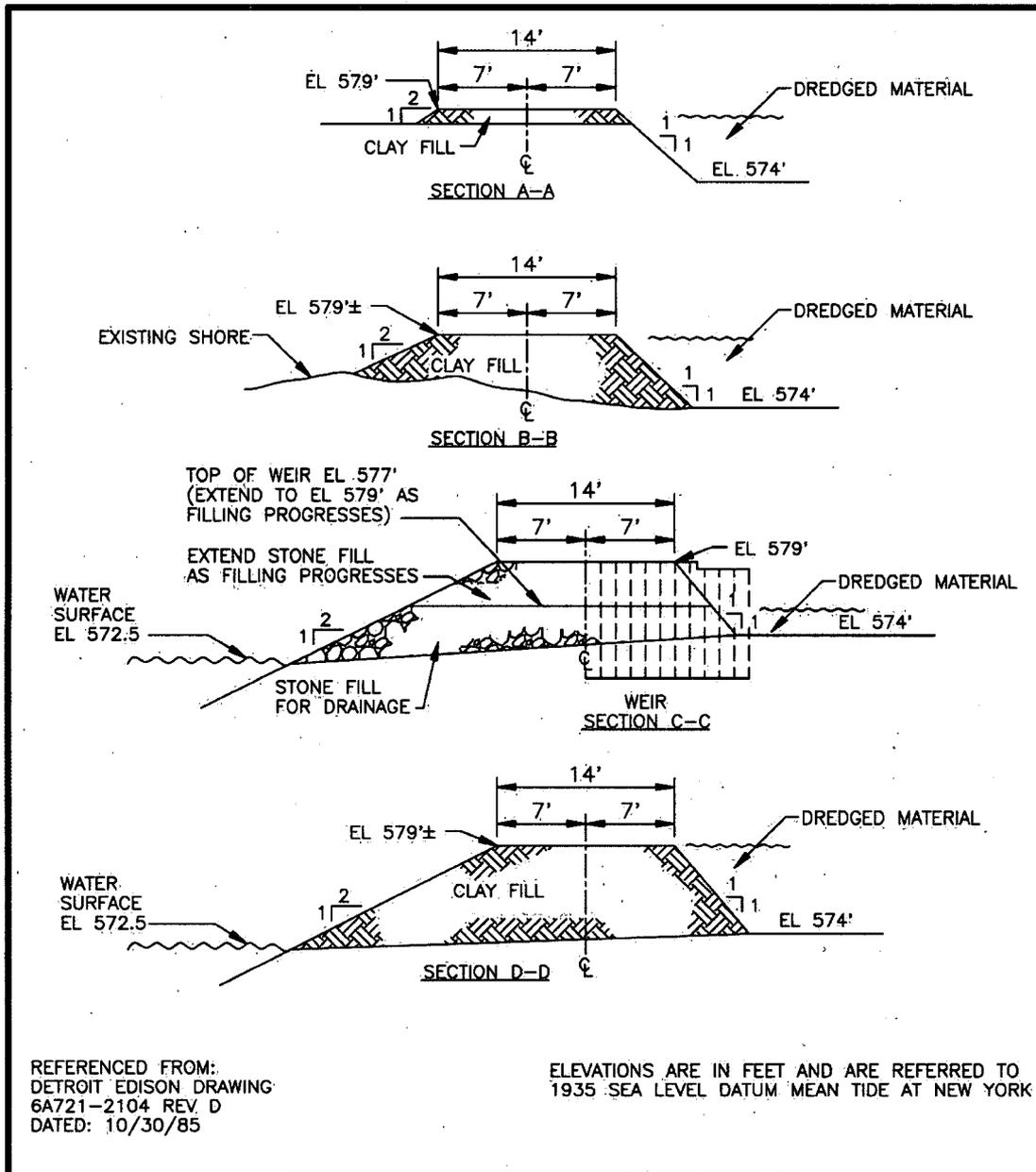


Figure 1.2-8 Fermi 2 General Service Water System Intake Structure – Plan View

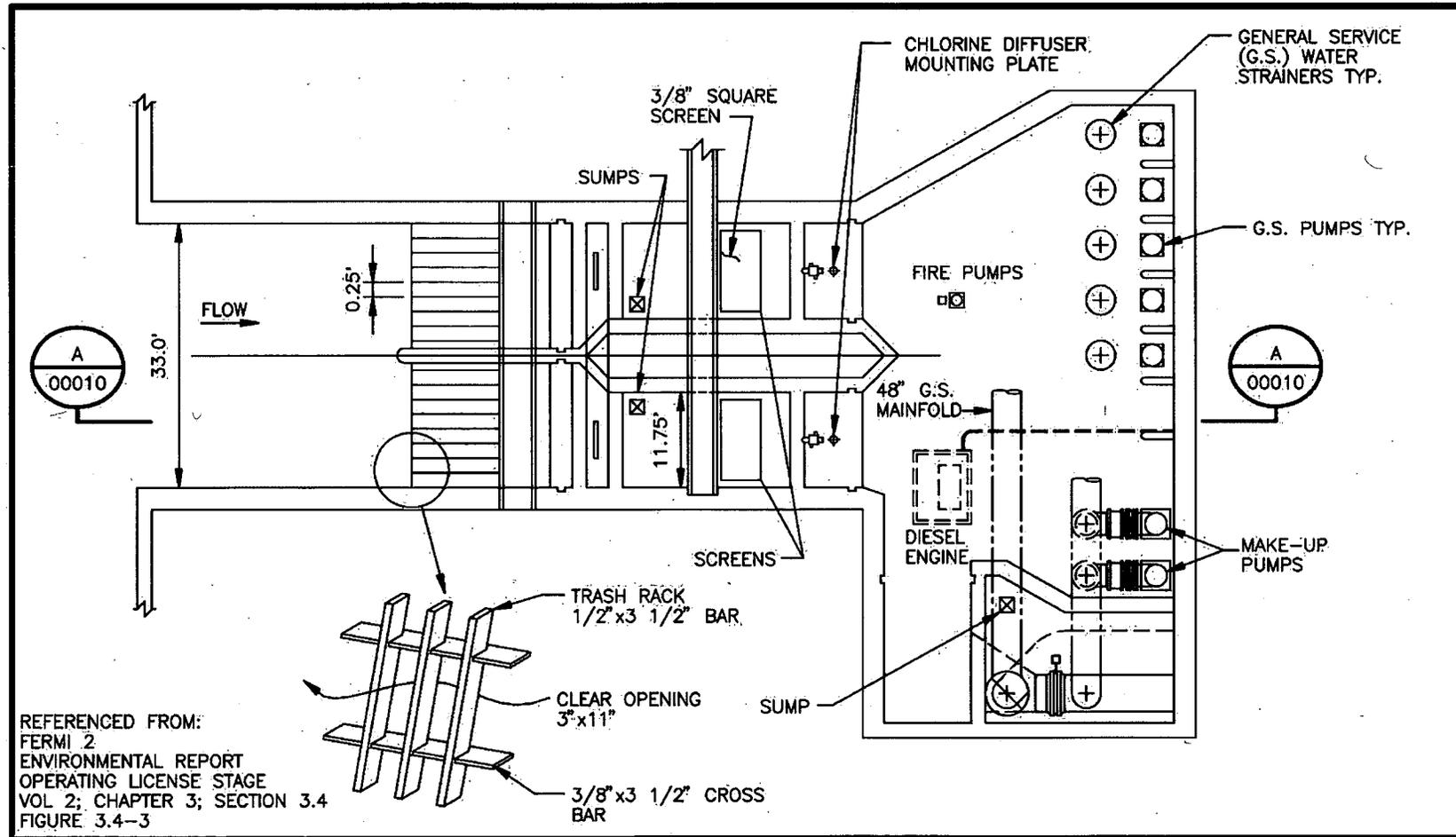


Figure 1.2-9 Fermi 2 General Service Water System Intake Structure – Cross Section

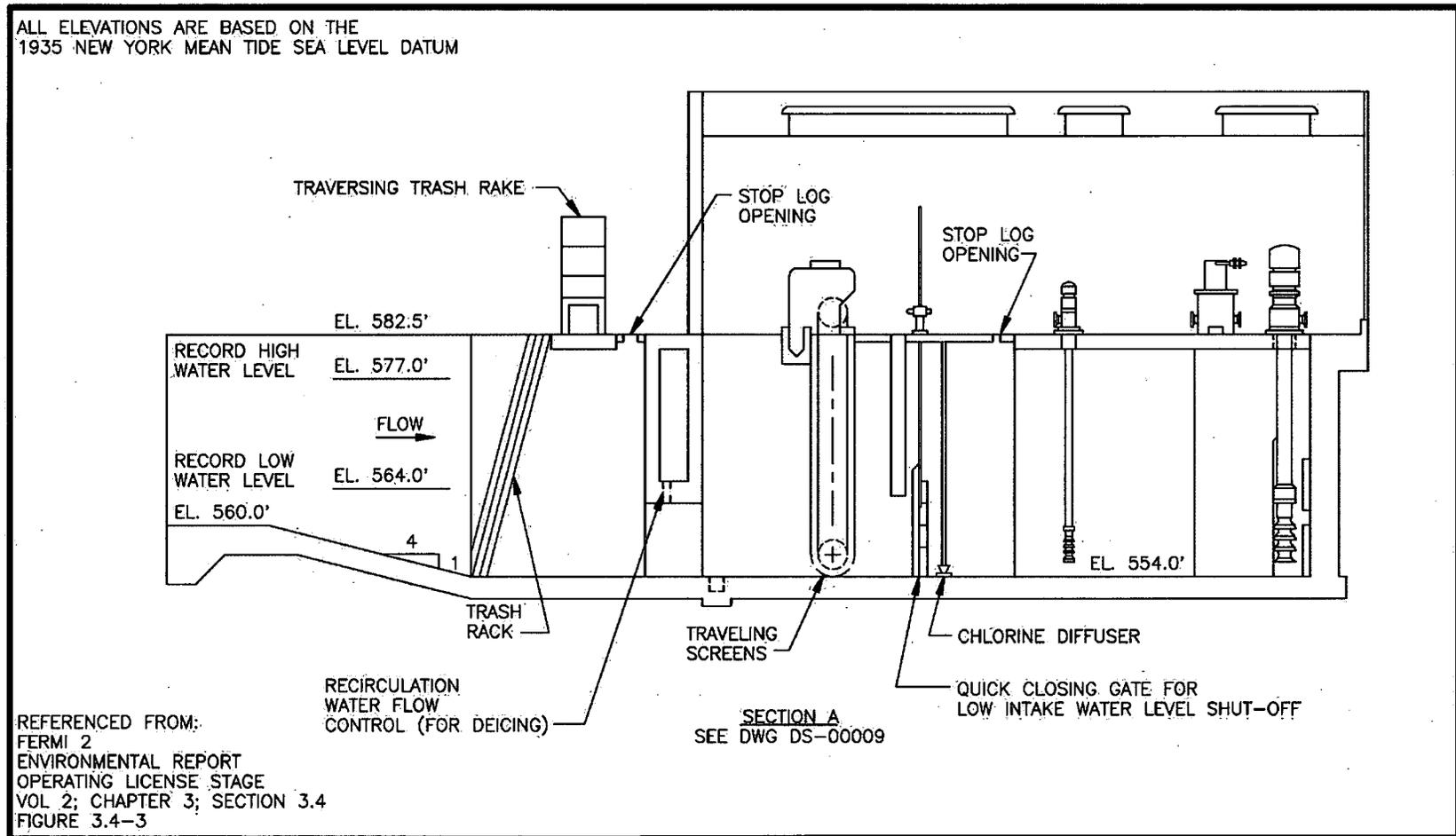


Figure 1.2-10 Existing Natural Features Plan View

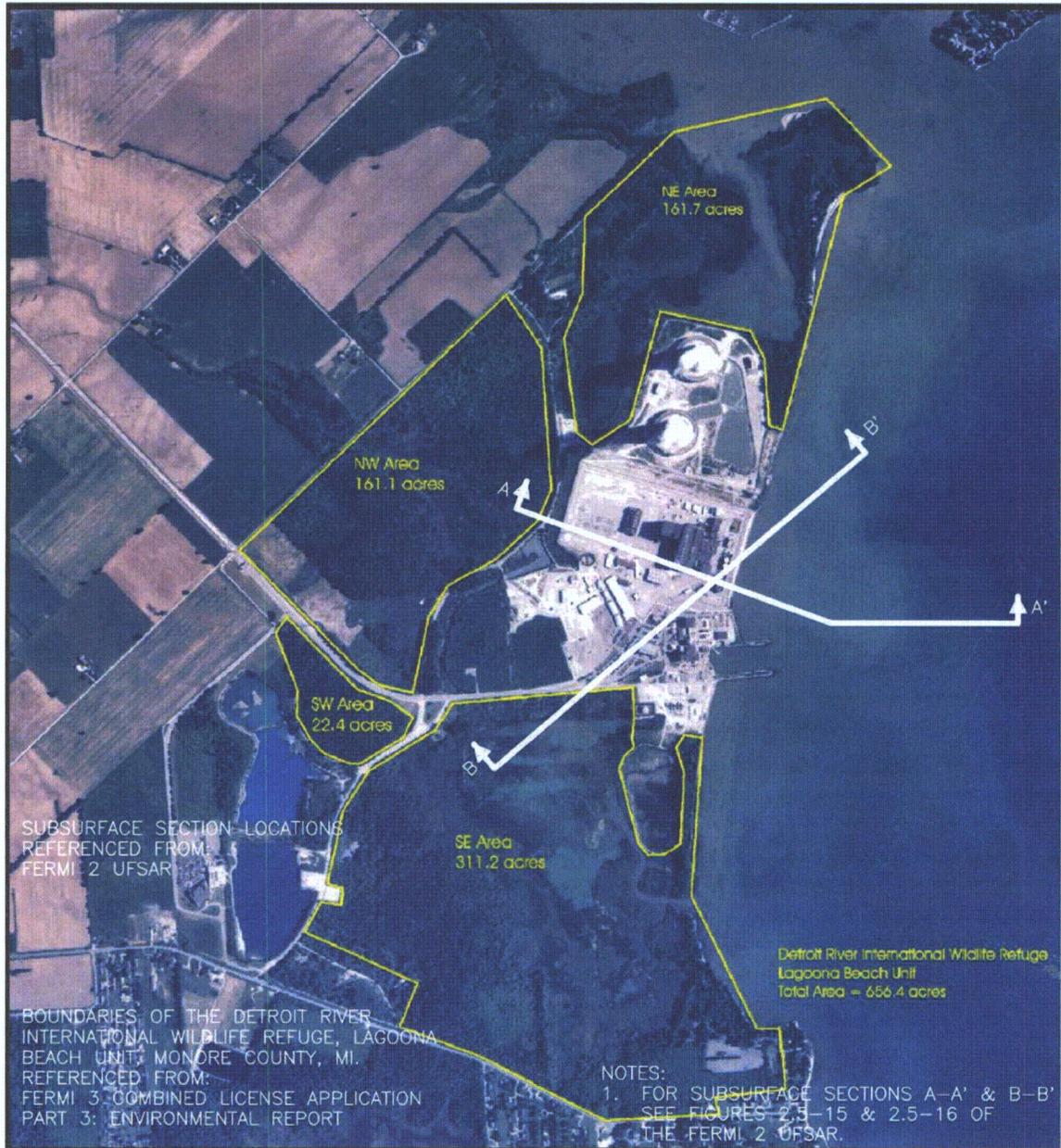
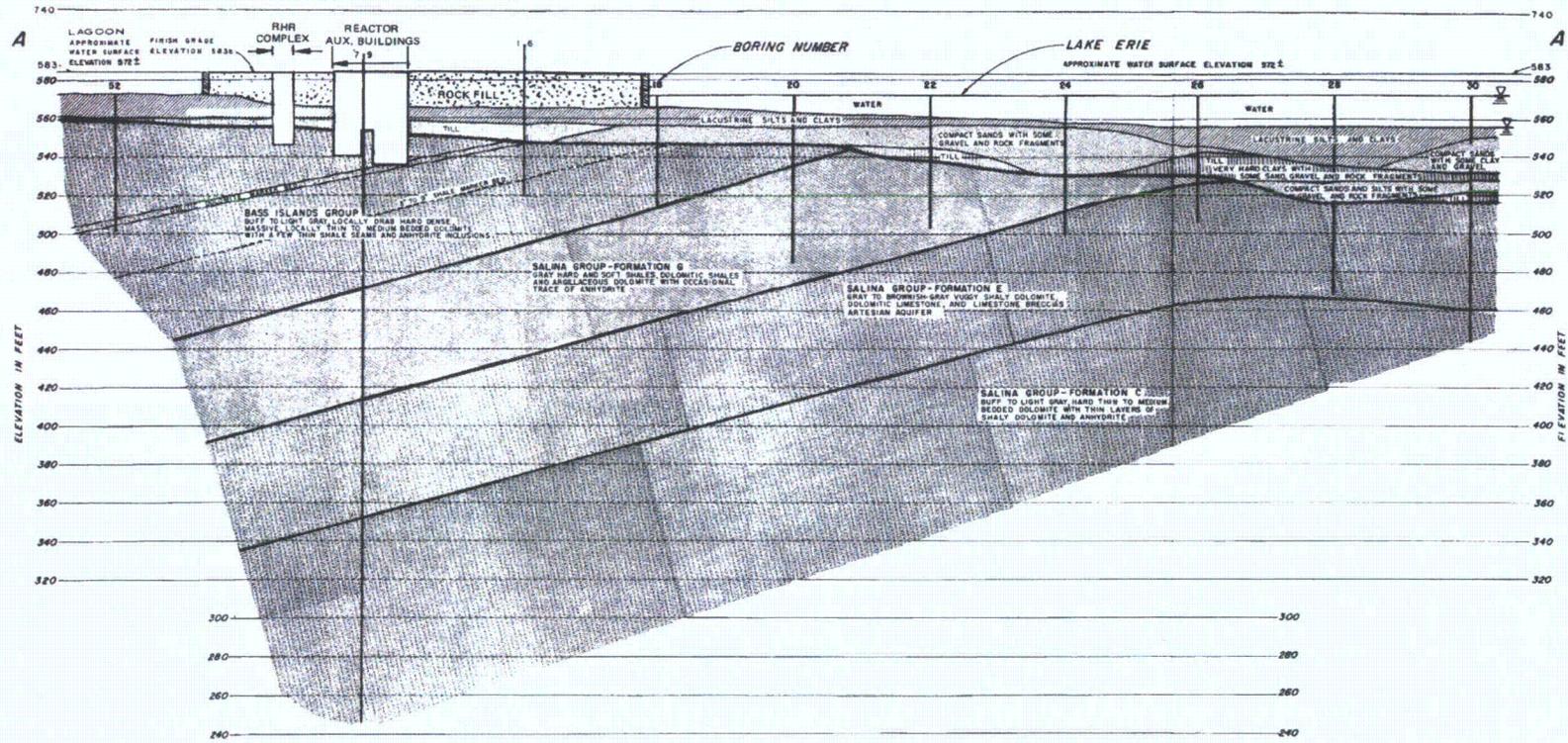


Figure 1.2-11 Existing Natural Features Cross Section A-A'



NOTES:
 ELEVATIONS REFER TO GREAT LAKES SURVEY DATUM.
 GROUND SURFACE ELEVATIONS ARE CORRECT ONLY AT TEST BORING LOCATIONS.
 THE DEPTH AND THICKNESS OF THE SOIL STRATA AND THE DEPTH OF THE ROCK STRATA INDICATED ON THE SUB-

SURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN TEST BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXISTS ONLY AT THE TEST BORING LOCATIONS AND IT IS POSSIBLE THAT THE SOIL AND ROCK CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.

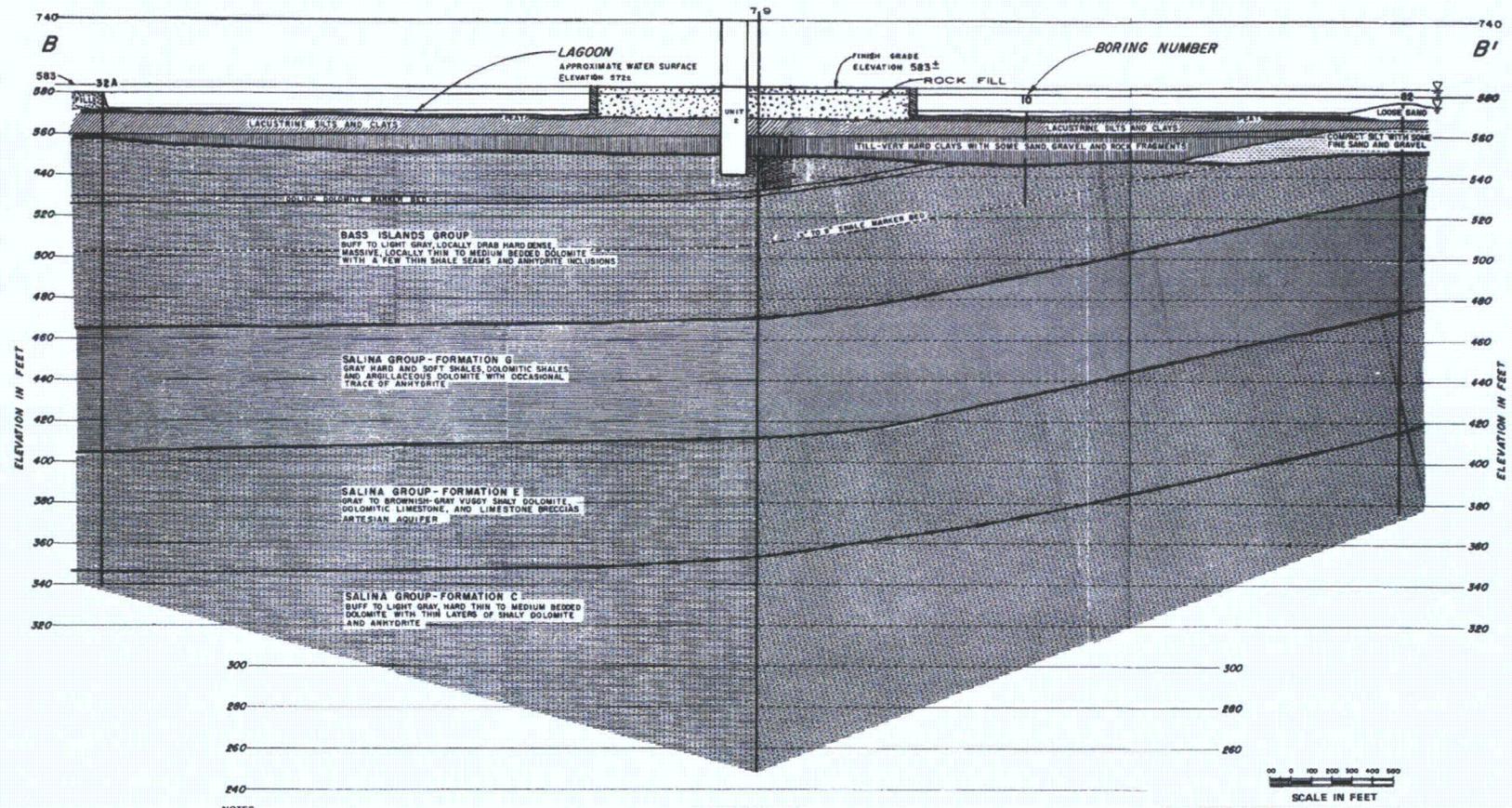
SECTION A - A'

0 100 200 300 400 500
 SCALE IN FEET

Fermi 2
 UPDATED FINAL SAFETY ANALYSIS REPORT

FIGURE 2.5-15
 SUBSURFACE SECTION A-A' FROM
 FIGURE 2.5-13

Figure 1.2-12 Existing Natural Features Cross Section B-B'



NOTES:
 ELEVATIONS REFER TO GREAT LAKES SURVEY DATUM.
 GROUND SURFACE ELEVATIONS ARE CORRECT ONLY AT TEST BORING LOCATIONS.
 THE DEPTH AND THICKNESS OF THE SOIL STRATA AND THE DEPTH OF THE ROCK STRATA INDICATED ON THE SUB-

SURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN TEST BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXISTS ONLY AT THE TEST BORING LOCATIONS AND IT IS POSSIBLE THAT THE SOIL AND ROCK CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.

SECTION B - B'

Fermi 2
 UPDATED FINAL SAFETY ANALYSIS REPORT

FIGURE 2.5-16
 SUBSURFACE SECTION B-B' FROM
 FIGURE 2.5-13

Figure 1.2-13 Fermi 3 Discharge Pipe Dredging Plan View

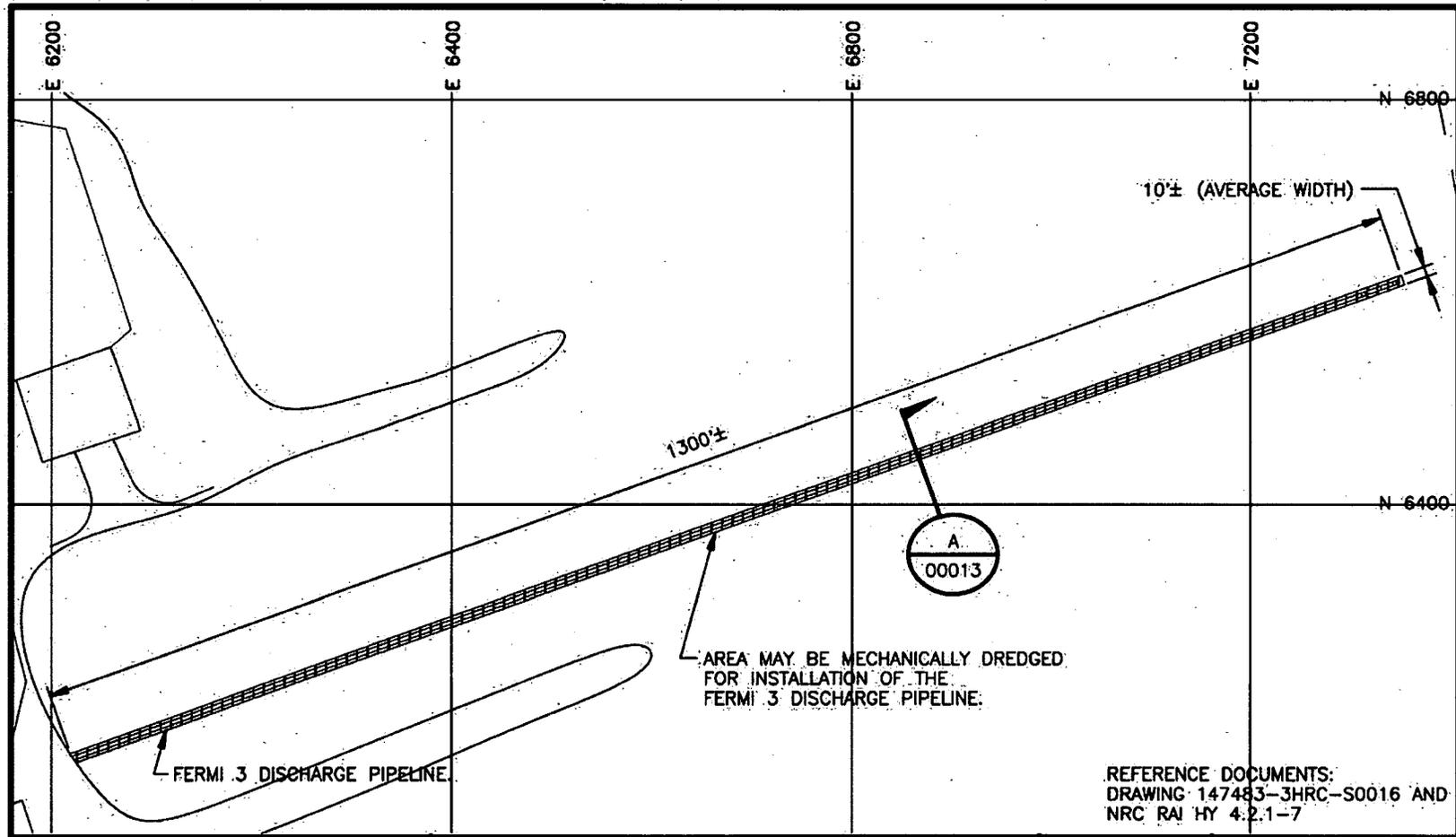


Figure 1.2-14 Fermi 3 Discharge Pipe Dredging Cross Section

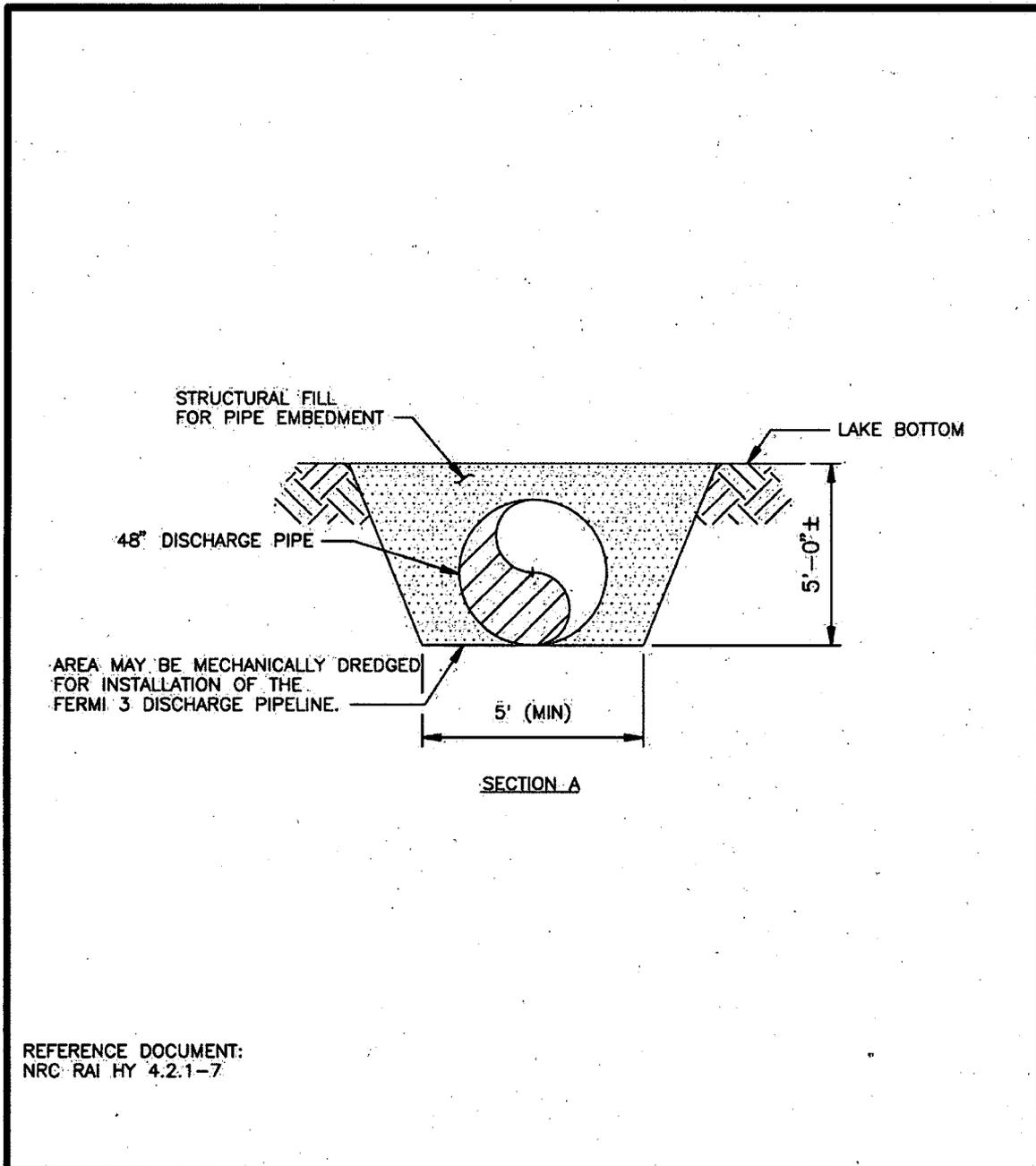


Figure 1.2-16 Fermi 3 Temporary Work Area Cross Section

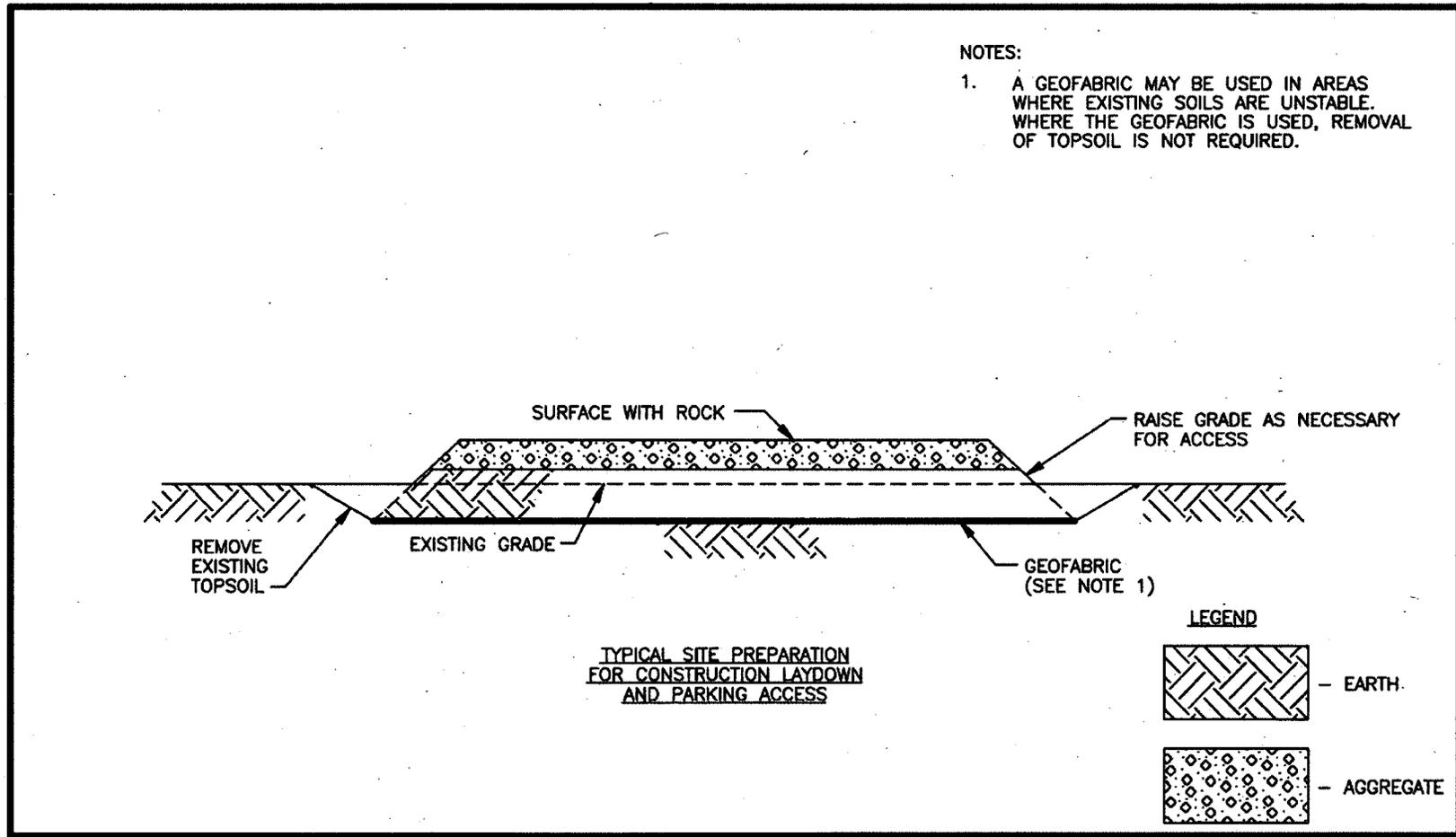


Figure 1.2-17 Fermi 3 Excavation Spoil Material Disposal Plan View

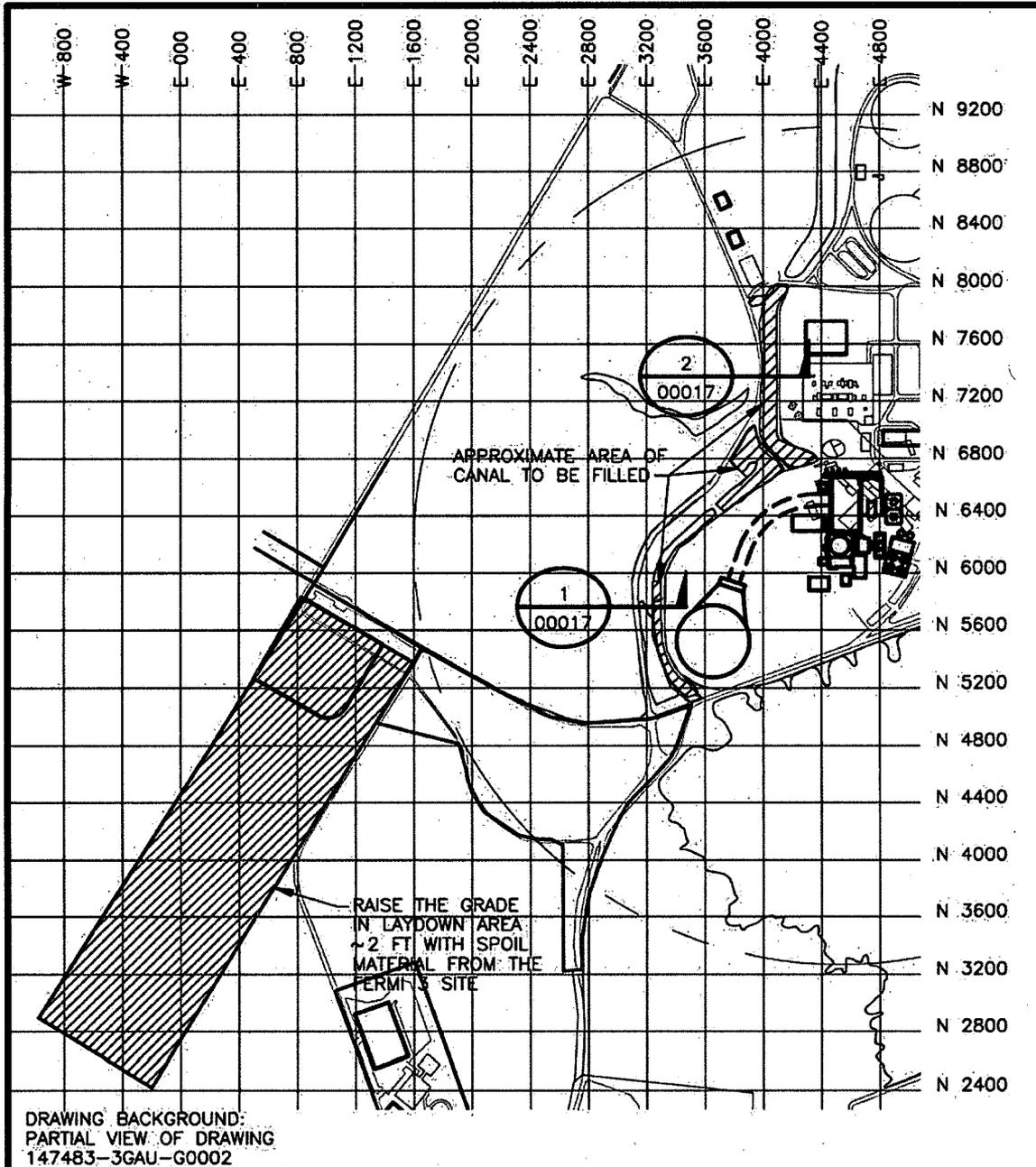


Figure 1.2-19 Fermi 3 Road Plan View

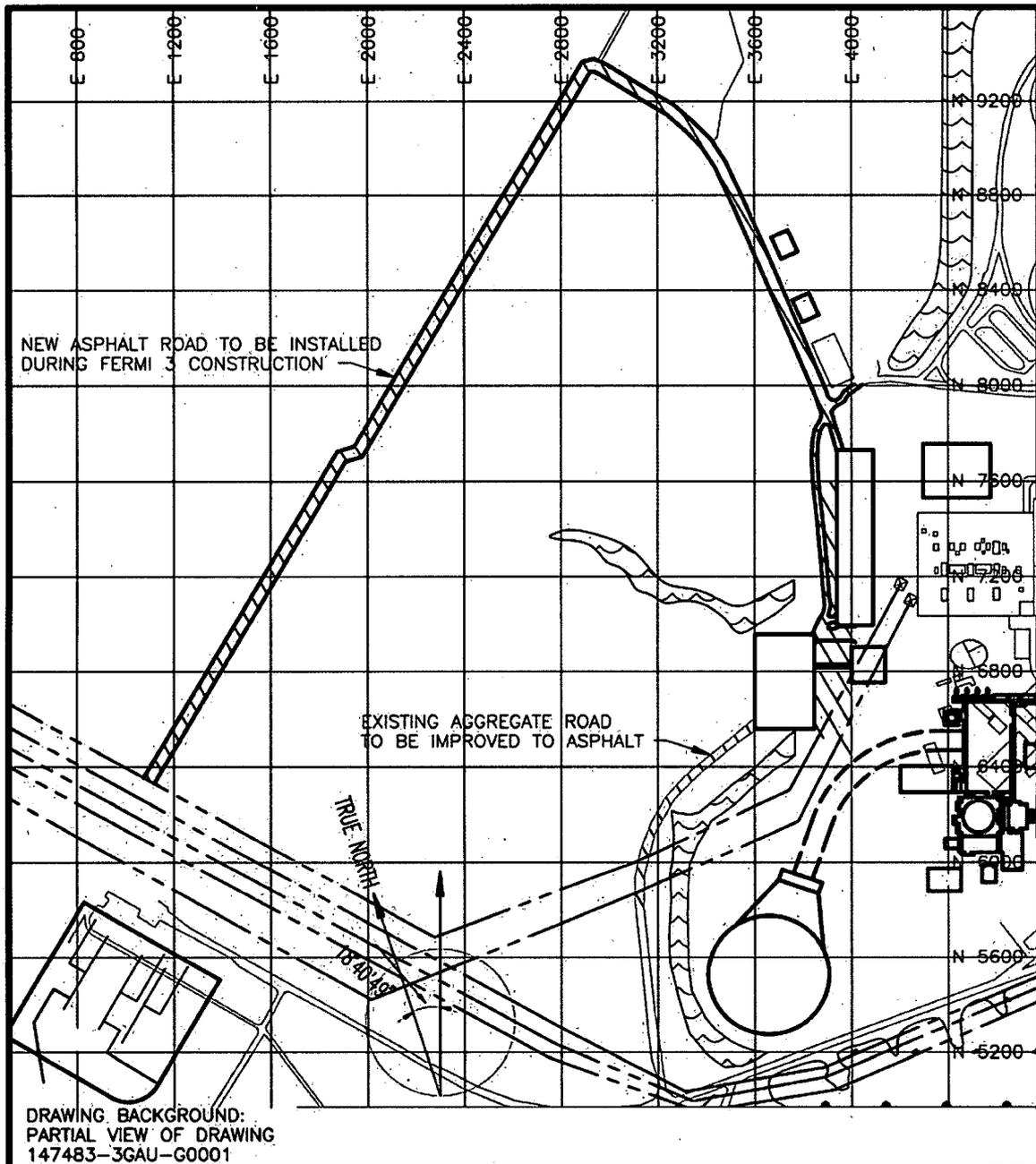


Figure 1.2-20 Fermi 3 Road Cross Sections

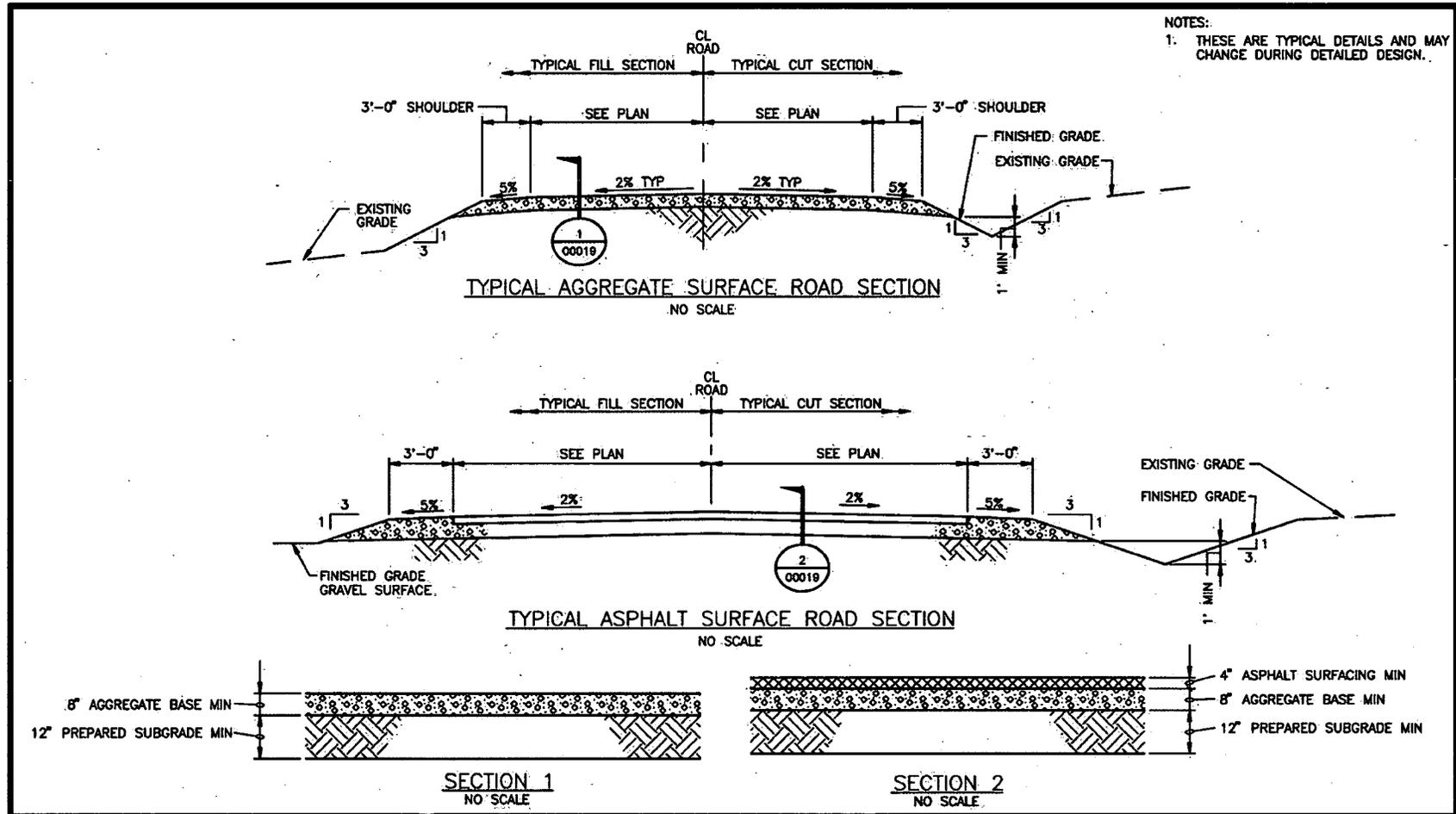
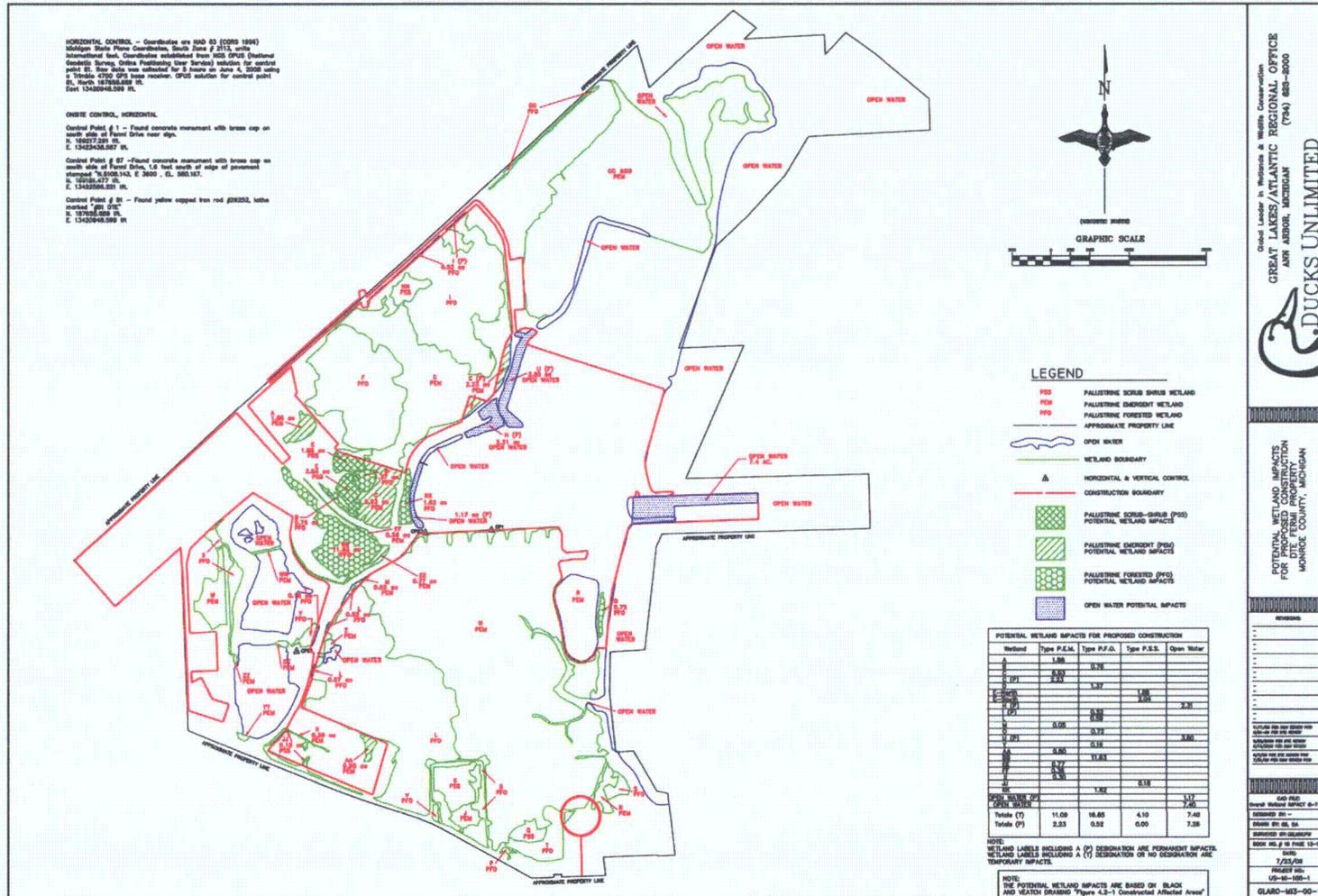


Figure 1.2-22 Potential Wetlands Construction Impacts



Chapter 2 Proposed Action and Alternatives

Chapter 2 summarizes the process used by Detroit Edison to avoid, minimize, and then mitigate unavoidable permanent impacts to waters of the United States, including wetlands as it concerns the proposed Fermi 3 project and its alternatives. Detroit Edison's site alternatives analysis and subsequent activities demonstrate the effort invested to avoid and minimize project impacts to aquatic resources and that use of the Fermi site is the least environmentally damaging practicable alternative that fulfills the project's purpose and need.

2.1 Avoidance Through the Use of Alternative Sites

The site alternatives analysis presented in the following subsections utilizes information presented in ER Section 9.3, Site Selection Process; however, the information's presentation was tailored to respond directly to the USACE RAI 2 and assist the USACE in satisfying regulatory requirements. As shown through the discussion of the site alternatives analysis contained in the following subsections and within the ER, development of Fermi 3 is the least environmentally damaging practicable project alternative for the following reasons:

- Utilization of the existing Fermi site and certain associated infrastructure features would result in the least overall environmental impacts while fulfilling the proposed project's purpose and need.
- Fermi 3 impacts would be minimized by configuring the site layout to avoid environmental disturbances to the extent feasible.
- None of the practicable alternatives reviewed would avoid discharges and emissions; all would result in other significant adverse environmental consequences.
- There is no practicable way to avoid discharges and fulfill the overall project purpose.

Subsequent subsections provide the following information regarding avoidance through the use of alternative sites in response to USACE 2-b:

- A definition of the geographic limits to search for alternative sites.
- A set of criteria to determine practicability for alternative site selection.
- The cost of creating a complete project at each site.
- A system for rating an alternative site against the criteria items and a method of comparatively weighting each rating.
- An analysis of impacts of alternative sites on USACE public interest factors, including quantification of aquatic impacts relative to the aquatic site functions and values.
- A report describing the search for the sites, their ratings, and a narrative of the rationale for selecting the proposed plans as the least environmentally damaging practicable alternative.

In general, ER Section 9.3, Site Selection Process, documents the alternative site analysis conducted to evaluate the location of the proposed Fermi 3 project. The alternative site analysis evaluated 24 potential alternative sites, including eight alternative sites. ER Section 9.1, No-Action Alternative, documents consideration of the no-action alternative.

2.1.1 Geographic Limits to Alternatives Site Search

The Detroit Edison service territory was the geographic limit of the site alternatives analysis. Refer to ER Subsection 9.3.2.1, Region of Interest (ROI)/Study Area, and associated figures for a description of and rationale for the geographic limits of the search for alternative sites.

2.1.2 Criteria Used to Determine Practicability for Alternatives Site Selection

As indicated above, ER Section 9.3, Site Selection Process, presents the site alternatives analysis completed by Detroit Edison to identify a site for the location of a new nuclear facility. That process is illustrated in ER Figure 9.3-1, Site Selection Methodology Flow Chart. The site alternatives analysis was completed using the information identified within ER Subsection 9.3.1.2, Siting Constraints and Limitations.

Sites evaluated within the site alternatives analysis included greenfield sites, brownfield sites, sites housing existing fossil fuel fired electric generating units, and sites previously licensed for the construction of nuclear facilities. These sites included offsite locations away from the Fermi 3 site, upland locations, sites without large wetland coverage or regionally rare types of wetlands, and those not owned by Detroit Edison. While sites exhibiting a variety of characteristics were considered, it was determined through completion of the site alternatives analysis that use of the alternative sites would affect multiple environmental resources in ways that would increase the overall project environmental impact at those sites compared to what would be incurred by development of the Fermi site.

As stated in ER Subsection 9.3.2.2, Potential Sites, potential sites are those sites first identified within the region of interest/study area. The potential sites were identified and evaluated based on general siting criteria. Those criteria include such aspects as those stated in ER Subsection 9.3.2.2.1.1, General Criteria for Identifying Potential Sites:

- Proximity to transmission lines.
- Proximity to rail.
- Proximity to transportation corridors.
- Proximity to water supply.
- No obvious environmental concerns (e.g., no large expanses of wetlands, no nearby natural resource conservation areas, no complex terrain, and few residences/sensitive receptors etc.).

Completion of the methodology described in ER Subsection 9.3.2.2, Potential Sites, resulted in the identification of 24 potential sites.

ER Subsection 9.3.1.1, General Process and Objective Description, states that eight candidate sites were selected from among the 24 potential sites. Candidate sites are those sites selected after screening the 24 identified potential sites through additional research and reconnaissance until it was proven that the sites were not practicable alternatives. ER Table 9.3-2, Potential Site Evaluation Summary Table, provides information documenting the potential site screening and elimination process used to identify the candidate (alternative) sites.

ER Subsection 9.3.2.3.2, Candidate Sites Evaluation Methodology, discusses the criteria-based scoring system used to evaluate the eight candidate sites. As indicated in ER Subsection 9.3.2.3.2.1, Candidate Site Scoring Methodology, two categories of detailed criteria were established – environmental and technical; a weight was assigned to each criteria category, each criterion, and subcriterion; each site was evaluated for each siting subcriterion; and then each site was ranked based on its overall numerical scores. ER Subsection 9.3.2.3.2.2, Candidate Site Scoring Criteria, defines the assigned environmental and technical criteria.

2.1.3 Cost for Creating a Complete Project at Each Site

This site alternatives analysis includes a comparison of relative costs to construct a complete nuclear unit at each alternative site through the scores given in ER Table 9.3-3, Evaluation Scores of Candidate Sites. Exact dollar costs were not tabulated for the criteria that were scored; instead, likely relative costs were compared and scored according to engineering judgment and past experience with projects on similar sites. Relative costs were estimated according to the assumption that a "non-nuclear" site (one that did not have existing nuclear developments) would have significantly higher development costs than a site with existing nuclear units because of the infrastructure and security required. Consequently, "non-nuclear" sites were allocated less favorable cost development scores.

Some of the principal site comparisons (based on estimated costs) included capital costs to prepare the site (cut/fill) and install facilities, transmission facilities, and fuel supply infrastructure. The method used to score each cost-based comparison was to assign the point value of 5 to the sites with estimated lowest costs, the value of 1 to the sites with estimated highest costs, and 3 to those sites that fell between the two extremes.

Project costs can be separated into two categories: power block capital costs and site development costs. The total power block capital costs were assumed to be the same at each alternative site. However, each site has specific characteristics that can influence the total site development costs for the proposed power generation facilities at that particular site location. These factors, which were evaluated on the basis of differentials in cost, included water supply pipelines, linear facilities, transmission lines, costs for the plant cooling system, and delivered fuel costs. Estimates of indicative unit costs (e.g., dollars per mile) were used for relative evaluations of development cost differentials.

Costs for a nuclear unit at each site were not determined, since they were assumed to be the same for each site using a standard Economic Simplified Boiling Water Reactor (ESBWR) unit. The linear facilities (electric transmission line, natural gas pipeline, water supply line) were the cost differentiators and were scored for each site, since their costs were assumed to be the determining factors in each site's overall relative cost score.

2.1.4 Alternatives Site Public Interest Factor Analysis

The site alternatives analysis documented in ER Section 9.3, Site Selection Process, assigned scores to each site based on criteria comparable to the USACE public interest factors identified in 33 CFR 320.4. So that the public interest factors being evaluated in the USACE Report can be easily compared to the criteria used in the site alternatives analysis, the USACE public interest factors, the site alternatives analysis scoring criteria (included in ER Subsection 9.3.2.3.2.2), and the locations of similar paragraph information from the alternative site profiles (included in ER Appendix 9A) are all listed below in Table 2.1-1, Site Alternatives Analysis and Comparable Public Interest Factors.

The scoring of the sites based on environmental and technical criteria constitutes a high-level impact analysis. The group of environmental criteria included, but was not limited to, the presence of wetlands, threatened and endangered species, nearby environmentally sensitive areas, and land use to ensure avoidance and minimization of as many environmental impacts as possible. The environmental criteria identified in Table 2.1-1 were investigated, evaluated, and scored for each

alternative site. ER Table 9.3-3, Evaluation Scores of Candidate Sites, provides the scoring assessed for each of the alternative sites.

2.1.5 Rating and Weighting System Used in Public Interest Factor Analysis

For information used to rate the alternative sites and the weights applied to each criterion, refer to ER Subsection 9.3.2.3.2, Candidate Sites Evaluation Methodology, and Table 9.3-3, Evaluation Scores of Candidate Sites.

As stated in ER Subsection 9.3.3, Conclusion, and shown in Table 9.3-4, Ranking of the Candidate Sites, the environmental and technical evaluation of the candidate sites rated the Fermi site as preferable when both environmental and technical scores were taken into consideration. Therefore, based on the analysis, Fermi should be the proposed site. As shown in Table 9.3-3, Evaluation Scores of Candidate Sites, the Belle River (N) site and the Greenwood Energy Center (F) site were identified as the first and second alternatives, respectively.

2.1.6 Site Alternatives Analysis Documentation

ER Subsection 9.3, Site Selection Process, include detailed information about the methods used to find potential sites, how the sites were scored and rated, and a description of the rationale used to justify selection of the proposed action (Fermi 3) as the least environmentally damaging practicable alternative. ER Subsection 9.1, No-Action Alternative, evaluates the no-action alternative.

ER Appendix 9A, Site Profiles, provides detailed site profiles, including environmental information, for the alternative sites. Additional information about potential cultural resources near the alternative sites is detailed in the response to NRC RAI CR4.1.3-3. Supplemental information about alternative Sites A and C is included in the response to NRC RAI AL9.3-1.

2.2 Minimization of Impacts at Alternative Sites

The following subsections and Appendix C provide information regarding the minimization of impacts on waters of the United States, including (1) alternative site plans at practicable alternative sites that minimize damages to wetlands, (2) the method used to estimate the environmental consequences of each plan, and (3) a narrative showing that the quantity of fill is the minimum amount practicable. Minimization is shown for each of the eight alternative sites to support the avoidance analysis.

2.2.1 Alternative Site Plans

Two site plans were typically generated for each of the alternative sites. The first site plan depicts the ESBWR Design Control Document (DCD) site layout (ESBWR DCD Plan) positioned within the site, based on engineering and constructability considerations. In some cases a second site plan was generated after consideration of potential environmental impacts arising from the DCD Plan location. This second site plan (Impact Minimization Layout) depicts a modified ESBWR DCD Plan to minimize the extent of some environmental impacts, while preserving the engineering feasibility of the selected plant layout. These site plans are shown on the following figures, which are located in Appendix C of the USACE Report:

- Figure AppC-1 – Site A ESBWR DCD Plan Layout.
- Figure AppC-2 – Site A Impact Minimization Layout.
- Figure AppC-3 – Site C ESBWR DCD Plan Layout.
- Figure AppC-4 – Site F ESBWR DCD Plan Layout.

- Figure AppC-5 – Site F Impact Minimization Layout.
- Figure AppC-6 – Site N ESBWR DCD Plan Layout.
- Figure AppC-7 – Site N Impact Minimization Layout.
- Figure AppC-8 – Site W1 ESBWR DCD Plan Layout.
- Figure AppC-9 – Site W2 ESBWR DCD Plan Layout.
- Figure AppC-10 – Site W2 Impact Minimization Site Layout.
- Figure AppC-11 – Site W3 ESBWR DCD Plan Layout.

2.2.2 Wetland Impacts and Cut and Fill Information for Each Alternative Site

A desktop review using publicly available reference information (refer to Appendix C for more information) was utilized to assess the potential impacts on wetlands and other aquatic resources and the necessary cut and fill for a new nuclear facility at the alternative sites. This analysis assessed impacts based on the ESBWR DCD Plan. Utilizing the ESBWR DCD Plan does not provide consideration for the use of offsite resources, such as lay-down areas, cooling water pipeline installation, transmission routing or switchyards, transportation access, and similar support facilities that would be required for a power plant.

Based on a review of publicly available resources, it does not appear that wetlands or other waters of the United States would be affected by construction or operational activities at the eight alternative sites. Refer to Appendix C for information on the individual sites as well as the approach used for this review.

Based on a review of Federal Emergency Management Agency (FEMA) maps, most of the alternative sites do not contain floodplains that would be affected by project activities. The exception is Site N; if construction or operational activities should occur at Site N, they may affect a small area of floodplain (based on FEMA Q3 data, the only floodplain data available for this site). The Q3 data is a scan of the original hard copy floodplain maps without base flood elevations or other engineering information. The Q3 dataset is intended for use in planning, but it has limited engineering uses. It has since been superseded by DFIRM (Digital Flood Insurance Rate Map) data in many locations, although some rural areas have yet to be updated to the current digital standard. In the latter cases, Q3 data are made available to provide a guide to likely floodplain locations, but should not be used to define floodplain boundaries for site design and related purposes. Floodplain data were not available for two sites (C and F) because of their location in communities not participating in the FEMA floodplain program. However, based on locations; topographic data; and the general absence of rivers, streams, or ditches and drains, it is believed that these sites are not in a floodplain.

Appendix C provides the following information regarding each of the alternative sites, other than Fermi:

- Narrative describing the expected wetland impacts.
- Tabular, quantitative description of wetland and cut and fill impacts.
- Figures illustrating the DCD Plan Layout and the Impact Minimization Layout.

2.3 Avoidance and Minimization of Discharges into Waters of the United States at the Fermi Site

A process to avoid, minimize, and lastly compensate for impacts to waters of the United States, including wetlands, was completed for the Fermi 3 project. This process included the consideration of alternative sites within the Detroit Edison service territory, alternative onsite locations for major structures, and changes in site configuration to minimize damages to waters of the United States.

2.3.1 Avoidance and Minimization of Discharges through Site Plan Revisions

The Fermi 3 original site plan presented in the ER was developed in 2007. It was developed without the benefit of a full wetlands delineation. That original Fermi 3 site layout would have affected 168.77 ac. of wetlands and open waters. Refer to Table 2.3-1 of the USACE Report and ER Figure 4.3-5, Potential Wetlands Construction Impacts, for additional information.

A wetlands delineation was completed for the Fermi 3 project in June 2008. Although efforts were made in the development of the original Fermi 3 site plan to avoid and minimize impacts on wetlands, waters, and the general site environment, the wetland delineation results indicated larger wetlands impacts than anticipated from the original site plan. Therefore, after the completion of the wetland delineation, Detroit Edison informed the NRC, MDEQ, and USACE that the site plan would be revised to minimize impacts on wetlands caused by the construction and operation of Fermi 3.

Through careful planning and consultation with natural resource professionals, Detroit Edison developed a Fermi 3 site plan that significantly reduced wetlands impacts to only those areas where there was no practicable way to avoid impacts, yet still fulfill the overall project purpose. The baseline and impact assessment information contained in the USACE Report was based on this revised Fermi 3 site layout. As indicated within Chapter 1; for the purposes of the USACE Report, the two site plans that have been prepared for Fermi 3 are referenced as follows: the "original site plan/layout" refers to the site plan contained within the Fermi 3 COL application submitted in September 2008; the "site plan/layout" refers to the current site plan that was revised to avoid and minimize impacts to aquatic resources. The site plan was submitted to the NRC within an August 26, 2009 letter from Detroit Edison (Reference 1.2-1). Use of the Fermi 3 site plan will result in impacts to waters of the United States as indicated in Table 2.3-2 and Figure 1.2-22, Potential Wetlands Construction Impacts, and described further in Section 4.5 of the USACE Report.

Detroit Edison achieved significant avoidance and minimization of impacts to waters of the United States through the development of the Fermi 3 site plan using the following process. The initial goal of the process was to reduce the impact on regulated wetlands caused by Fermi construction and operational activities to less than 20 ac. The wetland avoidance and minimization activities were initiated by first creating a site plan depicting an ideal site arrangement that had no impacts on regulated wetlands. In addition, overlays to the Fermi site wetland delineation were created to identify areas available for development that had no wetland impacts or low wetland impacts. Second, focus areas requiring reconfiguration of Fermi 3 related structures were identified. The focus areas consisted of those areas with the highest wetland impacts from Fermi 3 structures and activities, as depicted in the ER (e.g., cooling tower location, Fermi 2/Fermi 3 Primary Access Portal [PAP], parking, office buildings, warehousing, and shops).

Following the creation of the idealized site plan and identification of focus areas, meetings were held with technical specialists to identify the proposed changes that were not feasible. Technical considerations evaluated when developing the final site plan included, but were not limited to, the following:

- Proximity of cooling tower to safety-related structures, transmission lines, and the switchyard.

- Adequacy of area needed for construction parking and laydown.
- Location of the switchyard.
- Location and configuration of key facilities (e.g., PAP, warehouses, and shops) for security and efficiency purposes.
- Limited movement of individuals in and out of the protected area.
- Availability of sufficient facilities during both typical operations and plant outages.

As indicated, Detroit Edison has significantly reduced the expected impacts to waters of the United States through implementation of the above process. The original site plan included within the Fermi 3 ER, submitted to the NRC in September 2008, would have affected 168.77 ac. of waters of the United States (refer to Table 2.3-1). The Fermi 3 site plan analyzed within the USACE Report is expected to affect a total of 49.47 ac. of waters of the United States (39.44 ac. of temporary impacts and 10.03 ac. of permanent impacts [this total includes 2.23 acres of palustrine emergent wetland (PEM), 0.52 acre of palustrine forested wetland (PFO) and 7.28 acres of open water]); refer to Table 2.3-2 and Figure 1.2-22). This is a 119.30 ac. reduction in impacts to waters of the United States.

2.3.2 Cut and Fill Information for the Fermi Site

The existing grade of the Fermi site is Elevation 582 feet (NAVD 88). Surface fill is to be placed onsite in areas such as the onsite canals and power block area. The power block area will be raised to Elevation 589 feet (NAVD 88). The following describes the rounded, approximate volumes of excavation and backfill material for the Fermi 3 original site plan, as presented in the Fermi 3 ER, and the site plan. The volumes were rounded to establish an order of magnitude estimate for the anticipated excavation and backfill volumes.

The approximate volumes of excavation and backfill material for use at the Fermi 3 site, based on the site arrangement provided in the Fermi 3 ER, are summarized in Table 2.3-3. The excavation and backfill volumes contained within this table are anticipated for the construction of the power block structures. This is similar to the analysis conducted for each of the alternative sites, as discussed in Subsection 2.2.2 and further identified in Appendix C.

Table 2.3-4 provides the approximate volumes of excavation and backfill material for use at the Fermi 3 site, based on the site arrangement. The excavation and backfill volumes contained within Table 2.3-4 are anticipated for the construction of the power block structures and cooling tower at the Fermi site. This was a more detailed analysis than that conducted for the Fermi 3 original site plan provided in the September 2008 ER and the alternative site plans.

A review of Tables 2.3-3 and 2.3-4 allows a comparison of the expected cut and fill requirements associated with the Fermi 3 arrangements.

2.4 Compensation

The following subsections describe the Conceptual Wetlands Mitigation Plan (Conceptual Mitigation Plan) provided to the NRC in response to NRC RAI TE4.3.1-4 and discuss special practices and conditions proposed by Detroit Edison to minimize project impacts. The subsections below and the referenced Conceptual Mitigation Plan identify practicable steps to achieve functional replacement of unavoidable loss of aquatic resources through the creation or restoration of the affected area.

2.4.1 Compensation for Discharges into Waters of the United States, including Wetlands, on the Fermi Site

As discussed in Section 2.3 of the USACE Report, compensatory mitigation for disturbances to wetlands was the final alternative considered by Detroit Edison. The Conceptual Mitigation Plan provided in response to NRC RAI TE4.3.1-4 was developed to address unavoidable permanent wetlands losses and was based on existing available data, a site visit to the Fermi site, a wetlands delineation, and functions and values assessment. It was also developed using Ducks Unlimited's knowledge of the local watershed and the conservation potential of various habitats in this area for successful wetland conservation projects. The Conceptual Mitigation Plan includes the following, in addition to other information, proposed compensation for unavoidable, long-term (permanent) impacts to waters of the United States, including wetlands.

The Conceptual Mitigation Plan identifies opportunities for onsite and offsite protection, restoration, creation, and enhancement of a mix of PEM, palustrine scrub-shrub (PSS) wetlands, and PFO wetlands. These activities are expected to result in wetlands of equal or greater value than those affected by Fermi 3 activities. The Conceptual Mitigation Plan proposes the restoration or development of compensatory wetlands at a mitigation ratio to be approved by the associated regulatory agencies. The mitigation design will emphasize diversity in habitat structure, plant species diversity, and hydrologic parameters that optimize the ecological condition of the mitigation wetlands.

The Conceptual Mitigation Plan does not provide compensatory mitigation for those wetlands temporarily affected by Fermi 3 construction and operational activities. The majority of the construction impacts from Fermi 3 activities on waters of the United States will be temporary impacts. As indicated in ER Subsection 4.3.1.1.1, Vegetation on the Site and in the Vicinity, as revised by NRC RAI GE3.1-1, and in the Conceptual Mitigation Plan, wetlands temporarily affected by Fermi 3 construction activities would be restored to preconstruction conditions. When construction activities begin, vegetation within the temporarily affected wetlands will be removed, and the top six to 12 inches of topsoil will be stripped, stockpiled and covered or seeded. Upon completion of construction, any impervious surfaces or fill installed for construction within these areas would be removed. The previously stockpiled topsoil will be replaced to their preconstruction contours and elevations. These areas would be seeded and/or planted with native trees, shrubs, and herbaceous plants similar to those present before construction. An enhanced planting mix may be used in situations where the preconstruction vegetation was dominated by undesirable species. The restored wetlands are expected to have an improved plant species composition that should, in turn, provide enhanced wildlife habitat by providing improved forage and shelter for wildlife in the area. Through restoration, preexisting functions and values would be returned to the preconstruction conditions as much as practicable.

The current mitigation plan is conceptual in nature. A final design and mitigation plan will be developed and implemented, in accordance with regulatory guidance (e.g., USACE Checklist for Preparing Compensatory Mitigation Plans for the Detroit District), after Detroit Edison and the associated regulatory agencies agree to an acceptable mitigation site and the design concept.

2.4.2 Special Practices or Conditions Proposed to Minimize Detrimental Project Effects

As discussed in the previous subsections of the USACE Report, Detroit Edison successfully implemented a planning process to avoid, minimize, and then compensate for unavoidable, permanent impacts on waters of the United States, including wetlands resulting from the construction and operation of Fermi 3. As stated in ER Section 1.2, Status of Review, Approvals, and Consultations, Detroit Edison will obtain the necessary authorizations prior to initiating the regulated activities associated with the construction and operation of a new unit. Detroit Edison's compliance with associated permit conditions and implementation of associated plans (e.g., Soil Erosion and Sedimentation Control [SESC] Plan, Storm Water Pollution Prevention Plan [SWPPP], and

Compensatory Mitigation Plan) will afford further appropriate and practicable environmental protection. Therefore, special practices or conditions, aside from those discussed within the USACE Report, the ER, and responses to NRC RAIs are not requested or offered by Detroit Edison at this time.

**Table 2.1-1 Site Alternatives Analysis and Comparable Public Interest Factors
 (Page 1 of 2)**

Public Interest Factor¹	Site Alternative Analysis Scoring Criteria Counterpart²	Alternative Site Profile Headings with Associated Information³
Conservation	Land Use Existing Land Use Ecology/Natural Resources Impacts on Designated Scenic, Natural, Recreational, or Wildlife Areas	Environmentally Sensitive Areas Ecology Vegetation Wildlife
Economics	Socioeconomics Socioeconomic Resources	Socioeconomics
Aesthetics	Socioeconomics Visual Impact	Buffer Area
General Environmental Concerns	Potential for Hazardous Material Contamination Geologic/Seismic Activity	Water Source Ecology Environmentally Sensitive Areas Cultural Resources Socioeconomics Contamination Security Waste Disposal
Wetlands	Ecology/Natural Resources Wetlands/Waters of the United States	Ecology Wetlands
Historic Properties	Socioeconomics Cultural Resources	Cultural Resources
Fish and Wildlife Values	Ecology/Natural Resources Documented Threatened and Endangered Species Habitat Disruption	Ecology Wildlife Threatened, Endangered, and Otherwise Protected Species
Flood Hazards	Site Development Flood Potential	Location
Floodplain Values	Site Development Flood Potential	Location
Land Use	Land Use Existing Land Use Nearby Airports Buffer between Facility and Receptors	Land Use/Ownership Existing Facilities
Navigation	Land Use Existing Land Ownership	No associated write-up
Shore Erosion and Accretion	Ecology/Natural Resources Water Quality	No associated write-up
Recreation	Land Use Existing Land Use	Environmentally Sensitive Areas
Water Supply and Conservation	Site Development Groundwater Construction Impacts Water Resources Adequacy of Water Source for Baseload Plant Distance to Adequate Source of Water	Water Source Groundwater Supply Surface Water Wastewater Discharge

**Table 2.1-1 Site Alternatives Analysis and Comparable Public Interest Factors
 (Page 2 of 2)**

Public Interest Factor¹	Site Alternative Analysis Scoring Criteria Counterpart²	Alternative Site Profile Headings with Associated Information³
Water Quality	Ecology/Natural Resources Impacts on Water Quality Water Resources – Development Groundwater Quality Makeup Water Quality	Water Source Groundwater Supply Surface Water
Energy Needs	Site Development Utility Displacement/Replacement Cogeneration Potential	No associated write-up
Safety of Impoundments	Site Development Geologic/Seismic Activity	No associated write-up
Mineral Needs	Site Development	No associated write-up
Consideration of Property Ownership	Land Use Existing Land Ownership	Land Use/Ownership Site Acreage/Topography
General Needs and Welfare of the People	Socioeconomics Noise Impact	Water Source Ecology Environmentally Sensitive Areas Cultural Resources Socioeconomics Contamination Security Waste Disposal
Food and Fiber Production	Land Use Existing Land Use (within one mi.)	Ecology Vegetation

¹ USACE public interest factors identified in 33 CFR 320.4

² Site alternatives analysis scoring criteria included in ER Subsection 9.3.2.3.2.2.

³ Locations of paragraph information on similar topics from the alternative site profiles included in ER Appendix 9A, Site Profiles.

Table 2.3-1 Potential Fermi 3 Construction Impacts to Waters of the United States Resulting from the Fermi 3 Original Site Plan

Wetland Type	Acreage of Impact
PEM	49.49
PFO Wetland	96.83
PSS Wetland	7.04
Open Water	15.41
Total	168.77

Source: ER Figure 4.3-5, Potential Wetlands Construction Impacts.

Table 2.3-2 Potential Wetlands Construction Impacts Resulting from the Fermi 3 Site Plan

Wetland Type	Acreage of Temporary Impact	Acreage of Permanent Impact
PEM	11.09	2.23
PFO Wetland	16.85	0.52
PSS Wetland	4.10	0
Open Water	7.4	7.28
Total	39.44	10.03

Source: Figure 1.2-22, Potential Wetlands Construction Impacts.

Table 2.3-3 Approximate Volumes for Excavation and Backfill based on Fermi 3 Original Site Plan

Excavation	Rounded Excavation Volume (cubic yards [cu yd.])	Fill	Rounded Fill Volume (cu yd.)
Soil Excavation	335,000	Additional Surface Fill Material	260,000
Rock Excavation	75,000	Building Volume Below Grade	220,000
Total Excavation	410,000	Total Backfill ¹	450,000

1. Total backfill equals the volume of surface fill plus the volume of excavation minus the volume of buildings.

Table 2.3-4 Approximate Volumes for Excavation and Backfill based on Fermi 3 Site Plan

Excavation	Rounded Excavation Volume (cu yd.)	Fill	Rounded Fill Volume (cu yd.)
Soil Excavation	420,000	Additional Surface Fill Material	265,000
Rock Excavation	75,000	Building Volume Below Grade	355,000
Total Excavation	495,000	Total Backfill	405,000
Unusable Soil (Spoils) ¹	265,000	Lean Concrete	40,000
Total Usable Excavation	230,000	Total Imported Fill Material	175,000

1. Subsurface materials classified as lacustrine deposits and glacial till are not suitable for backfill material around safety-related structures and components.

Chapter 3 Environmental Setting of the Fermi Site (Baseline Conditions)

The information provided within the following subsections establishes a baseline environmental setting from which to assess the impact of the activities associated with the construction and operation of Fermi 3.

3.1 Introduction

Chapter 3 describes the affected environment for the proposed Fermi 3. The baseline information provided regarding the affected environment pertains to the Fermi site, the vicinity, and the region around it, as well as the associated resources potentially directly or indirectly affected by the use of the Fermi site for the construction and operation of Fermi 3. Descriptions of the affected environments for other alternatives are included within ER Appendix 9A.

3.1.1 Chapter Organization

Chapter 3 first presents a brief description of the Fermi site, and then describes the resources associated with each public interest factor outlined in 33 CFR 320.4 "General Policies for Evaluating Permit Applications." The majority of the descriptive, baseline information contained within Chapter 3 of the USACE Report was provided in the Fermi 3 COL application; therefore, many of the following sections identify the relevant sections, tables, and figures of the ER that provide baseline descriptions of the associated public interest factor.

3.2 General Description of Project Area

As stated in ER Subsection 1.1.2, Site Location, the proposed location of Fermi 3 is the Fermi site in eastern Monroe County, Michigan. The Fermi site consists of approximately 1,260 ac. and is situated along the western shoreline of Lake Erie. Refer to the following ER figures, which have been revised by NRC RAI GE3.1-1, for additional general information regarding the Fermi site and the proposed Fermi 3 project:

- Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1.
- Figure 2.1-4, Fermi 3 Site Plan, as revised by NRC RAI GE3.1-1.

Refer to ER Section 2.2, Land, Subsections 3.1.1, Existing Fermi Site Description and 2.2.2, Transmission Corridors and Offsite Areas, for a general description of the Fermi site, offsite transmission corridors and the surroundings. Specifically, the Fermi site and its vicinity are described in ER Subsection 2.2.1, The Site and Vicinity, and the 50-mi. region is discussed in ER Subsection 2.2.3, The Region.

3.3 Conservation and Overall Ecology

This section provides regional and Fermi site-specific baseline information regarding conservation and overall ecology. For the purposes of the USACE Report, conservation is defined as "[t]he protection, preservation, management, or restoration of natural environments and the ecological communities that inhabit them. Conservation is generally held to include the management of human use of natural resources for public benefit and sustainable social and economic utilization" (Reference 3.3-1). The following discussion addresses conservation and overall ecology, with a focus on the following ecological aspects of the Fermi site and vicinity:

- Areas with Natural Heritage Value.

- Federal and State Threatened and Endangered Species.
- Migratory Birds.
- Wetlands.
- Floodplains.
- Fish Spawning or Cover Areas.

Refer to ER Section 2.4, Ecology, for a description of the terrestrial and aquatic environments and the biota of the Fermi vicinity and offsite areas, and the responses provided to NRC RAI TE2.4.1-2 and NRC RAI AE2.4.2-2 for reports respectively documenting terrestrial and aquatic surveys of the Fermi site. Refer to ER Subsection 2.4.1.9, Transportation Corridors and Offsite Areas, for a description of terrestrial and aquatic environments associated with the offsite transmission corridors.

ER Subsection 2.4.1, Terrestrial Ecology, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10, and Subsection 2.4.2, Aquatic Ecology, as revised by NRC RAI AE2.4.2-2 and NRC RAI AE2.4.2-3, respectively, identify and describe the terrestrial and aquatic species composition, spatial and temporal distribution, abundance, and other structural or functional attributes of biotic assemblages that could be affected by Fermi 3. These ER subsections identify important terrestrial and aquatic natural resources, as well as wildlife sanctuaries, preserves, and other natural areas that may be affected. Refer to ER Subsections 2.4.1.9.1, Vegetation; 2.4.1.9.2, Wildlife; 2.4.1.9.3, Important Species; and 2.4.1.9.4, Important Habitats, respectively, for information on these resources in the offsite transmission corridors.

3.3.1 Regional Overview

The following subsections provide conservation and overall ecological information regarding the region around the Fermi site. The regional information identifies areas with natural heritage value, federal and state listed threatened and endangered species, migratory birds, wetlands, floodplains, and fish spawning or cover areas.

3.3.1.1 Areas with Natural Heritage Value

For the purposes of the USACE Report, the World Heritage Convention's definition of natural heritage has been used. The United States ratified the World Heritage Convention on July 12, 1973 (Reference 3.3-2). The World Heritage Convention defines natural heritage as follows:

"Natural features, consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;

Geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation; and,

Natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation, or natural beauty" (Reference 3.3-3).

None of the natural properties inscribed on the World Heritage List, or submitted on the tentative list, are located within the state of Michigan (Reference 3.3-4). Although the state of Michigan does not contain natural properties listed on the World Heritage List, the region surrounding the Fermi site includes areas exhibiting elements of the natural heritage definition. ER Table 2.2-9, Recreation

Areas in the Fermi Region, lists areas within the region around the Fermi site likely to exhibit qualities associated with natural heritage. The following are examples of the types of areas within 50 mi. of the Fermi site likely to be considered as exhibiting qualities associated with natural heritage: wildlife refuges, nature reserves, state parks, recreation areas, conservation areas, and a Canadian national park. ER Figure 2.5-16, Natural, Public, and Recreation Areas within the 50-mi Region, illustrates the locations of multiple areas likely to exhibit values associated with natural heritage within the 50-mi. region surrounding the Fermi site.

3.3.1.2 Federal and State Threatened and Endangered Species

Refer to ER Subsection 2.4.1.2.1, Federal Protected Species, for information regarding terrestrial species protected under the Endangered Species Act of 1973 (ESA) on or in the vicinity of the Fermi site. Refer to ER Subsection 2.4.1.9.3, Important Species, for information regarding terrestrial protected species on or near the offsite transmission corridors. According to the U.S. Fish & Wildlife Service (USFWS), the project occurs within the potential range of some federally listed species; however, the USFWS had no records of the occurrence of these species, nor were there any designated critical habitats in the area. Refer to ER Subsection 2.4.1.2.2, State-Listed Protected Species, for a discussion of state listed threatened and endangered animals and plants in and around the project area.

State and federally listed threatened and endangered aquatic species located within a 50-mi. radius of the Fermi site are identified in ER Table 2.4-15, Threatened and Endangered Fish and Mollusk Species Within a 50-Mile Radius of the Fermi Site. Refer to ER Subsection 2.4.2.4, Threatened and Endangered Aquatic Organisms, for a discussion of federal or state listed threatened and endangered aquatic species in Michigan, Ohio, and Ontario with the potential to be affected by construction and/or operational activities at the Fermi site. ER Appendix 2B, Life Histories of Threatened and Endangered Species, provides detailed life history information on each of the species listed within ER Table 2.4-15.

3.3.1.3 Migratory Birds

Refer to ER Subsection 2.4.1.1.2, Wildlife on the Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10, for a discussion of birds within the region, including transient birds that stop briefly at the Fermi site during migration. Refer to ER Subsection 2.4.1.9.2, Wildlife, for information regarding migratory birds potentially using the transmission corridors.

3.3.1.4 Wetlands

Refer to Section 3.6 of the USACE Report for baseline information regarding wetlands within the region. Refer to ER Subsection 2.4.1.9.4, Important Habitats, for information regarding wetlands and other aquatic habitats along the transmission corridors.

3.3.1.5 Floodplains

Refer to Section 3.12 of the USACE Report for baseline information regarding flood hazards and floodplain values.

3.3.1.6 Fish Spawning or Cover Areas

As stated in ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats, wetland habitats along the shoreline of Lake Erie are essential to aquatic species because of the spawning and feeding grounds that they can provide.

Refer to ER Appendix 2A, Life Histories of Aquatic Species, for detailed species-specific information on important species, as defined by Standard Review Plans for Environmental Reviews for Nuclear Power Plants (NUREG-1555), in aquatic ecosystems within the vicinity of the Fermi site. The life histories within ER Appendix 2A, Life Histories of Aquatic Species, provide information on spawning areas, nursery grounds, food habits, feeding areas, wintering areas, and migration routes.

Refer to ER Appendix 2B, Life Histories of Threatened and Endangered Species, for detailed life history information on each of the species listed in ER Table 2.4-15, Threatened and Endangered Fish and Mollusk Species Within a 50-Mile Radius of the Fermi Site. The life histories given in ER Appendix 2B provide information on topics such as spawning areas, nursery grounds, food habits, and feeding areas.

3.3.2 Project Area Overview

The following subsections provide conservation and overall, general ecological information regarding the Fermi site. The site-specific information identifies areas with natural heritage value, federal and state listed threatened and endangered species, migratory birds, wetlands, floodplains, and fish spawning or cover areas.

3.3.2.1 Natural Heritage

As indicated in Subsection 3.3.1.1 of the USACE Report, areas exhibiting natural heritage values include those with unique natural features, areas supporting the habitat of threatened species, or areas possessing scientific or aesthetic values.

As indicated in ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, the majority of the undeveloped Fermi site is part of the Detroit River International Wildlife Refuge (DRIWR). The cooperative management agreement entered into between Detroit Edison and the USFWS allows the USFWS to protect and manage wildlife and fish populations on 656 ac. of the Fermi site (Reference 3.3-5).

Refer to ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1 and Subsection 2.4.2.2, Aquatic Communities, for additional information regarding the DRIWR and the cooperative agreement between Detroit Edison and the USFWS. Refer to ER Figure 2.4-6, Boundaries of the Detroit River International Wildlife Refuge, Lagoon Beach Unit, Monroe County, MI, for an illustration of the extent of the DRIWR on the Fermi site. As stated in ER Subsection 2.4.1.2.3, Habitats, the public does not have access to the DRIWR unit located on the Fermi site without the permission of the USFWS and Detroit Edison.

Refer to ER Subsection 2.2.3.4, Regional Natural and Recreation Areas, for a discussion of areas likely to exhibit natural heritage value near the offsite transmission corridors.

3.3.2.2 Federal and State Protected Species

In 2007, Detroit Edison consulted with the USFWS, the Michigan Department of Natural Resources (MDNR) Natural Heritage Program, and the Michigan State University Extension Michigan Natural Features Inventory program regarding the occurrence or potential occurrence of federal and state protected species and sensitive habitats on or in the vicinity of the Fermi site. Refer to ER Section 1.2, Status of Review, Approvals, and Consultations; Subsection 2.4.1.2.1, Federal Protected Species; Subsection 2.4.1.2.2, State-Listed Protected Species; and Subsection 4.3.1.4, Regulatory Consultation, for a discussion of those consultations. Refer to the NRC RAI TE2.4.1-3 response to obtain copies of all correspondence with regulatory, natural heritage programs and wildlife agencies. Refer to the NRC RAI AE2.4.2-1 response to obtain copies of correspondence with

federal and state agencies regarding potential impacts on aquatic species and monitoring studies for Fermi 3.

Refer to ER Subsection 2.4.2.9.5, Regulatory Consultation and 4.3.2.3.5, Regulatory Consultation, for information regarding the occurrence or potential occurrence of federal and state protected species and sensitive habitats on or near the transmission corridors.

Terrestrial Federal and State Protected Species

ER Subsection 2.4.1.2.1, Federal Protected Species, states that the USFWS was consulted concerning the occurrence or potential occurrence of species on or in the vicinity of the Fermi site that are protected under the ESA. ER Subsection 2.4.1.2.1 also provides information regarding the presence of the bald eagle, which is afforded protections under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act, and the Indiana bat, a federally endangered species. Refer to the NRC RAI TE2.4.1-2 response for the confirmatory terrestrial ecology survey report that provides additional information regarding species at the Fermi site.

Refer to ER Subsections 2.4.1.9.3, Important Species and 2.4.2.9.2, Important Species, for information regarding the occurrence or potential occurrence of protected species in or near the transmission corridors.

ER Subsection 2.4.1.2.2, State-Listed Protected Species, provides information concerning the state listed threatened and endangered animals and plants in and around the project area. Species were identified through consultation with the MDNR and the Michigan Natural Features Inventory. Eight state protected terrestrial species were identified as occurring or potentially present on the Fermi site. These terrestrial species include the following:

- Bald eagle (*Haliaeetus leucocephalus*).
- Indiana bat (*Myotis sodalist*).
- Barn owl (*Tyto alba*).
- Common tern (*Sterna hirundo*).
- Eastern fox snake (*Pantherophis gloydi*).
- American lotus (*Nelumbo lutea*).
- Arrowhead (*Sagittaria montevidensis*).
- Franks sedge (*Carex frankii*).

While the MDNR commented on the bald eagle and Franks sedge, on April 9, 2009, the updated Michigan endangered species list went into effect and both species were delisted (Reference 3.3-6). Delisting removes the protections that Michigan previously provided for the bald eagle, as described in ER Subsection 2.4.1.2.2.1, Animals. The bald eagle remains protected under two federal statutes, the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Franks sedge is no longer protected under either federal or state law.

Additional field studies conducted at the Fermi site in 2008 and 2009 determined that the eastern fox snake and the American lotus are the only state protected threatened and endangered species present at the site. Refer to the response to NRC RAI TE2.4.1-2 for the terrestrial ecology surveys documenting the terrestrial wildlife and vegetation at the Fermi site.

Refer to the following responses to NRC RAIs for maps regarding the locations of protected species on the Fermi site:

- NRC RAI TE2.4.1-8 response provides the location of an anecdotal fox snake sighting.
- NRC RAI TE2.4.1-7 response provides the location of an onsite bald eagle nest.
- NRC RAI TE2.4.1-10 response provides the locations of any protected species observed during planned field observations during 2008 and 2009.

Aquatic Federal and State Protected Species

Information regarding federally and state protected aquatic species in the project area can be found in the following documents:

- ER Subsection 2.4.2.4, Threatened and Endangered Aquatic Organisms, and the associated table and ER Appendix 2B. The discussion includes statements regarding threatened and endangered aquatic organisms within the Western Basin of Lake Erie and other aquatic habitats within and near the Fermi site.
- ER Subsection 5.3.1.2.3, Principal Aquatic Resources, provides additional information regarding the potential occurrence of threatened and endangered aquatic species on or near the Fermi site.
- NRC RAI AE2.4.2-2 response, which provides additional supporting statements that federal and state listed threatened and endangered aquatic species have not been observed in the vicinity of the Fermi site.

Migratory Birds

Refer to ER Subsection 2.4.1.2.1, Federal Protected Species, for a discussion of the Migratory Bird Treaty Act and the migratory species potentially on the Fermi site or in its vicinity. ER Subsection 2.4.1.2.1 also discusses the presence of the bald eagle on the Fermi site and the protections afforded it under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

As stated in ER Subsection 2.4.1.1.2, Wildlife on the Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10, birds within the Fermi region include year-round residents, seasonal residents, and transients (birds stopping briefly during migration). The Fermi site lies on the western shore of Lake Erie and is within the Atlantic flyway, which is one of several major migratory flyways in North America. Refer to ER Subsection 2.4.1.1.2, Wildlife on the Site and Vicinity, and Subsection 2.4.1.2.1, Federal Protected Species, for a complete discussion of bird species that have been observed on the Fermi site or in its vicinity. Also refer to the NRC RAI TE2.4.1-2 response for the confirmatory terrestrial ecology survey report that provides additional information regarding species at the Fermi site, including migratory birds. Refer to ER Subsection 2.4.1.9.2, Wildlife, for information regarding migratory birds in the offsite transmission corridors.

3.3.2.3 Wetlands

Refer to Section 3.6 of the USACE Report for baseline information regarding wetlands within the Fermi site. Refer to the ER Subsections 2.4.1.9.4, Important Habitats and 2.4.2.9.3, Important Habitats, for information regarding for information regarding wetlands and other aquatic habitats in the transmission corridors.

3.3.2.4 Floodplains

Refer to Section 3.12 of the USACE Report for baseline information regarding the floodplain associated with the Fermi site.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for information on floodplain impacts related to the transmission corridors.

3.3.2.5 Fish Spawning or Cover Areas

Refer to ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats; ER Appendix 2A, Life Histories of Aquatic Species; and ER Appendix 2B, Life Histories of Threatened and Endangered Species, for site-specific information regarding potential fish spawning and cover areas on the Fermi site and its vicinity. The NRC RAI AE2.4.2-2 response further identifies the aquatic habitat features in the vicinity of the Fermi site.

3.3.3 References

- 3.3-1 *American Heritage Science Dictionary*, Houghton Mifflin Company, http://books.google.com/books?id=yKUagx8PB_EC&pg=PA140&dq=american+science+dictionary+conservation&ei=i9h5SoTrHY2EzAS3q6jgDA#v=onepage&q=&f=false, accessed 5 August 2009.
- 3.3-2 United Nations Educational, Scientific, and Cultural Organization, *States Parties: Ratification Status*, <http://whc.unesco.org/pg.cfm?cid=246>, accessed 28 July 2009.
- 3.3-3 United Nations Educational, Scientific, and Cultural Organization, *UNESCO World Heritage Convention*, <http://whc.unesco.org/en/conventiontext/>, accessed 28 July 2009.
- 3.3-4 United Nations Educational, Scientific, and Cultural Organization, *The States Parties: United States of America*, <http://whc.unesco.org/en/statesparties/us>, accessed 28 July 2009.
- 3.3-5 Detroit Edison, *Conservation Programs and Partners*, <http://www.dteenergy.com/dteEnergyCompany/environment/conservation/programs.html>, accessed 29 July 2009.
- 3.3-6 Michigan Department of Natural Resources, *Frequently Asked Questions The 2009 Revision of the State Endangered Species List*, http://www.michigan.gov/dnr/0,1607,7-153-10370_12141-213610--,00.html, accessed 28 July 2009.

3.4 Economics

This section provides baseline information regarding the economic characteristics of the region and local community surrounding the Fermi site.

3.4.1 Regional Overview

Refer to ER Subsection 2.5.2.1, Area Economic Base, as revised by NRC RAI SE2.5.2-1 and NRC RAI SE2.5.2-2 for a description of the region's economic base.

Refer to the responses to the following NRC RAIs to obtain baseline socioeconomic information about the region surrounding the Fermi site:

- NRC RAI SE2.5.2-1 provides information regarding the size and nature of the heavy construction industry and construction labor force within the region specific to the job categories that would be used to support Fermi 3 construction.
- NRC RAI SE2.5.2-3 provides updated housing estimates and projects.

3.4.2 Economics of the Local Community

The following subsections provide information regarding employment, tax revenues, community services, property values, and environmental justice around the Fermi site.

3.4.2.1 Employment

Refer to ER Subsection 2.5.2.1, Area Economic Base, as revised by NRC RAI SE2.5.2-1 and NRC RAI SE2.5.2-2 and Subsection 2.5.2.4, Social Structure, and their associated tables, for employment information.

Refer to the response to NRC RAI SE4.4.2-5 for information regarding the existing Fermi 2 workforce data by zip code.

3.4.2.2 Tax Revenues

Refer to ER Subsection 2.5.2.2.2, Taxation, and its associated tables, to obtain tax information regarding Monroe County and Frenchtown Charter Township. Frenchtown Charter Township and Monroe County were the focus of the subsection because they would be the primarily affected area and would likely receive the majority of the tax benefits generated by Fermi 3.

3.4.2.3 Community Services

Refer to ER Subsection 2.5.2.6, Educational System and its associated tables, for a description of the Monroe County educational system. The NRC RAI SE4.4.2-1 response provides copies of all correspondence and documentation of personal communications used to support the education analysis within the ER.

Refer to ER Subsection 2.5.2.7, Public and Private Recreational Facilities, for a description of the recreational opportunities within the vicinity of the Fermi site.

Refer to ER Subsection 2.5.2.9, Social Services and Public Facilities and the associated tables and figures for a description of the water and sewer services, police service, fire protection service, community emergency planning, and hospital and ambulance services. The NRC RAI SE4.4.2-2 response provides copies of all correspondence and documentation of personal communications used to support analysis of public safety and social services within the ER.

Refer to ER Subsection 2.5.2.10, Transportation System, for a description of the transportation network in the 50-mi. Fermi region. That network includes a system of highways, public transportation, airports, ports, and railways.

3.4.2.4 Property Values

Refer to ER Subsection 2.5.2.2.2, Taxation, and the following ER tables for information regarding the leading property taxpayers in Monroe County (Michigan) in 2006 and 1997, and the largest taxpayers for Wayne County (Michigan) and Lucas County (Ohio):

- Table 2.5-31, Monroe County's Largest Property Tax Payers.
- Table 2.5-32, Charter County of Wayne Principal Property Taxpayers (Fiscal Year 2007).
- Table 2.5-33, Lucas County Top Ten Private Sector Principal Tax Payers, December 31, 2006 (Amount's in 000's).

3.4.2.5 Environmental Justice

Refer to ER Subsection 2.5.4, Environmental Justice and the associated tables and figures, for descriptions of the low-income, minority, and migrant labor populations within the area surrounding the Fermi site. The NRC RAI SE2.5.4-1 response provides copies of all correspondence and documentation of personal communications used to support the environmental justice analysis within the ER.

3.5 Aesthetics

This section provides baseline information regarding the aesthetics of the area surrounding the Fermi site and the associated aquatic ecosystems.

3.5.1 General Aesthetics of the Project Area

Refer to ER Subsection 2.2.1.2.4, Viewshed, for a description of the viewshed and visually sensitive areas surrounding the Fermi site.

3.5.2 Aesthetics Associated with the Aquatic Ecosystem

The aesthetics of the aquatic ecosystem at the Fermi site are influenced by two primary factors: wetlands and water quality. These are addressed in the following subsections.

3.5.2.1 Wetland Aesthetics

Refer to ER Subsection 2.4.1.2.3, Habitats, for information regarding the assessment of onsite wetlands and their visual quality/aesthetics. The Fermi site wetlands assessment determined that the wetlands system was not well suited in regard to visual quality/aesthetics, primarily due to the public's general inability to access the Fermi site and observe the wetlands' visual qualities or aesthetics. Refer to the NRC RAI TE2.4.1-6 response for information on reviewing the "DTE Fermi II Site; Monroe County Wetland Investigation Report." Refer to Section 3.6 of the USACE Report for additional information regarding wetlands on and around the Fermi site.

3.5.2.2 Water Quality

Refer to ER Subsection 2.3.3.1, Surface-Water Quality, for descriptions of the surface-water quality of water bodies within the vicinity of the Fermi site and their water quality impairments. As stated in ER Subsection 2.3.3.1, and summarized in ER Table 2.3-67, Summary of Water Quality Impairments in the Vicinity of the Fermi Site, one of the water quality impairments associated with Lake Erie, River Raisin, and the River Rouge watershed is the degradation of aesthetics. Also refer to the NRC RAI

AE2.4.2-4 response for the Fermi 3 Water Quality Survey, which provides additional information regarding the onsite water quality.

3.6 Wetlands

3.6.1 Great Lakes Coastal Wetlands

The MDEQ has identified Great Lakes coastal wetlands as a significant natural feature. The climate along the Western Basin of Lake Erie is more moderate than that of other Great Lakes areas. The protected location and moderate climate of the Lake Erie coastal wetlands result in vegetation communities with a distinct flora because of the habitat diversity, which, in turn, supports a diversity of wildlife. As a group, coastal wetlands contain the largest diversity of plant and wildlife species in the Great Lakes (Reference 3.6.1-1). According to the MDEQ, there is a higher proportion of disturbance-tolerant species within the Great Lakes coastal wetlands than observed in some inland locations, in part because of the development in coastal areas. Approximately 97 percent of Great Lakes coastal wetlands have been lost along the Western Basin of Lake Erie, primarily to agricultural and urban development (according to the Environmental Protection Agency (EPA), Reference 3.6.1-2). The remaining wetlands along the Western Basin of Lake Erie generally reflect high levels of agricultural disturbance such as increased sediment loads, turbidity, and high nutrient and toxicant levels, as well as changes in hydrology patterns and isolation from the lake as the result of manipulation of the shoreline through sheet piling, concrete breakwalls and fill material (Reference 3.6.1-2). Fragmentation of remaining coastal wetlands has resulted in habitat loss and the introduction and spread of invasive species. Refer to the NRC RAI TE4.3.1-6 response for additional data supplied by the MDEQ regarding the overall acreage of existing coastal wetlands and permitting data for Monroe County.

Typical of most remaining Great Lakes coastal wetlands found on the shoreline of the Western Basin of Lake Erie, the Fermi wetland complex formed in a protected estuary and lagoon system. A June 2008 wetlands investigation included a qualitative functions and values assessment. This assessment indicated that the wetlands at the Fermi site, while less floristically diverse than some Lake Erie wetlands, represent a significant feature for the region because other local coastal wetlands have been lost or impaired by past development. It was identified that, similar to other wetlands along the Western Basin of Lake Erie, the wetlands complex at the Fermi site reflects high levels of agricultural disturbance and fragmentation.

3.6.1.1 References

- 3.6.1-1 Albert, D. A., "Between Land and Lake: Michigan's Great Lakes Coastal Wetlands," Michigan Natural Features Inventory, Michigan State University Extension, East Lansing, Michigan, Extension Bulletin E-2902, 2003.
- 3.6.1-2 Environmental Protection Agency (EPA), Detroit River-Western Lake Erie Basin Indicator Project, http://www.epa.gov/med/grosseile_site/indicators/wetlands.html, accessed September 2009.

3.6.2 Project Area

In June 2008, 505 ac. of wetlands and 48 ac. of open water, not including open water areas in Lake Erie, were delineated on the Fermi site. Areas within the delineation boundary did not include open water areas in Lake Erie or the offsite transmission corridors. The primary wetland type on the Fermi site is PEM, comprising 322 ac., followed by PFO (167 ac.) and PSS (16 ac.). Wetlands onsite that may be affected during the construction or operation of Fermi 3 include PEM, PFO, PSS, and open water. A complete description of these wetlands and a functions and values assessment using the Wetland Functions and Values: A Descriptive Approach (The New England Method)

(Reference 3.6.2-1) are provided in the "DTE Fermi II Site, Monroe County Wetland Investigation Report" developed by Ducks Unlimited for Detroit Edison, summarized in ER Subsection 2.4.1.2.3, Habitats, and included within the NRC RAI TE2.4.1-6 response. A summary of the baseline conditions from which the construction and operational impact analysis can be completed is presented here. Refer to ER Subsections 2.4.2.9.1, Aquatic Communities and Principal Aquatic Species and 4.3.1.5.4, Important Habitats, for information regarding wetlands in the transmission corridors.

Refer to the NRC RAI TE2.4.1-11 response for copies of the November 7, 2008, Wetland Assessment letter from the MDEQ.

Palustrine Forested Wetland (PFO)

Typical vegetation in the PFO wetlands on the Fermi site includes silver maple (*Acer saccharinum*), shellbark hickory (*Carya laciniosa*), swamp white oak (*Quercus bicolor*), American elm (*Ulmus americana*), and eastern cottonwood (*Populus deltoides*). The shrub layer in PFO wetlands is dominated by American elm saplings, silky dogwood (*Cornus amomum*), and green ash (*Fraxinus pennsylvanica*) saplings. Common herbaceous species include black raspberry (*Rubus* spp.), mayapple (*Podophyllum peltatum*), reed canary grass (*Phalaris arundinacea*), poison ivy (*Toxicodendron radicans*), and Virginia creeper (*Parthenocissus quinquefolia*). As is typical with many PFO wetland systems, the area has saturated conditions and standing water during the early growing season and after significant precipitation events. There is no standing water throughout much of the rest of the year. Because of the intermittent hydrology of these PFO wetlands, a significant proportion of herbaceous vegetation comprises plant species that favor uplands. Soils within the PFO area are classified as hydric because they are saturated within the upper 12 inches for sufficient durations to create anoxic conditions during the growing season.

Palustrine Scrub-Shrub Wetland (PSS)

Common shrub species in PSS wetlands include silky dogwood, green ash, and hawthorn (*Crataegus* sp.). The PSS wetlands onsite are largely early successional woody communities located on the fringes of PFO and PEM wetland habitats.

Palustrine Emergent Wetland (PEM)

PEM wetlands are dominated by reed canary grass, common reed (*Phragmites australis*), sedge species (*Carex* spp.), and narrow-leaf cattail (*Typha angustifolia*). Vegetative diversity is relatively low in the PEM wetlands located on the Fermi site because of well-developed stands of invasive plants, including common reed and reed canary grass.

Functions and Values Summary

With the exception of a few wetlands isolated by berms or roads, the majority of wetland communities on the site are hydrologically connected. For the purposes of the functions and values assessment, these areas were considered one wetland complex. Refer to the response to NRC RAI HY4.2.1-2 for additional information regarding the hydraulic connections among the bedrock aquifer under the Fermi site, the surface waters (including wetlands, lagoons, canals, ponds, and Lake Erie) in the vicinity of the site, and the existing and proposed gravel fills at the Fermi site.

The qualitative assessment determined that the principal functions provided by the wetland complex include flood flow alteration, sediment/toxicant retention, nutrient removal, and fish and wildlife habitat.

Flood flow alteration, sediment/toxicant retention, and nutrient removal: The Fermi site's wetland complex is large relative to its immediate watershed, approximately two percent, based on

National Wetlands Inventory (NWI) data. The size of this wetland complex can be attributed to a variety of factors, including the site's relatively level topography. If a large storm results in runoff from the watershed, the wetland system slows and detains floodwaters, gradually releasing the stored water and reducing the downstream flood peak. However, the value from flood flow alteration is less significant because there are currently no human interests at risk downstream of the wetland that could be adversely affected by floods. The Fermi 2 unit at the Detroit Edison Fermi site and the proposed Fermi 3, including the cooling towers and the power block, are located downstream of the wetland complex and are within the Lake Erie floodplain. However, the existing and proposed structures associated with the Fermi site are maintained at elevations exceeding the 100-year high water potential. Refer to ER Subsection 3.1.1, Existing Fermi Site Description, for the Fermi site grade and the grade of the power block area. The wetland system provides a sediment trapping function, which also increases the retention of toxicants and pathogens, as well as providing nutrient retention. Potential sources of excess sediment, toxins, and nutrients upstream exist in the agriculturally dominated watershed. Sediment trapping and nutrient uptake is provided best in diffuse, slow-moving areas of the site's wetlands that are bordered or interspersed with dense herbaceous and woody vegetation.

Fish and wildlife habitat: The deepwater and open water habitats found on the Fermi site are suitable to support fish habitat. There is an abundance of cover objects, and the wetland complex is large and part of a larger, persistent, contiguous watercourse with slow velocity. The wetlands have sufficient size and depth to retain open water areas during average winters. Fish species were observed in the wetlands and open water during the wetland delineation. The wetland communities present across the wetland complex provide habitat for a significant number of wildlife species. Although there has been notable direct and indirect disturbance in all wetlands observed, sufficient abundance and diversity in habitat cover remain to support wildlife. With the exception of the buildings and roadways associated with the nuclear plant, the landscape is largely undeveloped with large parcels of vegetated wetlands and uplands. The majority of the wetlands evaluated are connected hydrologically despite fragmentation by multiple roadways. The wetland complex provides an interspersed of open water areas with dense emergent vegetation grading into shrub-scrub and tree-dominated plant communities. The PFO wetlands on the site, which comprise 167 ac. overall, have a high degree of vegetation and species diversity (refer to ER Subsection 2.4.1.1.1, Vegetation on Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10 and Figure 2.4-19, Fermi Site Wetlands Delineation). The federally protected bald eagle (*Haliaeetus leucocephalus*) and state threatened American lotus (*Nelumbo lutea*) and eastern fox snake (*Pantherophis gloydi*) are known to occur onsite.

Additional functions and values that this wetland complex may provide include production export, sediment/shoreline stabilization, science/education, and uniqueness/heritage. The wetland complex was not considered well suited for groundwater recharge/discharge since it is a system driven by surface water. There is no public access to the wetlands and, therefore, the area is not well suited for recreation and visual quality/aesthetics.

3.6.2.1 References

- 3.6.2-1 U.S. Army Corps of Engineers, "The Highway Methodology Workbook Supplement: Wetland Functions and Values: A Descriptive Approach," 1999.

3.7 Fish and Wildlife

This section provides baseline information regarding fish and wildlife and the associated habitats on the Fermi site and in its vicinity. The majority of the baseline information discussed within this section is found in ER Subsections 2.4.1, Terrestrial Ecology, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10 and 2.4.2, Aquatic Ecology, as revised by NRC RAI AE2.4.2-2 and NRC RAI AE2.4.2-3 and their associated tables and figures. The information contained within

these ER subsections provides a baseline from which the impact on fish and wildlife from Fermi 3 construction and operational activities can be determined.

3.7.1 Aquatic Ecosystems

The following subsections provide baseline information concerning aquatic ecosystems, including special aquatic sites, aquatic organisms on or in the vicinity of the Fermi site, the associated aquatic habitats, and recreational or commercial fisheries.

3.7.1.1 Aquatic Habitats on or in the Vicinity of the Fermi Site

Aquatic habitats on the Fermi site are described in ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats. The onsite habitats discussed within ER Subsection 2.4.2.2.1, include the following:

- Circulating water reservoir (heat dissipation system).
- Overflow and discharge canals.
- Drainage ditches.
- The Quarry Lakes.
- Waters within the DRIWR.

Aquatic habitats in the vicinity of the Fermi site are described in ER Subsection 2.4.2.2.2, Principal Aquatic Habitats in the Vicinity of the Fermi Site. The aquatic habitats discussed within ER Subsection 2.4.2.2.2 include Lake Erie, Swan Creek, and Stony Creek, which are not characterized as important aquatic habitats using the NUREG-1555 criteria. The only important aquatic habitat, as defined by NUREG-1555, identified on site is the DRIWR. NUREG-1555 defines important aquatic habitats as follows:

- Wildlife sanctuaries, refuges, or preserves, if they may be adversely affected by plant or transmission line construction or operation.
- Habitats identified by state or federal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by plant or transmission line operation and maintenance.
- Wetlands, floodplains, or other resources specifically protected by federal regulations or executive orders, or by state regulations.
- Land area identified as "critical habitat" for species listed as threatened or endangered by the USFWS.

The only important aquatic habitat, as defined by NUREG-1555, identified on site is the DRIWR, as stated in ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats. Furthermore, ER Subsection 2.4.2.2.2, Principal Aquatic Habitats in the Vicinity of the Fermi Site, states that Lake Erie, Swan Creek, and Stony Creek are not characterized as important aquatic habitats using the NUREG-1555 criteria.

Additional information regarding aquatic organisms and habitats reflecting one year of monitoring effort for aquatic ecology is provided in the NRC RAI AE2.4.2-2 response.

3.7.1.2 Special Aquatic Sites

Special aquatic sites, as defined in 40 CFR 230.3(q-1), the EPA regulations providing Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, are "...geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of the region." Subpart E, 40 CFR 230.40 through 40 CFR 230.45, identifies special aquatic sites as the following:

- Sanctuaries and refuges.
- Wetlands.
- Mudflats.
- Vegetated shallows.
- Coral reefs.
- Riffle and pool complexes.

Thus the Fermi site generally contains two types of special aquatic sites: (1) the DRIWR and (2) the wetlands. If the Fermi site contains either mudflats or vegetated shallows, they are co-located within areas otherwise identified as wetlands.

3.7.1.2.1 Sanctuaries and Refuges

In accordance with 40 CFR 230.40, "[s]anctuaries and refuges consist of areas designated under State and Federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources." A portion of the DRIWR is located on the Fermi site as presented in Section 3.3. ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats and ER Subsection 2.4.2.2.1.2, Principal Aquatic Species in Quarry Lakes and Waters of the Lagoon Beach Unit of the DRIWR, provide baseline information regarding waters and associated aquatic organisms within the DRIWR.

As discussed in Section 3.3 of the USACE Report, the cooperative management agreement between Detroit Edison and the USFWS allows the USFWS to protect and manage wildlife and fish populations on portions of the Fermi site. The only aquatic habitat on the site identified as "important aquatic habitat," as defined in NUREG-1555, is the habitat within the DRIWR.

3.7.1.2.2 Wetlands

In accordance with 40 CFR 230.4(a)(1), "[w]etlands consist of areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Refer to Section 3.6 of the USACE Report for information regarding wetlands located on and in the vicinity of the Fermi site.

3.7.1.3 Aquatic Organisms

The following subsections provide information regarding the aquatic organisms associated with the principal aquatic habitats in the vicinity of and on the Fermi site.

3.7.1.3.1 Aquatic Organisms Associated with the Principal Aquatic Habitats in the Vicinity of the Fermi Site

Multiple subsections within the ER provide information regarding aquatic organisms and associated habitats in the vicinity of the Fermi site. The most notable sources of information regarding aquatic organisms and habitat in the ER are as follows:

- Subsection 2.4.2.2.2.1, Principal Aquatic Species in Lake Erie and associated tables and figures – Information regarding the plankton, benthic invertebrates, and fish inhabiting Lake Erie.
- Subsection 2.4.2.2.2.2, Principal Aquatic Species in Swan Creek – Information regarding fish species within Swan Creek.
- Subsection 2.4.2.2.2.3, Principal Aquatic Species in Stony Creek – Information regarding the benthic invertebrates and fish inhabiting Stony Creek.
- Appendix 2A, Life Histories of Aquatic Species – Information concerning critical life-support requirements such as spawning areas, nursery grounds, food habits, feeding areas, wintering areas, and migration routes.
- Appendix 2B, Life Histories of Threatened and Endangered Species – Life history information concerning state and federally listed threatened and endangered aquatic species identified within ER Table 2.4-15, Threatened and Endangered Fish and Mollusk Species Within a 50-Mile Radius of the Fermi Site.

3.7.1.3.2 Aquatic Organisms Associated with Principal Aquatic Habitats Onsite

Information regarding aquatic organisms and associated habitats on the Fermi site is found in the following areas of the ER:

- Subsection 2.4.2.2.1.1, Principal Aquatic Species in Circulating Water Reservoir, Overflow and Discharge Canals, and Drainage Ditches.
- Subsection 2.4.2.2.1.2, Principal Aquatic Species in Quarry Lakes and Waters of the Lagoon Beach Unit of the DRIWR and the associated table.
- Table 2.4-6, Flora and Fauna Noted on the Fermi Site during Wildlife Habitat Council (WHC) Site Visit, July 2000.

Refer to the NRC RAI AE2.4.2-2 response for the aquatic ecology survey report, which provides additional information regarding the onsite aquatic habitat features and organisms. The NRC RAI AE2.4.2-2 response is the result of a 1-year monitoring effort on aquatic ecology.

In summary, as stated in ER Subsection 2.4.2.2.1.2, there are no known important aquatic species, as defined in NUREG-1555, in the onsite Quarry Lakes and waters within the Lagoon Beach unit of the DRIWR.

3.7.1.4 Recreational and Commercial Fisheries

In accordance with 40 CFR 230.51 "[r]ecreational and commercial fisheries consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man." Refer to ER Subsection 2.4.2.3, Commercial and Recreational Fisheries, for information regarding commercial and recreational fisheries within Lake Erie, Swan Creek, Stony Creek, the DRIWR, and other water bodies

located at the Fermi site. As stated in ER Subsection 2.4.2.3, Lake Erie supports one of the largest freshwater commercial fisheries in the world and is one of the warmest and biologically productive of the Great Lakes. Lake Erie produces more fish each year for human consumption than the other four Great Lakes combined. Although Swan Creek does not support any recognized commercial fishery operations, it does support a strong recreational fishery for common game fish. There are no recognized commercial or recreational fisheries within the boundaries of Stony Creek, the DRIWR, or other water bodies located at the Fermi site.

3.7.2 Terrestrial Ecosystems

The following subsections provide baseline information concerning terrestrial ecosystems, including terrestrial vegetation, wildlife, and associated habitats on or in the vicinity of the Fermi site.

3.7.2.1 Terrestrial Organisms

The following subsections provide baseline information regarding terrestrial vegetation and terrestrial wildlife.

3.7.2.1.1 Terrestrial Vegetation

Information regarding floral and faunal components found at the Fermi site is contained within ER Subsection 2.4.1.1.1, Vegetation on Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10 and the associated figures and tables. Specifically, refer to ER Table 2.4-2, Plant Species Listed for the Fermi Site, for a list of plant species observed during site reconnaissance visits or reported as occurring on the Fermi site. Also refer to the NRC RAI TE2.4.1-2 response for the confirmatory terrestrial ecology survey report, which provides additional information regarding terrestrial vegetation at the Fermi site.

For a discussion of terrestrial vegetation in the offsite transmission corridors, refer to ER Subsection 2.4.1.9.1, Vegetation.

3.7.2.1.2 Terrestrial Wildlife

Refer to ER Subsection 2.4.1.1.2, Wildlife on the Site and Vicinity, for information concerning mammals, birds (water dependent birds; birds of prey; upland game birds; and birds of forest, shrub and grassland plant communities), reptiles, and amphibians. Also refer to the NRC RAI TE2.4.1-2 response for the confirmatory terrestrial ecology survey report, which provides additional information regarding terrestrial wildlife at the Fermi site.

Refer to ER Subsection 2.4.1.9.2, Wildlife, for a discussion of terrestrial vegetation in the offsite transmission corridors.

3.7.2.2 Terrestrial Habitat

As stated in ER Subsection 2.4.1.3, Habitat Importance, the Fermi site provides habitat for a variety of wildlife. Although the Fermi site provides habitat for the important species described in ER Subsection 2.4.1.2, Important Terrestrial Species and Habitats, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10 as indicated in ER Subsection 2.4.1.3, the onsite habitats are not unique as compared with the habitats of these species across their entire ranges.

Refer to ER Subsection 2.4.1.2.3, Habitats, for information regarding habitats associated with the terrestrial species discussed within the referenced sections of the ER.

Refer to ER Subsection 2.4.1.9, Transportation Corridors and Offsite Areas, for information regarding habitats associated with the offsite transmission corridors.

3.8 Navigation

This section provides baseline information related to navigation and marine transportation in the Western Basin of Lake Erie and near the Fermi site.

3.8.1 Navigation Characteristics of the Region

Refer to the Final Safety Analysis Report (FSAR), Subsection 2.2.1, Locations and Routes, for a description of waterway shipping facilities in the Western Basin of Lake Erie. Likewise, refer to ER Subsection 2.2.1.2.6, Water, Rail, and Air Transportation, for a discussion of regional navigation transportation. The nearest port facility to the Fermi site is the Port of Monroe, which is located approximately 11.2 km (seven mi.) south of the Fermi site near the mouth of the Raisin River as it flows into Lake Erie. The Port of Monroe is a small facility and Michigan's sole port on Lake Erie. ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius, illustrates the location of the Fermi site and the Port of Monroe.

There are federal navigation channels as well as entrance channels in the Western Basin of Lake Erie that provide access to the ports in the Western Basin. Federal navigation channels are maintained waterways established by the federal government for intrastate and interstate waterborne commerce. Entrance channels are maintained waterways that provide the initial points of entry to ports and harbors. FSAR Subsection 2.2.2.4, Description of Waterways, describes the types of vessels that transport goods to and from ports in the Western Basin of Lake Erie and the relevant measurements of the navigational waterways in the Western Basin.

The West Outer Channel and the East Outer Channel are federal navigation channels that connect in Lake Erie approximately 11.2 km (seven mi.) northeast of the Fermi site. The West Outer Channel provides the closest shipping approach in Lake Erie, at more than eight km (five mi.) away from the Fermi site. FSAR Figure 2.2-201, Industries and Transportation Routes Within 8 Km (5 Mi), illustrates the navigation channels in the Fermi region. The project width of the East Outer Channel is 1,200 feet; the project width of the West Outer Channel is 800 feet (Reference 3.8-1).

Refer to ER Subsection 2.5.2.10.2, Public Transportation, Airports, Ports, and Railways, for a discussion on barge traffic in the Western Basin of Lake Erie. ER Table 2.5-60, Regional Ports, provides data including the number of berths and the depth and length of each berth for the Ports of Monroe, Toledo, and Detroit. The Port of Monroe channel data are presented in Table 3.8-1 of the USACE Report (Reference 3.8-1). Channel data for the Toledo Harbor are presented in Table 3.8-2 of the USACE Report (Reference 3.8-2). Channel data for the Detroit River are presented in Table 3.8-3 of the USACE Report (Reference 3.8-3). It should be noted that, for the channel data presented in the tables of this subsection, project width refers to the federally authorized channel width, and project length and project depth also refer to the federally authorized dimensions.

3.8.2 Navigation Characteristics of the Project Area

The West Outer Channel is the federal navigational channel nearest the Fermi site. It is outside the security zone boundary established for the Fermi site. Refer to FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, for a discussion of the Lake Erie security zone associated with Fermi 2. The same Lake Erie security zone for Fermi 2 would be maintained for Fermi 3.

FSAR Figure 2.2-201, Industries and Transportation Routes Within 8 Km (5 Mi), illustrates the West and East Outer Channel locations in relation to the Fermi site.

ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1 states that there is a former barge slip in the northeast area of the Fermi site. The former barge slip was utilized only for construction of Fermi 2 and has not been used for Fermi 2 operations. The water depth between the West Outer Channel to the Fermi site ranges from approximately 20 feet to 17 feet on approach to the EAB. Inside the EAB, the water depth ranges from 18 feet to 15 feet. Near the shore of the Fermi site, the water level is much shallower, at approximately five feet (Reference 3.8-4). ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, illustrates the existing Fermi 2 and proposed Fermi 3 barge facility locations.

FSAR Subsection 2.2.2.4, Description of Waterways, indicates that the waters and adjacent shoreline of Fermi 2 are designated as a security zone, as set forth in 33 CFR 165.915. Entry into this zone is prohibited unless authorized by the U.S. Coast Guard (USCG). ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius, illustrates the security zone that extends from the Fermi site shoreline and waterward. The Fermi 2 EAB extends a radius of 915 meters from the center line of Fermi 2. The Fermi 3 EAB extends a radius of 2,928 feet from the center line of Fermi 3. The EAB radius extends into Lake Erie. FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, states that the water portion of the EAB for Fermi 2 and Fermi 3 in Lake Erie is controlled through security surveillance, use of the public address system to warn boaters, and placement of buoys that identify the area as restricted. Figure 1.2-2, Exclusion Area Boundary Plan View illustrates the Fermi 2 EAB. Figure 1.2-15, Fermi 3 Temporary Work Area Plan View, illustrates the Fermi site property boundary. Figure 1.2-21, Fermi 3 – Exclusion Area Boundary Plan View, illustrates the Fermi 3 EAB.

3.8.3 Fermi Intake and Outfall Structures and Navigation

Regarding the plant intake structure and navigation, ER Subsection 3.4.2.1, Intake System, states that the intake structure for Fermi 2 is located between two groins that extend 600 feet into Lake Erie. However, the groins and intake structure do not interfere with navigation in the Western Basin of Lake Erie. The proposed Fermi 3 intake structure will also be located between the groins, near the Fermi 2 intake structure.

ER Subsection 2.3.3, Water Quality, as revised by NRC REI AE2.4.2-4 discusses the permitted outfalls associated with Fermi 2 operations. These outfalls are permitted through the National Pollutant Discharge Elimination System (NPDES) under Permit Number MI0037028. Refer to the response to NRC RAI HY2.3.1-14 for a copy of the referenced NPDES permit. In particular, there are two permitted outfalls that discharge directly into Lake Erie: Outfall 001 and Outfall 013. These outfalls do not extend into Lake Erie. These existing outfalls do not interfere with navigation in the Western Basin of Lake Erie.

ER Figure 2.3-47, Permitted Outfalls Located at the Fermi Site, illustrates the location of these outfalls. ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, illustrates the location of the Fermi 2 and proposed Fermi 3 intake and discharge structures.

3.8.4 References

- 3.8-1 Port of Monroe, Shipping Facilities, <http://www.portofmonroe.com/facil.htm>, accessed 14 July 2009.
- 3.8-2 National Oceanic and Atmospheric Administration, National Ocean Service, Office of Coast Survey, "Booklet Chart, West End of Lake Erie (NOAA Chart 14847)."

3.8-3 National Oceanic and Atmospheric Administration, National Ocean Service, Office of Coast Survey, "Booklet Chart, Detroit River (NOAA Chart 14848)."

3.8-4 National Oceanic and Atmospheric Administration, National Ocean Service, Office of Coast Survey, "Booklet Chart, West End of Lake Erie (NOAA Chart 14830)."

3.9 Recreation

This section provides baseline information regarding recreational resources on the Fermi site and the surrounding region.

Refer to the NRC RAI SE4.4.2-4 response for copies of all correspondence and documentation of personal communication used to support the analysis of tourism and recreation within the ER.

3.9.1 Regional Overview

Refer to ER Subsection 2.2.3.4, Regional Natural and Recreational Areas, for information concerning certain major recreational areas within the 50-mi. region surrounding the Fermi site. The table and figure referenced in ER Subsection 2.2.3.4 (and listed below) provide additional information regarding natural and recreational areas within the region surrounding the Fermi site:

- Table 2.2-9, Recreation Areas in the Fermi Region.
- Figure 2.2-7, Natural, Public, and Recreation Areas within the 50-Mile Region.

Refer to the response to NRC RAI SE4.4.2-4 for correspondence and documentation of personal communications used to support the analysis in the ER sections on tourism and recreation.

3.9.2 General Recreational Resources on the Fermi Site and within Its Vicinity

The following subsections provide baseline information concerning general recreational resources and activities available to the public on and around the Fermi site.

3.9.2.1 General Recreational Resources on the Fermi Site

As stated in ER Section 2.1, Station Location, there are no recreational facilities on the Fermi site. Detroit Edison does not allow access to Fermi site for recreational purposes (refer to ER Subsection 2.2.1.1, The Site), as revised by NRC RAI GE3.1-1.

3.9.2.2 General Recreational Resources within the Vicinity of the Fermi Site

As stated in ER Subsection 2.2.1.2.5, Natural and Recreational Areas, several recreational facilities are within the vicinity of the Fermi site. They include wildlife conservation areas that provide hiking, fishing, and other recreational opportunities. Major recreation areas in the vicinity of the Fermi site are described in ER Table 2.2-4, Recreation Areas in the Fermi Vicinity. Refer to ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius, for an illustration of the Fermi site and its associated security zone in relation to the location of state parks or forests, and local parks or recreational areas within its vicinity. Refer to ER Subsection 2.2.1.2.5, for additional information regarding the public's utilization of recreational opportunities within the vicinity of the Fermi site.

Information specific to recreational facilities and programs offered in Monroe County, Michigan, is contained in ER Subsection 2.5.2.7, Public and Private Recreational Facilities. Additional information concerning general recreational resources within the vicinity of the Fermi site is included in the following ER tables and figures:

- Table 2.5-48, Monroe County Recreational Facilities.
- Table 2.5-49, List of Recreation and Lodging Facilities within a 10-mi Radius.

Information regarding the Fermi site's current impact on areas that have a high degree of visitor use or recreational areas is provided in ER Subsection 3.1.2, New Facility Arrangement, as revised by NRC RAI GE3.1-1. ER Subsection 3.1.2 indicates that visual impacts on surrounding areas caused by existing structures on the Fermi site are limited to the immediate adjacent residents and traffic on Dixie Highway and the nearby smaller arterial roads.

3.9.3 Water-Related Recreational Resources on and within the Vicinity of the Fermi Site

The following subsections provide baseline information concerning water-related recreational resources and activities available to the public on and around the Fermi site. "Water-related recreation" encompasses activities undertaken for amusement and relaxation. Activities encompass two broad categories of use: consumptive, e.g., harvesting resources by hunting and fishing; and non-consumptive, e.g., canoeing and sight-seeing" (Reference 3.9-1).

3.9.3.1 Water-Related Recreational Resources on the Fermi Site

Water-related recreational activities are not allowed on the Fermi site. As described in FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, the portion of the Fermi 2 and Fermi 3 EAB within Lake Erie is controlled through security surveillance and demarcated by buoys. The security zone designation of all waters and shorelines adjacent to the Fermi site, as set forth in 33 CFR 165.915, provides additional protection to the site (Reference 3.9-2). Entry into the security zone is prohibited unless authorized by the USCG. Refer to ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius, for an illustration of the Fermi site and its associated security zone.

In FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, additional explanatory information is provided as to why the Fermi site is not suitable for recreational activities. As stated in FSAR Subsection 2.1.2.3, the Fermi site's shoreline is not appropriate for beach activities, the shoreline is inaccessible to the public from land, and the site is posted as private property.

3.9.3.2 Water-Related Recreational Resources within the Vicinity of the Fermi Site

Information regarding water-related recreational resources within the vicinity of the Fermi site is provided in various places within ER Chapter 2, Environmental Description. Refer to the following ER subsections for information about various aspects of water-related recreation within the vicinity of the Fermi site:

- Subsection 2.3.2.1.3, Non-Consumptive Surface-Water Use, which provides information about the principal communities with recreational water use facilities within a six-mi. radius of the Fermi site.
- Subsection 2.3.3.1, Surface-Water Quality, which provides information about the beneficial use impairments to surface water bodies within the vicinity of the Fermi site, including recreational water quality impairments.

- Subsection 2.4.2.2.2, Principal Aquatic Habitats in the Vicinity of the Fermi Site, which provides information about water bodies within the vicinity of the Fermi site, including Swan Creek's use for recreational purposes.
- Subsection 2.4.2.3, Commercial and Recreational Fisheries, which provides information specific to commercial and recreational fishing within Lake Erie, Swan Creek, and other waters, including those on the Fermi site.

Additional information concerning water-related recreation within the project's vicinity is provided in the following ER tables:

- Table 2.3-28, The Nine Sectors of Water Consumption in the Great Lakes Basin.
- Table 2.3-67, Summary of Water Quality Impairments in the Vicinity of the Fermi Site.
- Table 2.4-14, Commercial and Recreational Fish Species in the Vicinity of the Fermi Site.

3.9.4 References

- 3.9-1 U.S. Environmental Protection Agency, EPA Section 404(B)(1), "Guidelines for Specification or Disposal Sites for Dredged or Fill Material," 40 C.F.R. § 230.52, http://edocket.access.gpo.gov/cfr_2009/julqtr/pdf/40cfr230.52.pdf, accessed 5 November 2009.
- 3.9-2 Coast Guard, Department of Homeland Security, "Regulated Navigation Areas and Limited Access Areas," 33 C.F.R. § 165.915, http://edocket.access.gpo.gov/cfr_2009/julqtr/pdf/33cfr165.915.pdf, accessed 5 November 2009.

3.10 Safety

This section provides baseline information regarding public safety as it relates to existing onsite impoundments, and public safety and general plant design and operations. This section also provides baseline information regarding social services, public facilities, and transportation in the Fermi 3 area.

3.10.1 Onsite Impoundments

The existing onsite impoundments at the Fermi site discussed below are all man-made and used to collect and confine water, wastewater, and dredged material. The onsite impoundments include the following:

- Circulating Water System (CWS) Reservoir.
- Dredged Material Disposal Basin.
- Quarry Lakes.

3.10.1.1 Circulating Water System Reservoir

ER Subsection 2.3.1, Hydrology, states that the site contains a man-made water basin that specifically supports the function of the Fermi 2 CWS. This man-made basin is the CWS reservoir. The reservoir has a surface area of approximately 5.5 ac., with a capacity of 27.5 million gallons of water at normal level. As a result of evaporative losses, the dissolved solids concentration in the reservoir increases, requiring blowdown from the CWS reservoir to Lake Erie in order to maintain the concentration of dissolved solids in the reservoir at an acceptable level (Reference 3.10-1). The source water for the CWS reservoir is the Fermi 2 intake on Lake Erie. Figure 3.10-1 illustrates the location of the CWS. This figure is from the Fermi 2 UFSAR Revision 10, dated November 2000 (Reference 3.10-2). Figure 3.10-2 is an aerial photograph illustrating the construction of the CWS.

The CWS reservoir is sufficient in size and cooling water reserve to continue plant operations for a limited period of time (hours) if the Fermi 2 intake is affected to the extent that there is an interruption to the cooling water supply for an extended period of time. If the intake were to become inoperable for an extended period of time, reduction in load and shutdown would be performed (Reference 3.10-3). The CWS reservoir performs no safety-related functions and is not required for safe shutdown of the unit. As a normal operating procedure, there is a continuous release of water from the reservoir through a permitted outfall and the water level is maintained at a constant level. Thus, it is unlikely that an uncontrolled release of water from the CWS reservoir onto the Fermi site would occur (Reference 3.10-4). Therefore, there is no risk to public safety from the CWS reservoir structure or its operations.

3.10.1.2 Dredged Material Disposal Basin

The dredged material disposal basin supports Fermi 2 operations. The Fermi plant was issued USACE Permit Number 88-001-040-8 on May 26, 2004. The permit authorizes hydraulic dredging of up to 25,000 cubic yards (cu yd.) annually from the Fermi 2 intake area. In addition, the permit authorizes the disposal of dredged material into the onsite dredged spoils disposal basin (Reference 3.10-5). Similar to the USACE permit, the MDEQ issued Permit Number 04-58-0009-P to the Fermi site, which is a permit for hydraulically dredging the Fermi 2 intake area, considered part of Great Lakes submerged lands (Reference 3.10-6). ER Figure 2.1-4, Fermi 3 Site Plan, as revised by NRC RAI GE3.1-1 illustrates the location of the dredged spoils disposal basin. ER Subsection 2.3.1.1.3.3, Plant Intake/Discharge Interface with Lake Erie, contains a discussion of the dredging activities associated with Fermi 2 operations.

Materials removed during maintenance dredging operations, in accordance with the USACE and MDEQ permits, are disposed of in the onsite dredged spoils disposal basin via an eight-inch diameter slurry pipeline. The dredged spoils basin has an area of approximately 11 ac. and is supported by embankments that are used to retain the dredged spoils and prevent them from returning to the Western Basin of Lake Erie. Figure 1.2-5, Dredge Disposal Storage Basin Plan View, illustrates the dredged material disposal basin. Figure 1.2-7, Dredge Disposal Storage Basin Cross Sections, provides cross-sectional views of the dredged material storage basin. The dredged spoils disposal basin has a weir that allows water to return to Lake Erie while retaining the sediment (Reference 3.10-5). Figure 1.2-6, Dredge Disposal Storage Basin Discharge Weir Cross Section, provides cross-section and detail views of the weir structure. The dredged spoils disposal basin discharges through Outfall 013, as authorized under the Fermi 2 NPDES permit (Reference 3.10-7). Additional information regarding dredged material sampling and analysis, and turbidity associated with dredging operations is available within the response to NRC RAI HY4.2.1-8.

If the dredged spoils disposal basin embankment were to fail, it is anticipated that the impact would be limited to the south lagoon and a localized portion of Lake Erie. The dredged spoils disposal basin is located within the property boundary for Fermi 2 where public access is prohibited. ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, illustrates the location of the dredged spoils disposal basin within the property boundary.

3.10.1.3 Quarry Lakes

Quarrying at the Fermi site began in 1958 to support Fermi 1 construction and continued periodically until August 1970. ER Subsection 3.1.1, Existing Fermi Site Description, states that the Quarry Lakes served as the rock quarry for the construction activities for Fermi 2. In November 1970, quarrying operations resumed in the area immediately south of the original excavation. As the excavation progressed, two dikes were built to divide the quarry into one operating and one recharge sector, respectively. These dikes were constructed so that quarrying operations did not significantly affect water levels in the regional aquifer. In 1971, the isolated sections of the quarry were allowed to fill with groundwater (Reference 3.10-8). These flooded isolated sections of the quarry are now known as the Quarry Lakes. ER Subsection 2.4.2.2.1, Onsite Principal Aquatic Habitats, states that the two lakes are approximately 50 feet deep and cover an area of approximately 100 ac. Refer to ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, for the location of these two Quarry Lakes.

The Quarry Lakes do not pose a public safety risk that would be associated with a structural failure because these lakes developed as the result of groundwater infiltration in a belowground excavation. The water level in the Quarry Lakes is directly related to local groundwater levels (Reference 3.10-9). Although it is highly unlikely that the dikes would fail, if this occurred, the dikes would fail into the quarry itself and the water in the Quarry Lakes would not flow out. Instead, the water currently separated by the presence of the dikes would be allowed to flow from one area to the other to create equilibrium. Further, there is insufficient hydraulic head to elevate the water level in the Quarry Lakes above ground surface (Reference 3.10-9). There are no Fermi 2 operations or recreational activities associated with these lakes, and these lakes are located within the property boundary of the Fermi site. ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, illustrates the location of the Quarry Lakes within the site.

3.10.2 Fermi 2 Plant Operations and Public Safety

The Fermi 2 plant is designed, fabricated, and operated to generate electricity in a safe and reliable manner. The plant design conforms to applicable codes and regulations and complies with applicable regulatory guides (Reference 3.10-10).

Additionally, the plant is designed, fabricated, erected, and operated in such a manner that the release of radioactive materials to the environment is within the limits given in 10 CFR 20 and 10 CFR 50, pertaining to the release of radioactive materials during normal operation and abnormal events (Reference 3.10-10).

Careful consideration has been given to all known environmental conditions associated with maintenance, testing, and postulated accidents that could result in unplanned releases of radioactive material from the plant. Pollution control equipment and specific design provisions are incorporated in the plant for the specific purpose of protecting public health and safety from the release of radioactive material under both normal and abnormal conditions (Reference 3.10-10).

3.10.3 Fermi 3 Baseline Conditions - Social Services, Public Facilities, and Transportation

Refer to ER Subsection 2.5.2.9, Social Services and Public Facilities and the associated tables and figures, for a description of the water and sewer services, police service, fire protection service,

community emergency planning, and hospital and ambulance services. The NRC RAI SE4.4.2-2 response provides copies of all correspondence and documentation of personal communications used to support the analysis of public safety and social services within the ER.

Refer to ER Subsection 2.5.2.10, Transportation System, for a description of the transportation network in the 50-mi. Fermi region.

3.10.4 References

- 3.10-1 DTE Energy, "Fermi 2 Combined Operating License Application," Subsection 3.4.1.1, Supplement 4, February 1978.
- 3.10-2 DTE Energy, "Fermi 2 Updated Final Safety Analysis Report," Subsection 1.2.2.1, Revision 10, November 2000.
- 3.10-3 DTE Energy, "Fermi 2 Updated Final Safety Analysis Report," Subsection 2.2.3.1, Revision 9, April 1999.
- 3.10-4 DTE Energy, "Fermi 2 Combined Operating License Application," Subsection 5.1.2, Supplement 1, June 1975.
- 3.10-5 Department of the Army, Detroit District Corps of Engineers, Engineering and Technical Services, Regulatory Office, Permit Number 88-001-040-8 issued to Detroit Edison.
- 3.10-6 Michigan Department of Environmental Quality, Permit Number 04-58-0009-P, Part 325 Great Lakes Submerged Lands, issued to Detroit Edison on July 21, 2004.
- 3.10-7 Michigan Department of Environmental Quality, "National Pollutant Discharge Elimination System (NPDES) Permit – Detroit Edison Company Fermi 2 Power Plant, Permit No. MI0037028," 2005, <http://www.epa.gov/npdescan/MI0037028FS.pdf>, accessed 26 July 2008.
- 3.10-8 DTE Energy, "Fermi 2 Combined Operating License Application," Subsection 2.5.3.5.2, Supplement 3, August 1977.
- 3.10-9 DTE Energy, "Fermi 3 Combined License Application, Part 2: Final Safety Analysis Report," Revision 1, March 2009.
- 3.10-10 DTE Energy, "Fermi 2 Updated Final Safety Analysis Report," Subsection 1.2.1.1.1 Plant Criteria.

3.11 Historic Properties and Archaeological Resources

The following subsections provide baseline information regarding the historic properties in the area surrounding and on the Fermi site. As indicated in ER Subsection 2.5.3, Historic Properties, as revised by NRC RAI GE3.1-1, the cultural resources investigations for the Fermi 3 project were completed pursuant to Section 106 of the National Historic Preservation Act (NHPA). Furthermore, the work reported within the ER conforms to the requirements of the NHPA, guidance contained within NUREG-1555, and the requirements of the Michigan State Historic Preservation Office (SHPO).

Refer to ER Subsection 2.5.3.1, Prior Cultural Resources Surveys, as revised by NRC RAI GE3.1-1, for a description of the record searches at the Office of the State Archaeologist (OSA), the State of Michigan Archives, the Monroe County Museum, and the Michigan SHPO.

Refer to ER Subsection 2.5.3.2, Current Cultural Resources Survey, as revised by NRC RAI GE3.1-1, for a description of the cultural resources survey undertaken during 2007, 2008, and 2009, the determination of the Area of Potential Effect (APE), and the survey results.

Refer to the NRC RAI CR4.1.3-6 response for the Phase I cultural resources report prepared for the Fermi 3 project.

The following NRC RAI responses provide additional general baseline information regarding historic properties and archaeological resources:

- NRC RAI CR2.5.3-1 provides copies of Native American consultations.
- NRC RAI CR4.1.3-1 provides copies of all past, present, and future correspondence and documentation of discussions between Detroit Edison and the SHPO regarding cultural resources and/or historic properties in the direct and/or indirect areas of the APE for Fermi 3, and Fermi 1 and Fermi 2 as they relate to Fermi 3.

3.11.1 Historic Properties within the Project Area

Refer to ER Subsection 2.5.3.5, Above-ground Resources Results, for a description of the historic properties (aboveground resources) within the Fermi 3 project aboveground APE. The only structure on the Fermi site of possible note is the Enrico Fermi Atomic Power Plant, Unit 1 (Fermi 1). Fermi 1 was evaluated as part of a separate cultural resources survey to assess its National Register of Historic Places (NRHP) eligibility. The Fermi 1 survey was documented in the March 2009 report titled "Preliminary National Register of Historic Places Evaluation for the Enrico Fermi Atomic Power Plant Monroe County, Lagoona Beach, Michigan." Refer to the NRC RAI CR4.1.3-7 response to obtain the Fermi 1 survey. The Fermi 1 survey, as documented within the report, resulted in the preliminary conclusion that Fermi 1 retains the characteristics of significance and integrity necessary for NRHP consideration.

3.11.2 Archaeological Resources within the Project Area

Refer to ER Subsection 2.5.3.4, Archaeological Site Results, as revised by NRC RAI GE3.1-1, for a description of the archaeological resources within the Fermi site and vicinity. None of the identified sites are recommended as eligible for listing in the NRHP.

3.11.3 Maritime Resources within the Project Area

Submerged Site Sensitivity Study (Study), provided in the response to NRC RAI CR4.1.3-8, documents the review of the proposed near-shore dredging/outfall activity area associated with the Fermi 3 project. Study activities were conducted in 2009 to assess the proposed project's potential to impact underwater resources within the APE. The Study consisted of identifying previously reported submerged sites and maritime-related resources within the vicinity of the APE of the dredging/outfall activity area and developing a predictive model to determine the likelihood of the APE to contain cultural resources. The Study did not involve conducting a survey for underwater resources.

3.11.3.1 Maritime Historic Resources

The Study included a review of all recorded resources within three mi. of the Fermi 3 project because of the dynamic nature of the submerged sites and the absence of precise location information for submerged sites. Refer to Figure 1 of the Study for the locations of the four previously identified shipwrecks located within this three-mi. area. The Study further recommended that the entire APE be considered as having a moderate to high sensitivity for containing previously unidentified maritime

resources, based on the proximity of known submerged resources in the vicinity of the project area, the lack of research on submerged sites within the area, and the shallow-water environment of the project area.

3.11.3.2 Maritime Archaeological Resources

The Study included a search of the files maintained by the Michigan Office of the State Archaeologist (OSA). A review of the Michigan OSA files indicated one previously recorded archaeological site (20MR702) on the Lake Erie shoreline of the existing Fermi site (Figure 5 of the Study). This site is listed as a prehistoric site of unknown cultural period, and it has not been evaluated for possible listing in the NRHP. No evidence of this site was found during the Fermi 3 archaeological survey conducted in 2008.

3.12 Flood Hazards and Floodplain Values

This section provides baseline information regarding impacts on flood hazards and significant natural and beneficial floodplain values associated with floodplains on and in the vicinity of the Fermi site.

Floodplains possess natural values and perform functions important to the public interest, including moderating floods; maintaining water quality; recharging groundwater; supporting fish, wildlife, and plant resources; providing cultural resources such as open space and recreation; and providing cultivated resources for agriculture.

3.12.1 General Flood Hazards and Floodplain Value Status and Issues

The ER and FSAR provide information on historic flood records, floodplain maps, and lake effects affecting flooding as related to Lake Erie, the Fermi site, and the streams and rivers in the Fermi site area. This information establishes a baseline from which to judge the impact of Fermi 3 construction and operational impacts regarding flood hazards and floodplain values.

Refer to ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, for general information about flooding at the Fermi site and the raised elevation of the Fermi site. Also refer to the following:

- ER Subsection 2.3.1.1.2, Lake Erie Characteristics, which contains general information about Lake Erie water levels and links to historic water level data in the following:
 - Table 2.3-6, Great Lakes Water Level Table for Lake Erie.
 - Table 2.3-7, Great Lakes Water Levels.
 - Table 2.3-8, Lake Erie Mean Lake Levels.
- ER Subsection 2.3.1.1.3, Lake Erie Western Basin, which includes general information about Lake Erie Western Basin water levels and historic water level data in the following:
 - Table 2.3-9, Historic Max and Min Water Levels for Fermi 3.
 - Table 2.3-11, Extreme Recorded Lake Erie Water Levels.
 - Table 2.3-12, Possible Storm Induced Lake Level Increases (feet), which presents USACE estimates of storm-induced increases of the water level.

- The RAI response to NRC RAI HY2.3.1-10, which presents maps of the full extent of the 100 year floodplains of Swan Creek and Lake Erie in the vicinity of the Fermi site.
- ER Figure 2.3-15, FEMA Flood Insurance Rate Map, which presents Lake Erie open coast flood levels.
- ER Figure 2.3-16, FEMA Flood Insurance Rate Map, which contains Monroe County, Michigan flood risk zone mapping.
- FSAR Subsection 2.4.2, Floods, and the figures referenced therein, which includes a discussion of the flood history of the Fermi 3 site, flood design considerations, effects of local intense precipitation, probable maximum floods, and probable maximum surge and seiche flooding.

The subsections referenced above describe the lack of direct, secondary, or cumulative impacts of the existing Fermi site and past Fermi operations on storms, lake effects, flood hazards, and floodplain values in the Fermi site general vicinity.

3.13 Shore Erosion and Accretion

This section provides baseline information regarding erosion and accretion on the Lake Erie shore along and in the vicinity of the Fermi site or associated with the Fermi facilities.

3.13.1 General Erosion and Accretion Status and Issues

The ER and FSAR provide information on historic erosion, sediment transport, and related effects concerning Lake Erie, the Fermi site, and the streams and rivers in the Fermi site area. This information establishes a baseline from which to assess the impact of Fermi 3 construction and operation regarding shore erosion and accretion.

As indicated in the ER subsections and other documents identified and summarized below, there is no evidence of erosion problems at the site:

- ER Section 2.1, Station Location and Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, which include a general statement about the lack of erosion issues on Lake Erie near the Fermi site.
- ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, which provides background information on Coastal Zone Management Act (CZMA) applicability.
- ER Subsection 2.3.1.1.3.2, Lake Erie Western Basin Erosion Characteristics and Sediment Transport, which describes erosion and sediment transport in the area.
- ER Subsection 2.3.3.1, Surface-Water Quality (Lake Erie), which presents information on sediment sources to Lake Erie.
- The NRC RAI HY2.3.1-11 response, which provides photos of the Lake Erie shoreline from 1981, 1992, 1998, 2005, and 2008.
- FSAR Subsection 2.4.1.2.2, Lake Erie, which presents background information on Lake Erie and the protective shoreline barrier at the Fermi site.

- FSAR Subsection 2.4.2.3, Effects of Local Intense Precipitation, which compares plant grade to extreme rainfall and runoff calculations.
- FSAR Subsection 2.4.5.5, Sedimentation and Erosion, and Subsection 2.4.5.6, Protective Structures, which address plant scope and storm surges.

The subsections referenced above describe the lack of direct, secondary, or cumulative impacts of storms, lake effects, and existing Fermi site operations on shore erosion and accretion at the Fermi site.

3.14 Water Supply and Conservation

This section provides baseline information regarding water supply and conservation in the vicinity of the Fermi site.

3.14.1 General Water Supply Status and Issues

The ER and FSAR provide background information on water use at the Fermi site and within its vicinity. This information establishes a baseline from which to assess the impact of Fermi 3 construction and operational activities regarding water supply and conservation.

As indicated in the ER and FSAR subsections identified and summarized below, there are no indications of inadequate water supply availability at the site or competition with other potential users for water supply needs:

- ER Subsection 2.3.1.2.1.3, Onsite Use, which contains general statements about the onsite use of water at the Fermi site.
- ER Subsection 2.3.2, Water Use, and the associated tables, which includes a detailed presentation of water use in the Fermi 3 vicinity.
- FSAR Subsection 2.4.1.2.8, Surface-Water Use, and the associated tables, which presents information on surface water use in the Fermi 3 vicinity.

3.15 Energy Needs and Energy Conservation and Development

This section provides baseline information regarding energy needs and energy conservation and development within the state of Michigan.

3.15.1 Energy Needs and Energy Generation Development

Refer to ER Chapter 8, Need for Power, and associated tables and figures, for a discussion of the existing need for power and development of new electric generating facilities. In general, the discussion within ER Chapter 8 presents the following:

- Section 8.1 – Description of the power system, an overview of the pertinent service area, and a discussion of regional relationships.
- Section 8.2 – Description of the analysis performed to determine current and forecasted energy needs in the state of Michigan.

- Section 8.3 – Description of the analysis performed to determine energy supply resources.
- Section 8.4 – Description of the assessment of the need for power.

The need for power assessment is derived from the Plan (Reference 1.3-1). The Plan was prepared and issued by the Michigan Public Service Commission pursuant to Executive Directive No. 2006-02. The Plan reached several significant conclusions, including the following:

- Michigan's peak electric demand is forecasted to grow at approximately 1.2 percent per year for the next 20 years.
- There is a need for additional electric generating resources in order to preserve electric reliability and provide affordable energy over the next 20 years. This modeling outcome is confirmed even with the increased use of energy efficiency and renewable resources.
- The projected electric demand will not be satisfied through the expansion of transmission or via access to external markets.
- There is a need for regulated baseload capacity to prevent natural gas prices from driving up wholesale costs and market prices for an increasing number of hours each year.

3.15.2 Energy Conservation

Refer to ER Section 8.2, Power Demand, for a discussion of factors that can affect growth of energy demand, including conservation, forecasting uncertainties, and energy efficiency. Specifically, refer to ER Subsection 8.2.2.2, Energy Efficiency and Conservation, for a discussion on how the Plan incorporates energy efficiency considerations.

3.16 Land Use

This section provides baseline land use information regarding the area surrounding and on the Fermi site.

As stated in ER Section 2.2, Land, the baseline land use analysis was based on a review of appropriate existing literature, information acquired through visits to the Fermi site and contact with staff members, and information from local planning and agricultural contacts.

3.16.1 Land Use within the Region

Refer to ER Subsection 2.2.3, The Region, for information regarding land use within the 50-mi. region surrounding the Fermi site.

3.16.2 Land Use within the Project Area

Refer to ER Section 2.1, Station Location, for information regarding the Fermi site's geographic location.

Refer to ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1 and its associated figures, for information regarding the existing land use characteristics of the Fermi site.

Refer to the following ER subsections and associated figures for information regarding the land use around and on the Fermi site:

- Subsection 2.2.1.2.1, Site Accessibility.
- Subsection 2.2.1.2.2, Local Communities.
- Subsection 2.2.1.2.3, Land Use and Planning, including Subsection 2.2.1.2.3.1 Agricultural Land Use.
- Subsection 2.2.1.2.4, Viewshed.
- Subsection 2.2.1.2.5, Natural and Recreational Areas.
- Subsection 2.2.1.2.6, Water, Rail, and Air Transportation.
- Subsection 2.2.1.2.7, Pipelines.

Refer to the following ER subsections, tables, or figures for information regarding land use in or near the transmission corridors:

- Subsection 2.2.2.1, Existing Transmission Routes and Land Use.
- Subsection 2.2.2.2, Proposed Transmission System Modifications and Land Use.
- Subsection 2.2.3.3, Regional Transmission Lines and Pipelines.
- Table 2.2-1, Acreage Associated with Land Uses on the Fermi Site.
- Table 2.2-5, Land Use Within Existing Transmission Corridors.
- Table 2.2-6, Land Use Within 0.5-mile of Fermi Transmission Lines.
- Figure 2.2-3, Land Use in Existing and Proposed Transmission Corridor Areas (within 0.5 mile).
- Subsection 4.1, Land Use Impacts.
- Subsection 4.7.1, Land Use, as revised by NRC RAI GE3.1-1.
- Subsection 5.11.1, Land Use, as revised by NRC RAI GE3.1-1.
- Subsection 6.5.1, Terrestrial Ecology and Land Use.
- Subsection 10.2.1.1, Land Use Productivity.

As stated in response to NRC RAI LU4.4.2-1, Detroit Edison does not currently harvest timber for commercial use, and has no plan to do so in the future.

As indicated in ER Section 2.2, Land, the baseline land use evaluation concluded that the land use characteristics near Fermi 3 have not changed significantly since the construction of Fermi 2, and they are not expected to change substantially during the time frame associated with the review of the COL application.

3.17 Food and Fiber Production

This section provides baseline information regarding the food and fiber production of the area surrounding the Fermi site and the associated aquatic ecosystems.

3.17.1 Regional Overview

Refer to ER Subsection 2.2.1.2, The Vicinity, and Subsection 2.2.1.2.3.1, Agricultural Land Use, for a description of the food production areas surrounding the Fermi site. ER Subsection 2.2.3.1, Regional Land Use, and ER Table 2.2-8, Average Annual Yields for Major Agricultural Products of the Fermi Region, present data on major food crop production for the 50-mi. region around the Fermi site.

3.17.2 Food and Fiber Production Associated with the Project Area

The food production of the aquatic ecosystem at the Fermi site is primarily characterized by the commercial and recreational fishing taking place in Lake Erie. The following subsection provides a baseline assessment of the commercial and recreational fishing taking place in Lake Erie near the Fermi site.

3.17.2.1 Aquatic Food and Fiber Production

Refer to ER Subsection 2.4.2.3, Commercial and Recreational Fisheries, for a description of the commercial and recreational fishing that takes place in the water bodies within the vicinity of the Fermi site. ER Appendix 2A, Life Histories of Aquatic Species, provides detailed information on fish and other aquatic species regarding any critical life-support requirements, such as spawning areas, nursery grounds, food habits, feeding areas, wintering areas, and migration routes. Refer to ER Subsection 2.5.4.1, Methodology, for a description of the subsistence fishing activities in the vicinity of the Fermi site. As stated in ER Subsection 2.5.4.1, there is no indication that subsistence fishing activities occur on or near the site.

3.18 Mineral Needs

This section provides baseline information regarding both long- and short-term usage/mining of minerals on and around the Fermi 3 site and how these activities may affect the mineral needs of the public.

3.18.1 Mineral Rights of the Fermi 3 Site

Refer to ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, for information regarding mineral rights and mineral usage potential in the vicinity of the Fermi site. Detroit Edison owns 99.93 percent of the mineral rights to the Fermi 3 site. The MDNR owns the remaining 0.07 percent (0.88 ac.) of mineral rights in the far southeast corner of the Fermi 3 site.

3.18.1.1 Mineral Mining in and Around the Fermi 3 Site

ER Figure 2.1-4, Fermi 3 Site Plan, as revised by NRC RAI GE3.1-1, displays an overview of the entire Fermi facility, including proposed locations of buildings and other points of interest at the Fermi site. Refer to ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, for a baseline description of the mineral resources on or near the Fermi 3 site. ER Subsection 2.2.1.1 explains that no mineral production currently exists at the facility, nor is any anticipated in the future because of the site geology.

3.18.2 Mineral Production and Its Effect on Water Quality

Refer to ER Subsection 2.3.1.2.2.1, Present Groundwater Use, and Figure 2.3-21, Quarries of Monroe County, Michigan, for an illustration of all of the quarries in Monroe County and their proximity to Fermi 3. ER Figure 2.3-21, Quarries of Monroe County, Michigan, depicts an onsite quarry at the Fermi site. The quarry, now known as Quarry Lakes, was used to supply foundation material for Fermi 1 and Fermi 2 and is no longer in use for quarrying materials.

3.19 Water Quality

This section provides baseline information regarding water quality in the vicinity of the Fermi site.

3.19.1 General Water Quality Status and Issues

The ER and FSAR provide background information on water quality at the Fermi site and within its vicinity. This information establishes a baseline from which to judge the impact of Fermi 3 construction and operation regarding water quality.

As noted in the ER subsections and table identified and summarized below, there are no indications of exceedances of water quality standards in Lake Erie related to Fermi operations or any indications of impacts on other potential water users:

- Subsection 2.3.1.1, Surface-Water Resources, which includes general statements about surface water resources and Lake Erie as a large water system compared to the water use quantity for Fermi 3. This subsection describes the hydrological cycle of the Great Lakes and Lake Erie, including the interconnection of many sources, as a background to understanding water quality in the Fermi area.
- Subsection 2.3.3, Water Quality, as revised by NRC REI AE2.2-4, which contains general information about surface water quality and Lake Erie water quality. This subsection presents a discussion of surface water quality and trends and notes that the most significant regional water quality parameters in Lake Erie include nutrient enrichment, pesticide contamination, sedimentation, organo-chlorine compounds, mercury, and polychlorinated biphenyls. Of these parameters, the only parameter potentially related to past Fermi operations or future Fermi 3 activities is sediment. During construction, the Fermi 3 project could cause sediment or dust to enter Lake Erie. However, significant plans and measures are in place, as discussed in ER Subsection 4.2.1.9, Hydrologic Alteration Best Management Practices and Measures, to minimize the impacts of construction and sediment on water quality.
- Table 2.3-43, Lake Erie Sample Results from the Vicinity of the Fermi Site, August 2007, which presents background water quality data from Lake Erie in the vicinity of the Fermi site in August 2007. This table provides an example of water quality in the project vicinity for a variety of parameters.
- Subsection 5.3.2.2.2, Chemical Impacts, which includes a summary statement as quoted: "Fermi 2 has maintained consistent compliance with this suite of effluent limits and the relevant regulatory parties have been satisfied that they are consistent with the relevant rules and the protection of water quality of both Swan Creek and Lake Erie." This indicates that past Fermi site operations have been protective of Lake Erie water quality.

3.20 Consideration of Property Ownership

This section provides baseline information associated with property ownership at the Fermi site.

3.20.1 Property Ownership

Refer to ER Subsection 1.1.1, Ownership and Applicant, and Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, for information concerning Detroit Edison's status as the owner and operator of the Fermi site. ER Subsection 2.2.1.1 and the associated figures and tables also provide property information, such as the site's size, property boundary, and dominant structures and uses.

3.20.2 Onsite Structures to Prevent Soil Erosion

Refer to Section 3.13 of the USACE Report and the referenced sections of the ER for information regarding structures placed on the Fermi site to prevent soil erosion.

3.20.3 Navigability of Area Waters

Refer to Section 3.8 of the USACE Report and the referenced sections of the ER and FSAR for information regarding navigability of area waters.

3.20.4 Presence of Federal Projects within the Area

Refer to ER Section 2.8, Related Federal Project Activities, for a discussion of those federal project activities directly related to Fermi 3. Specifically, ER Subsection 2.8 includes a review of the federal project activities that would affect land acquisitions or use, plant siting and water supply, construction or operation of Fermi 3, or the need for power.

Refer to the ER subsections for information regarding federal or other projects potentially affecting the Fermi 3 project:

- Subsection 2.8.1, Federal Actions Related to Land Acquisitions or Use Affecting Fermi 3 Project.
- Subsection 4.3.1.5.5, Other Projects Within the Area with Potential Impacts.
- Subsection 5.6.1.6, Other Projects Within the Area with Potential Impacts.

Table 3.8-1 Port of Monroe Shipping Facilities

Inner Channel	200 ft wide x 8,200 ft long
Outer Channel	300 ft wide x 15,800 ft long
Channel Depth	21 ft
Turning Basin	22 ac. at 18 feet deep 2,250 ft of frontage on turning basin

Table 3.8-2 Toledo Harbor Channel Depths

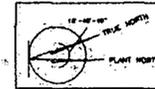
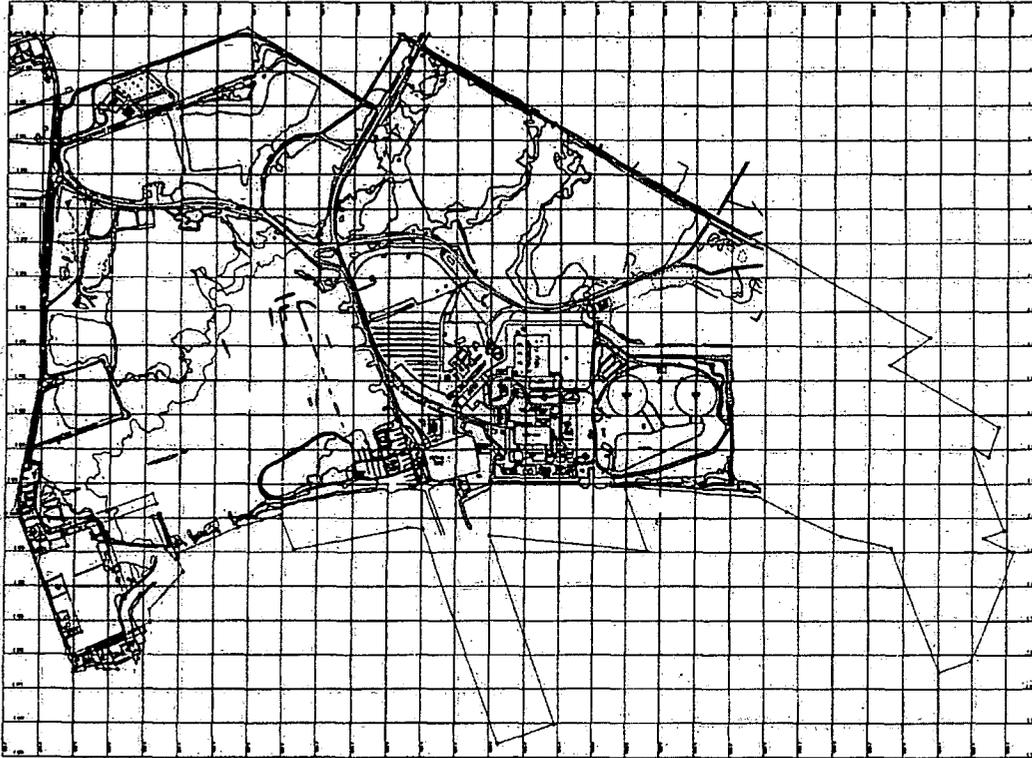
Name of Channel	Project Width (feet)	Project Length (nautical miles)	Project Depth (feet)
Entrance Channel to Buoy 49	500	18	28
Maumee Mooring Basin	450	1.4	28
Buoy 62 Maumee River Channel	400	2.65	27
Riverside Turning Basin	400	2.65	27
Buoy 67 Turning Basin	260 - 630	0.27	27
Upstream Limit of Project – Turning Basin	835	0.15	18

Reference 3.8-2.

Table 3.8-3 Detroit River Channel Depths

Name of Channel	Project Width (feet)	Project Length (nautical miles)	Project Depth (feet)
Fighting Island Channel	800	4.7	28.5
Ballards Reef Channel	600	3.5	27.5
Livingstone Channel from Light D77 to 42°05'35"N 83°07'45"W	450	3.1	27.7
Livingstone Channel from 42°05'35"N 83°07'45"W to 42°04'07"N 83°07'56"W	450	1.7	27.7
Livingstone Channel from 42°04'7"N 83°07'56"W to 42°03'08"N 83°08'05"W	450 - 800	1.1	27.7
Livingstone Channel from 42°03'08"N 83°08'05"W to Light D30	800	1.7	29.0
Amherstburg Channel from Light D71 to Light Buoy D56 to Light D30	600	2.4	Right Half 21.0 Left Half 27.5
Amherstburg Channel from Light Buoy D56 to Light D30	600 - 700	4.5	Right Half 21.0 Left Half 28.5
Livingstone Channel from Light D30 to 42°00'20"N 83°08'25"W	1200	1.5	29.0
East Outer Channel	1200	7.5	28.5
West Outer Channel	800	4	22.0

Figure 3.10-1 Circulating Water System Reservoir



NOTES:
THIS DRAWING WAS PREPARED FROM
CARTOGRAPHY'S GENERAL YARD MAP
FILES AND AERIAL PHOTOGRAPHY
DATED MAY 1985. ANY CHANGES
OR REVISIONS SHALL BE REFERRED
TO THE ARCH/CIVIL DIVISION
OF GENERATION ENGINEERING DEPARTMENT.

ALL PREVIOUS REVISIONS TO THIS
DOCUMENT HAVE BEEN APPROVED
BY DETROIT EDISON AND ARE ON
MICROFILM IN DOCUMENT CONTROL.

THIS DRAWING WAS UPDATED TO DELETE DETAILS
OF FERM1 1 DUE TO DECOMMISSIONING
ACTIVITIES.

Fermi 2 UPDATED FINAL SAFETY ANALYSIS REPORT
FIGURE 1.2-5 SITE PLOT PLAN

REV 13 06/05

DETROIT EDISON COMPANY DRAWING NO. 50721-210Z, REV. N

Figure 3.10-2 Circulating Water System Reservoir (Aerial)



Enrico Fermi II
Circulating Water Pond, Circulating Water
Pumphouse 9-28-78: 721-10628

Chapter 4 Analysis of Beneficial and Detrimental Impacts on the Environment and Public Interest, and Information Assisting in the Factual Determinations Required under CWA Section 404(b)(1) for the Fermi Site

4.1 Assessment of Impacts

33 CFR Section 320.4(a) states that the decision of whether to issue a permit is to be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. It requires that all factors that may be relevant to the proposal be considered. For completeness, the following subsections discuss and concisely assess the impacts on all public interest factors listed within 33 CFR 320.4(a). This impact assessment was significantly based on the assessment contained within the ER and responses to relevant NRC RAIs, including the response to NRC RAI GE3.1-1, which provides proposed revisions to the ER based on the site arrangement.

4.2 Conservation and Overall Ecology

The following subsections provide an assessment of the proposed project's expected impacts on conservation and general ecology during the construction and operation of Fermi 3, discuss the potential need for mitigation or monitoring to protect this public interest factor, and identify expected cumulative impacts on the conservation and general ecology of the Fermi area.

4.2.1 Direct and Indirect Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on conservation and general ecological characteristics of the Fermi site and surrounding vicinity. The following subsections provide or reference the ER's assessment of expected Fermi 3 construction and operational impacts concerning the following areas:

- Areas with Natural Heritage Value.
- Federal and State Threatened and Endangered Species.
- Migratory Birds.
- Wetlands.
- Floodplains.
- Fish Spawning and Cover Areas.
- Construction Management Activities Related to Petroleum Products.

4.2.1.1 Construction

ER Section 4.3, Ecological Impacts of Construction, describes the potential impacts of Fermi 3 construction on the ecological resources at the Fermi site and within a 7.5-mi. radius area around the site.

4.2.1.1.1 Areas with Natural Heritage Value

Refer to Section 3.3 of the USACE Report for a discussion of those areas on and around the Fermi site that exhibit characteristics of natural heritage value. Of particular importance are expected impacts on those areas of the Fermi site that are included within the DRIWR.

Refer to ER Subsections 4.1.1.2.3, Federal, Regional, and State Land Use Plans and 4.3.1.2.2, Important Habitats, as revised by NRC RAI GE3.1-1, for an assessment of DRIWR impacts resulting from Fermi 3 construction. As indicated in ER Subsection 4.1.1.2.3, although Fermi 3 construction would reduce the acreage that could be included in the DRIWR, Fermi 3 construction would be compatible with the plans and agreements governing the DRIWR. Therefore, the proposed work would not degrade or foreclose the majority of the area from preservation.

4.2.1.1.2 Federal and State Threatened and Endangered Species

As stated in ER Subsection 4.3.1.2, Important Terrestrial Species and Habitats, no federally protected plant or animal species or designated critical habitat, listed by the USFWS under the ESA, would be affected by construction activities associated with Fermi 3. The bald eagle, protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, may be impacted by project activities. Appropriate protective measures would be implemented during the construction of Fermi 3 to provide protection as necessitated by the two federal Acts.

Two Michigan-listed species, the eastern fox snake and the American lotus, are present at the Fermi site. These protected species may be affected and preventive measures to ensure the continued existence of these species on the site would be coordinated with MDEQ. Refer to ER Subsection 4.3.1.2 and associated subsections for an assessment of the expected impacts of Fermi 3 construction on federal and state protected species.

As stated in ER Subsection 4.3.2.4.1, Threatened and Endangered Species, no threatened and endangered aquatic species were observed or recorded as being located onsite, with the exception of the American lotus. For the purposes of this and associated reports, the American lotus is treated as a terrestrial species. In summary, there are no expected impacts on threatened and endangered aquatic species resulting from Fermi 3 construction activities.

4.2.1.1.3 Migratory Birds

Refer to ER Subsection 4.3.1.2.1, Important Species, as revised by NRC RAI GE3.1-1, for an assessment of the expected impacts of Fermi 3 construction activities on the bald eagle.

4.2.1.1.4 Wetlands

Refer to Section 4.5 of the USACE Report for an assessment of the expected impacts on wetlands resulting from Fermi 3 construction activities.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for information on wetland impacts related to transmission line construction.

4.2.1.1.5 Floodplains

Refer to Section 4.11 of the USACE Report for an assessment of the expected impacts on floodplains resulting from Fermi 3 construction activities.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for information on floodplain impacts related to transmission line construction.

4.2.1.1.6 Fish Spawning or Cover Areas

Refer to ER Subsection 4.3.2.4.2, Commercial and Recreational Aquatic Species, for an assessment of possible interruptions to fish migration and spawning related to Fermi 3 construction activities. As stated in ER Subsection 4.3.2.4.2, interruptions of fish migration and spawning, and fish mortality related to accidental toxic spills, are unlikely to occur from Fermi 3 construction activities. This is attributable to the implementation of the appropriate spill prevention measures detailed in the Pollution Incident Prevention Plan (PIPP). As indicated in ER Subsection 4.3.2.5, Summary, any small spills of construction-related hazardous fluid would be mitigated in accordance with the PIPP. Impacts on aquatic communities from construction activities are expected to be minor.

Refer to ER Subsections 4.3.2.3, Impact to the Transportation Corridors and Offsite Areas; and 5.6.2, Aquatic Ecosystems, for information on aquatic system impacts from the transmission corridors.

4.2.1.1.7 Construction Management Activities Related to Petroleum Products

The proposed construction and subsequent operation of Fermi 3 could lead to gasoline or oil spills, which could cause impacts. However, impacts from spills are expected to be minimized due to the implementation of the PIPP for the Fermi 3 site. Refer to ER Subsection 4.2.1, Hydrologic Alterations, for a description of the requirement for the PIPP.

Refer to ER Subsection 5.1.2.4, Spills, for preventive measures related to oil spills during transmission line construction.

4.2.1.2 Operation

Impacts associated with the operation of Fermi 3 are assessed within ER Chapter 5, Environmental Impacts of Operation. Assessments associated with Fermi 3 expected impacts on conservation and general ecological resources during operation are discussed below.

4.2.1.2.1 Areas with Natural Heritage Value

Refer to ER Subsection 5.1.1, The Site and Vicinity, for an assessment of the expected impacts on land use resulting from Fermi 3 operation. ER Subsection 5.1.1 indicates that there would likely be positive impacts on the natural areas during Fermi 3 operation, as the disturbance from construction is restored to wildlife habitat. Refer also to ER Subsection 2.8.1, Federal Actions Related to Land Acquisitions or Use Affecting Fermi 3 Project, which indicates that Detroit Edison intends to return all available and applicable wetlands to the DRIWR following the completion of Fermi 3 construction activities.

Refer to ER Subsections 5.6.1.3, Important Terrestrial Species and Habitats and 5.6.1.4, Wetlands and Floodplains, for information regarding areas with natural heritage value in the transmission corridors.

4.2.1.2.2 Federal and State Threatened and Endangered Species

Refer to ER Subsection 5.3.1.2.3, Principal Aquatic Resources, for an assessment of the expected impacts on important aquatic species, as defined by NUREG-1555, including threatened and endangered species resulting from Fermi 3 operation. ER Subsection 5.3.1.2.3 indicates that the Fermi 3 intake system is expected to have insignificant impacts on federally listed and state-listed threatened and endangered species, and no mitigation measures would be needed.

Refer to ER Subsection 5.3.3.2, Terrestrial Ecosystems, for an assessment of the expected impacts of Fermi 3 operation on important terrestrial species and habitats, as defined by NUREG-1555.

Refer to the following ER subsections for information on impacts to federal or state endangered and threatened species in the transmission corridors:

- Subsection 4.3.2.3.2, Important Aquatic Species.
- Subsection 4.3.2.3.3, Important Habitats.
- Subsection 5.6.1.3, Important Terrestrial Species and Habitats.

4.2.1.2.3 Migratory Birds

Refer to ER Subsection 5.3.3.2.7, Avian Collisions, for an assessment of expected impacts on birds resulting from collisions with onsite structures. As indicated in ER Subsection 5.3.3.2.7, the expected impacts on bird species from collisions with the cooling tower are expected to be minor and would not warrant mitigation.

Refer to ER Subsection 5.6.1.2, Wildlife for an impact assessment of bird collisions related to the transmission conductors and the Milan substation.

4.2.1.2.4 Wetlands

Refer to Section 4.5 of the USACE Report for an assessment of the expected impacts on wetlands resulting from Fermi 3 operation.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for information on anticipated impacts to wetlands from transmission line operation, including periodic maintenance.

4.2.1.2.5 Floodplains

Refer to Section 4.11 of the USACE Report for an assessment of the expected impacts on floodplains resulting from Fermi 3 operation.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for information on anticipated impacts to floodplains from transmission line operation, including periodic maintenance.

4.2.1.2.6 Fish Spawning or Cover Areas

Refer to ER Subsection 5.3.2.2.1, Thermal Impacts, for an assessment of the expected impacts of the Fermi 3 wastewater discharge on fish spawning. ER Subsection 5.3.2.2.1 indicates that the impacts on organisms as a result of additional thermal discharges associated with Fermi 3 are expected to be minor, and mitigation measures would not be required.

Refer to ER Subsection 5.3.1.2.3.2, Fish, for a discussion regarding the use of the Fermi intake bay as a haven or cover area for fish during the winter months. ER Subsection 5.3.1.2.3.2 indicates that the co-location of the Fermi 3 intake with the existing intake structure would result in expected minor impacts on fish resources at the Fermi site.

Refer to ER Subsection 5.6.1.5, Impact of Electromagnetic Fields on Flora and Fauna, for an assessment of effects on flora and fauna related to the transmission lines. ER Subsection 5.6.1.5, Impact of Electromagnetic Fields on Flora and Fauna, indicates that any impacts are anticipated to be minor.

4.2.1.2.7 Operational Management Activities Related to Petroleum Products

Refer to ER Subsection 5.11.3.4, Groundwater Quality, for an assessment of the expected impacts of Fermi 3 operation on groundwater quality. This assessment includes operational prevention and management programs that would minimize opportunities for groundwater impacts. These programs include the SWPPP and Spill Prevention, Control, and Countermeasure (SPCC) Plan/PIPP.

ER Subsection 5.1.2.5, Maintenance Activities describes typical maintenance for transmission lines expected to be used on the Fermi 3 transmission lines to be owned by ITC Transmission. Refer to ER Subsection 5.1.2.4, Spills, for information regarding spill prevention and response in the transmission corridors.

4.2.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on conservation and ecology.

4.2.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.4, Ecology, for an assessment of the expected cumulative impacts on aquatic and terrestrial ecosystems related to station construction. Refer to the following ER subsections for additional details:

- Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 4.7.4.2, Aquatic Ecology, as revised by NRC RAI GE3.1-1.

As indicated in ER Subsection 4.7.4.1, the expected cumulative impacts of construction activities are expected to remain minor relative to terrestrial ecology. As indicated in ER Subsection 4.7.4.2, Aquatic Ecology, the expected cumulative impacts on aquatic resources from Fermi 3 construction activities would be minor.

Refer to the following ER subsections and table for expected cumulative impacts from transmission line construction:

- Subsection 4.7.1, Land Use, as revised by NRC RAI GE3.1-1.
- Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 4.7.4.2, Aquatic Ecology.
- Subsection 4.7.6, Non-Radiological Health.
- Table 4.8-1, Summary of Construction and Pre-Construction Related Impacts, as revised by NRC RAI GE3.1-1.

4.2.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.4, Ecology, for an assessment of the expected cumulative impacts on aquatic and terrestrial ecosystems related to station operation. Refer to the following ER subsections for additional details:

- Subsection 5.11.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 5.11.4.2, Aquatic Ecology, as revised by NRC RAI GE3.1-1.

As indicated in the revised ER Subsection 5.11.4.1, operational impacts on terrestrial resources are expected to be minimal because zoning, various permit conditions, and other regulatory requirements control land use minimize environmental impacts.

As indicated in the revised ER Subsection 5.11.4.2, operational impacts on aquatic resources are expected to be minor and would not warrant further mitigation.

Refer to the following ER subsections for information on expected cumulative impacts related to transmission line operation.

- Subsection 5.11.1, Land Use, as revised by NRC RAI GE3.1-1.
- Subsection 5.11.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 5.11.4.2, Aquatic Ecology.

4.2.3 Mitigation and Monitoring

Refer to ER Section 6.5, Ecological Monitoring, for information regarding ecological monitoring for terrestrial ecology and aquatic ecology. As stated in ER Section 6.5, monitoring programs aimed at the detection of changes to the terrestrial and aquatic ecosystems began before the COL application submittal and will continue during site preparation, construction, and operation of Fermi 3. Refer to the following ER subsections for additional details:

- Subsection 6.5.1, Terrestrial Ecology and Land Use.
- Subsection 6.5.2, Aquatic Ecology.

In addition, refer to ER Section 6.6, Chemical Monitoring, for information regarding chemical monitoring programs to control and minimize adverse impacts on water quality resulting from the construction and operation of Fermi 3.

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a listing of the specific actions to limit Fermi 3 construction impacts and any necessary mitigative actions, including the transmission corridors.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a listing of the specific mitigative actions associated with the expected impacts resulting from Fermi 3 operation, including the transmission corridors.

Refer to ER Table 5.10-1, Summary of Measures and Control to Limit Adverse Impacts During Operation, for a listing of measures and control applied to mitigation impacts related to operation of the transmission lines.

4.3 Economics

The following subsections provide an assessment of the proposed project's expected impact on economics during the construction and operation of Fermi 3, discuss the potential need for mitigation or monitoring to protect this public interest factor, and identify the expected cumulative impacts on the economics of the Fermi area.

4.3.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on the economic characteristics of the Fermi site and the surrounding vicinity.

4.3.1.1 Construction Impacts

As stated in ER Subsection 4.4.2, Social and Economic Impacts, as revised by NRC RAI SE4.4.2-6, new investment in a major construction project has multiple positive, economic impacts driven by employment and income creation, plus increased tax revenues. As indicated in ER Subsection 4.4.4, Summary, the negative environmental impacts during construction of Fermi 3 are largely minimized by the use of an existing and relatively remote site. The utilization of routine construction procedures will further minimize the potential for negative impacts. The socioeconomic benefits of the project will be major and positive in the areas of employment, income generation, and tax benefits.

4.3.1.1.1 Employment

Refer to ER Subsection 4.4.2.4.6, Local Employment and Income and the associated tables, for an assessment of the expected workforce associated with Fermi 3 construction. As indicated in ER Subsection 4.4.2.4.6, Fermi 3 construction is expected to result in a major, positive impact on employment and income within the primary impact area counties (Monroe County and Wayne County, Michigan and Lucas County, Ohio).

4.3.1.1.2 Tax Revenues

Refer to ER Subsection 4.4.2.3, Regional Tax, as revised by NRC RAI SE4.4.2-6, for a discussion of the tax revenues to be generated during Fermi 3 construction. In summary, ER Subsection 4.4.2.3, as revised by NRC RAI SE4.4.2-6, assessed the expected positive tax revenue impacts associated with Fermi 3 construction as follows:

- Approximately \$553 million in wages will be paid to local construction workers over the Fermi 3 construction period.
- Approximate generation of \$10.5 million in state (Michigan and Ohio) income tax generated from the local workforce.
- Substantial increases in direct local sales taxes generated by local purchases of construction materials and supplies.
- Approximate generation of \$18.7 million in indirect sales taxes.
- Incremental increases in property taxes revenue as Fermi 3 construction phase progresses.

As indicated above, refer to the response to NRC RAI SE4.4.2-6 for the revised and updated construction cost estimates, reporting preconstruction and construction activities and expenditures separately, and reporting planning expenditures for supplies and materials within the local area versus outside sources.

Refer to the response to NRC RAI SE4.4.2-7 for a list of job categories and wages/salaries of the Fermi 3 construction and operations workforce.

As indicated in the above points, it is expected that contractors, equipment suppliers, and other commercial enterprises would benefit from the direct sales made as a result of Fermi 3 construction activities. Additionally, the increased use of the Fermi site is expected to benefit local business through direct sales of construction-related materials and indirect sales. Therefore, it is expected that a major positive impact on tax revenues and local business would result from Fermi 3 related construction activities.

4.3.1.1.3 Community Services

Refer to ER Subsection 4.4.2.4, Local Public Services, for an assessment of the expected impacts on local public services resulting from Fermi 3 construction activities. ER Subsections 4.4.2.4.1 through 4.4.2.4.6 evaluate the potential impacts of the Fermi 3 workforce on the primary impact area counties. The impacts assessed within these ER subsections, including those related to community services, are as follows:

- Subsection 4.4.2.4.1, Education.
- Subsection 4.4.2.4.2, Transportation, as revised by NRC RAI TR4.8.3-2 and NRC RAI SE4.4.2-10.
- Subsection 4.4.2.4.3, Public Safety and Social Services.
- Subsection 4.4.2.4.4, Public Utilities.
- Subsection 4.4.2.4.5, Recreation, Tourism, Aesthetics, and Land Use.
- Subsection 4.4.2.4.6, Local Employment and Income.

Refer to the response to NRC RAI SE4.4.2-10 for the Level of Service analysis/traffic study. The Level of Service analysis/traffic study provides the following information:

- Carrying capacity and condition of roads and highways during construction, operation, and outage periods.
- Relevant transportation and traffic information in Michigan and Ohio.
- Availability and types of public transportation.
- Proposed road modifications that may affect traffic flow to and from the Fermi site.
- Hourly present and future rates of worker flow through Fermi security gates.

In summary, ER Subsection 4.4.2.4, as revised by NRC RAI SE4.4.2-10 and NRC RAI TR4.8.3-2, indicates that minor impacts on public services are generally expected as a result of Fermi 3 construction activities. The exception is the significant increase in area earnings as a result of employment during Fermi 3 construction.

Refer to ER Subsection 5.6.3, Impacts to Members of the Public and the related subsections, for an assessment of impacts to the public related to transmission line construction and operation.

4.3.1.1.4 Property Values

Refer to ER Subsection 4.4.2.3, Regional Tax, for a discussion of the expected increased assessment of value during each year of Fermi 3 construction.

4.3.1.1.5 Environmental Justice

Refer to ER Subsection 4.4.3, Environmental Justice Impacts, for a discussion of the expected impacts on low-income and minority populations from Fermi 3 construction.

As indicated in ER Subsection 4.4.3.1, Impacts on Low Income Areas, the expected impacts of Fermi 3 construction are almost wholly positive and beneficial to the region. Generally, low-income populations can be assumed to benefit from these impacts to a comparable degree as other regional populations. Therefore, low-income populations are not expected to experience a disproportionate amount of negative impacts. Instead, low-income populations are expected to experience proportionate positive economic benefits as compared to the general population.

As indicated within ER Subsection 4.4.3.2, Impacts on Minority Populations, the expected impacts of Fermi 3 construction on minority populations' health and culture are minor or nonexistent. Therefore, if any negative impacts would occur to minority populations, they are expected to be minor and short term.

4.3.1.2 Operational Impacts

Refer to ER Section 5.8, Socioeconomic Impacts, for an assessment of the socioeconomic impacts of Fermi 3 operation on the region and, in particular, the primary impact area consisting of Monroe, Wayne, and Lucas counties. Refer to ER Subsection 5.8.4, Summary, for a discussion of the expected socioeconomic impacts associated with the operation of Fermi 3. ER Subsection 5.8.4 indicates that there is generally a lack of significant negative socioeconomic impacts that would result from Fermi 3 operation because of the disbursement of the population and housing impacts over a large and populated area that already has a well developed infrastructure. However, moderate and intermittent traffic impacts may result during operation as a result of refueling outages. ER Subsection 5.8.4 also indicates that the operation of Fermi 3 would create major, long-term, and positive socioeconomic benefits related to employment, income, and community services.

4.3.1.2.1 Employment

Refer to ER Subsection 5.8.2.7, Local Employment and the associated table, for an assessment of the effects of Fermi 3 operation on local employment. As stated in ER Subsection 5.8.2.7, 900 full-time operating positions for Fermi 3 would create direct economic benefits for the region. A periodic maintenance staff would also be required to support the refueling; this requirement would provide additional direct employment and wage benefits. In addition to the direct operational and maintenance workforce, there would be secondary or indirect jobs created on a long-term basis because of the economic multiplier effects of Fermi 3 operation. Refer to the response to NRC RAI SE4.4.2-7 for a list of job categories and wages/salaries of the Fermi 3 construction and operations workforce. As a result, the expected impacts of Fermi 3 operation on employment would be major, long term, and positive.

4.3.1.2.2 Tax Revenues

Refer to ER Subsection 5.8.2.3, Tax Payments, for an assessment of tax payments generated from the operation of Fermi 3. The types of tax payments resulting from Fermi 3 operation include property taxes and sales taxes. ER Subsection 5.8.2.3 indicates that the addition of Fermi 3 would significantly increase the local tax revenues over the long term and would result in a much smaller cost burden for residents compared to a scenario in which Fermi 3 is not placed in-service. Therefore, the expected impacts on tax revenues from Fermi 3 operation would be major, long term, and positive.

4.3.1.2.3 Community Services

Refer to ER Subsection 5.8.2.4, Local Public Services, for an assessment of the expected impacts on local public services resulting from Fermi 3 operation. ER Subsections 5.8.2.4.1 through 5.8.2.4.3 evaluate the potential impacts of the Fermi 3 operations workforce on the primary impact area counties. The impacts assessed within these ER subsections are as follows:

- Subsection 5.8.2.4.1, Education.
- Subsection 5.8.2.4.2, Transportation, as revised by NRC RAI TR4.8.3-2.
- Subsection 5.8.2.4.3, Public Safety.

ER Subsection 5.8.2.4 indicates that the expected overall impacts of Fermi 3 operation on public services and facilities would be minor.

4.3.1.2.4 Property Values

Refer to ER Subsection 5.8.2.3, Tax Payments, for a discussion of property taxes or payments in lieu of taxes associated with Fermi 3. As indicated in ER Subsection 5.8.2.3, property taxes or payments in lieu of taxes for Fermi 3 are expected to be by far the most important sources of taxes. Property tax payments will be the subject of negotiations, but will be a significant contributor to the county's revenue. The addition of Fermi 3 will significantly increase the local revenues over the long-term and will result in a much smaller cost burden for residents compared to a scenario in which Fermi 3 is not placed in service.

4.3.1.2.5 Environmental Justice

Refer to ER Subsection 5.8.3, Environmental Justice Impacts, for an assessment of the expected impacts on low-income or minority populations resulting from the operation of Fermi 3. ER Subsection 5.8.3 concludes that the three conditions required for environmental justice impacts are absent for Fermi 3 because (1) low-income or minority populations are not in close proximity to the site, (2) during operation, only small negative cultural, economic, or health impacts are expected, other than traffic impacts near the Fermi site, and (3) low-income and minority populations would not encounter a disproportionate share of any negative impacts from the operation of Fermi 3 because low-income, minority, or subsistence populations are not located near the site.

4.3.2 Cumulative Impacts

The following subsections identify the expected cumulative economic impacts of the construction and operation of Fermi 3 on the area surrounding the Fermi site.

The response to NRC RAI SE5.11-2 provides correspondence and documentation of personal communications used to support the cumulative impact analysis presented in the ER.

4.3.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, for an assessment of the expected cumulative impacts associated with the construction of Fermi 3. ER Subsection 4.7.5 states that socioeconomic impacts of power plant construction are mainly a function of construction workforce size, wages, and the number of relocated workers relative to the available community facilities and services. Aside from Fermi 3, the only other major project identified is the installation of scrubbers at the Monroe Power Plant. However, the bulk of the scrubber installation effort is to be completed before commencement of Fermi 3 construction. Accordingly, no cumulative impact is anticipated regarding the economics of the site vicinity.

4.3.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.4.3, Socioeconomic, Historical and Cultural Resources, for an assessment of the expected cumulative impacts associated with Fermi 3 operation.

4.3.3 Mitigation and Monitoring

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a listing of specific mitigative actions associated with the expected economic impacts resulting from Fermi 3 construction.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a listing of specific mitigative actions associated with the expected economic impacts resulting from Fermi 3 operation.

4.4 Aesthetics

The following subsections assess the proposed project's impact on aesthetics during construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on the aesthetics of the Fermi area.

4.4.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on visual aesthetics. ER Section 3.1, External Appearance and Plant Layout and the accompanying figures, provides a description of the planning, layout, and appearance of Fermi 3. ER Subsection 3.1.2, New Facility Arrangement, as revised by NRC RAI GE3.1-1, provides a listing of the aesthetic principles and concepts used in the design and layout of Fermi 3. The ER figures listed below, contained in the response to NRC RAI GE3.1-1, illustrate the aesthetic impacts associated with the construction and operation of Fermi 3 from the public's perspective from vantage points available to them:

- Figure 3.1-2, View of Fermi Site from Dixie Highway Looking East.
- Figure 3.1-3, View of Fermi Site from Dixie Highway Looking Southeast.
- Figure 3.1-4, View of Fermi Site from Post Road Looking Southeast.
- Figure 3.1-5, View of Fermi Site from Swan Creek Road Looking Southeast.
- Figure 3.1-6, View of Fermi Site from Toll Road Looking East.

- Figure 3.1-7, View of Fermi Site from Pointe Aux Peaux Road Looking North.
- Figure 3.1-8, View of Fermi Site Taken from Pointe Mouille Marsh State Game Area Approximately 6 Miles from Site.

4.4.1.1 Construction Impacts

ER Subsection 4.4.2.4.5, Recreation, Tourism, Aesthetics, and Land Use, states that most of the construction activities will not be visible from beyond the Fermi site. Furthermore, ER Subsection 4.4.2.4.5 indicates that the impacts on aesthetics from construction are expected to be minor, short-term negative impacts.

Fermi 3 construction would be consistent with similar types of structures found currently on the Fermi site. Construction of Fermi 3 is not expected to encourage unplanned and incompatible human access or to destroy vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area as viewed by the public since there is no public access to the site. Fermi 3 construction will result in the construction of structures that extend offshore and the discharge of dredged or fill materials. The construction of offshore structures (e.g., intake structure, outfall structure, and barge facility) and the discharge of dredged or fill material (e.g., discharge of dredged material onsite) will result in localized impacts on the Fermi site's general aesthetics and the aesthetics of the onsite aquatic ecosystem. However, because of the localized nature of the impacts and the public's lack of access to the Fermi site, construction of offshore structures and the discharge of dredged or fill material is not expected to result in aesthetic impairments or obstructions to the public.

Refer to ER Subsection 4.4.2.4.5 for additional information on the limited impact that Fermi 3 construction is expected to have on aesthetics. Refer to ER Subsection 5.6.3.1, Visual Impacts, for additional information on visual impacts related to the addition of transmission lines to the existing transmission corridors.

4.4.1.2 Operational Impacts

Fermi 3 operation is not expected to transform the aesthetics of the area. The Fermi site will remain an area characterized by its use for power generation. ER Subsection 5.8.2.6, Land Use and Aesthetics, indicates that the impacts on aesthetics from Fermi 3 operation are expected to be minor, long-term negative impacts. Refer to ER Subsection 5.8.2.6 for additional information regarding the limited impact that Fermi 3 operation is expected to have on aesthetics. Refer to ER Subsection 5.6.3.1, Visual Impacts, for additional information on visual impacts related to the operation of the additional transmission lines in the existing transmission corridors.

4.4.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on aesthetics.

4.4.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.1, Land Use, as revised by NRC RAI GE3.1-1, for an assessment of the expected cumulative impacts associated with the construction of Fermi 3. ER Subsection 4.7.1 states that the construction of Fermi 3 is not likely to encourage offsite industrial development on a scale similar to the facility, in part due to county and township zoning, which favors preservation of agricultural and rural land use. Therefore, Fermi 3 construction is expected to have minor, short-term negative impacts on the aesthetics of the surrounding area and not encourage additional development on a similar scale that would further degrade the aesthetic environment.

4.4.2.2 Cumulative Impacts of Operation

As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation is not expected to be cumulatively significant relative to impacts of Fermi 2 operation. There are no other existing or planned projects of a similar scale to Fermi 3 in the vicinity that would result in increased negative cumulative impacts on the identified resource areas. Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, for additional information regarding the expected cumulative impacts associated with Fermi 3 operation.

4.4.3 Mitigation and Monitoring

As indicated in ER Subsection 4.4.2.4.5, Recreation, Tourism, Aesthetics, and Land Use, no mitigative measures are required to maintain a minor, short-term negative impact level during Fermi 3 construction; therefore, any permit from the USACE would not require special conditions to protect the aesthetics of the surrounding area.

As indicated in ER Subsection 5.8.2.6, Land Use and Aesthetics, no mitigative measures are required to maintain a minor, long-term negative impact level during Fermi 3 operation; therefore, any permit from the USACE would not require special conditions to protect the aesthetics of the surrounding area.

4.5 Wetlands

Preliminary estimates included up to 169 ac. of impacts on wetlands and open water; refer to Table 2.3-1 and ER Figure 4.3-5, Potential Wetlands Construction Impacts. Based on the completion of the wetland delineation, the original site plan was revised (as communicated to the NRC in an August 26, 2009 letter from Detroit Edison) to reduce permanent impacts to waters of the United States (Reference 1.2-1). Under the Fermi 3 site plan, construction of Fermi 3 would permanently affect 2.75 ac. of wetlands and 7.28 ac. of open water habitats.

Temporary impacts related to Fermi 3 construction are summarized in Table 2.3-2. PEM, PFO, and PSS wetland habitats would be affected. Wetlands and open water areas on the Fermi site that are not directly affected by construction may be indirectly affected by soil erosion and stormwater runoff. The stormwater runoff could include construction materials such as asphalt, concrete, and other materials. Refer to the the following sections of the ER for wetlands impact-related information:

- Subsection 4.1.1.1, Site and Vicinity Land Use Impacts, as revised by NRC RAI GE3.1-1.
- Subsection 4.1.1.2.2, Agricultural and Soil Issues, as revised by NRC RAIs GE3.1-1, HY4.2.1-9, and LU4.1.1-1.
- Subsection 4.2.1, Hydrologic Alterations.
- Subsection 4.2.1.5, Effects of Dewatering.
- Subsection 4.2.1.7, Floodplains and Wetlands.
- Subsection 4.2.2.2, Water Quality of Bodies Receiving Construction Effluents.
- Subsection 4.3.1, Terrestrial Ecosystems, as revised by NRC RAI GE3.1-1.

- Subsection 4.3.1.1.1, Vegetation on the Site and in the Vicinity, as revised by NRC RAI GE3.1-1.
- Subsection 4.3.1.2.2, Important Habitats, as revised by NRC RAI GE3.1-1.
- Subsection 4.3.1.4, Regulatory Consultation.
- Subsection 4.3.2, Aquatic Ecosystems, as revised by NRC RAI GE3.1-1.
- Subsection 4.3.2.1, Impacts to Impoundments and Streams.
- Subsection 4.7.3, Hydrology, Water Use, and Water Quality.
- Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1.
- Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1.

4.5.1 Impacts on Wetland Functions

Refer to ER Subsection 2.4.1.2.3, Habitats, for information regarding the functions assessment of the Fermi site wetlands. Refer to Figure 1.2-22, Potential Wetlands Construction Impacts, for an overview of areas to be affected by construction. A functions and values assessment is provided in the "DTE Fermi II Site, Monroe County Wetland Investigation Report" that was completed by Ducks Unlimited in July 2008, and included within the response to NRC RAI TE2.4.1-6. This assessment found that the principal functions provided by the Fermi wetlands are flood flow alteration, sediment/toxicant retention, nutrient removal, and fish and wildlife habitat. Construction-related impacts on wetland functions will result in reduced performance by these functions until temporary impacts are restored. Because permanent impacts, and the functions lost, would be offset through the Conceptual Mitigation Plan, it is expected that there would be no net loss in wetland function over the life of the project.

4.5.2 Impacts on Wetland Functions on the Fermi Site

The type and extent of wetlands expected to be either temporarily or permanently affected by Fermi 3 activities are provided in Table 2.3-2. Temporarily affected wetland areas would be restored as construction is completed. Based on the acreage of wetlands delineated within the Ducks Unlimited "DTE Fermi II Site, Monroe County Wetland Investigation Report" (provided in the response to NRC RAI TE2.4.1-6 and shown on Figure 1.2-22), less than two percent of the onsite wetlands and open waters would be permanently affected by project activities.

The recognized principal wetland functions of the wetlands on the Fermi site that may be affected, as a result of the temporary and permanent project activities, include flood storage, sediment/toxicant retention, nutrient removal or conversion, and fish and wildlife habitat. The extent and nature of the effect on each function is discussed below.

Flood storage provided by the wetlands on the Fermi site would be reduced as a result of Fermi 3 project activities. The wetland's complex onsite is suitable for reducing impacts caused by flooding through the retaining and gradual release of floodwater following precipitation events.

The sediment/toxicant retention function would be temporarily reduced. However, as stated in ER Subsection 4.1.1.2.2, Agricultural and Soil Issues, as revised by NRC RAI GE3.1-1, NRC RAI HY4.2.1-9, and NRC RAI LU4.1.1-1, site grading and drainage during construction would be designed to avoid erosion during the construction period, in compliance with the SESC Plan, and structural controls may be used to avoid degradation of the quality of the stormwater runoff to Swan Creek,

onsite wetlands, and Lake Erie. Restoration of temporarily affected areas would return the function in these areas.

Nutrient removal or conservation is partially dependent on vegetation density. Refer to ER Subsection 4.3.2.1, Impacts to Impoundments and Streams, for information regarding the function of vegetation that traps silt and sediment associated with the onsite drainage systems, canals, and wetlands.

The wetlands and open waters at the Fermi site serve as habitat for fish and wildlife. Refer to ER Subsection 4.3.1.2.2, Important Habitats, as revised by NRC RAI GE3.1-1, for an assessment of the impacts on the wetlands habitat. Furthermore, as stated in ER Subsection 4.3.2.1, Impacts to Impoundments and Streams, wetland and coastal habitats routinely experience habitat changes associated with heavy rains and flooding events. These episodic events are representative of those expected as a result of surrounding construction activities. The aquatic biota found in these types of habitats are highly adapted to survive in dynamic aquatic regimes and, therefore, can be expected to recover from these effects quickly without significant decreases in overall health and sustainability.

4.5.2.1 Preconstruction Impacts

Refer to ER Chapter 4, Environmental Impacts of Construction, for a description of preconstruction activities. Preconstruction activities will temporarily reduce floodwater storage capabilities. The existing wetland system is adapted to flood reduction through retention and gradual release of floodwaters following precipitation events. In addition, preconstruction activities that remove wetland vegetation or decrease storage and retention will slightly reduce the ability of the Fermi site to retain sediments and remove nutrients until the sites are restored.

4.5.2.2 Construction Impacts

Refer to Figure 1-22, Potential Wetlands Construction Impacts, for an overview of areas to be affected by construction. Refer to ER Chapter 4, Environmental Impacts of Construction for a description of construction activities. Refer also to the response to NRC RAI TE4.3.1-3 for additional information indicating that any groundwater impacts associated with construction dewatering activities are not anticipated to significantly impact the wetlands.

The majority of the wetland impacts at the Fermi site would be short term and minor and the wetland functions would not experience long-term effects. The restoration of wetland vegetation in temporarily affected areas would return wetland functions, such as the filtration and retention of sediments in stormwater and nutrient reduction through absorption and flood attenuation, to preconstruction conditions.

4.5.3 Impacts to Wetland Functions in the Region

Refer to ER Subsections 2.4.1.1.1, Vegetation on Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10, and 2.4.1.2.3, Habitats, for information regarding the functions and values assessment of coastal wetlands at the Fermi site. In addition, refer to the response to NRC RAI TE2.4.1-6 that provides the "DTE Fermi II Site, Monroe County Wetland Investigation Report," which contains a functions and values assessment of the wetlands on the Fermi site. The coastal wetlands at the Fermi site are important primarily because of the loss of other regional coastal wetlands to development or disturbance, reducing the overall coastal wetland acreage.

The proposed permanent wetland impacts for Fermi 3 construction represent a small reduction in coastal wetland acreage in Monroe County, Michigan (2.75 ac. on the Fermi site versus more than 24,500 ac. in Monroe County; approximately a 0.01 percent reduction). Early estimates of wetland impacts, under the original site plan would have resulted in the loss from the Fermi project of up to 0.7 percent of the remaining coastal wetlands in Monroe County. However, Detroit Edison revised the site arrangement specifically to reduce wetland impacts. Under the Fermi 3 site plan, extensive coastal wetlands acreage in Monroe County, Michigan would still be present, and existing regional wetland functions would not be noticeably reduced. Refer to the response to [NRC RAI TE4.3.1-6](#) for additional information regarding existing inland and coastal wetlands data.

4.5.3.1 Preconstruction Impacts

Refer to Figure 1.2-22, Potential Wetlands Construction Impacts, for an overview of areas to be affected by construction. Refer to [ER Chapter 4, Environmental Impacts of Construction](#), for a description of preconstruction activities.

The majority of the preconstruction impacts at the Fermi site would be short term and minor, and wetland functions would not experience long-term effects. Most effects would be restricted to the immediate site. Consequently, the preconstruction effect on regional wetlands would be limited.

Refer to [ER Subsection 6.5.1.2, Site Preparation, Construction and Pre-Operational Monitoring](#), for information on measures to reduce pre-construction impacts related to the transmission lines.

4.5.3.2 Construction Impacts

Refer to Figure 1.2-22, Potential Wetlands Construction Impacts, for an overview of areas to be affected by construction. Refer to [ER Chapter 4, Environmental Impacts of Construction](#), for a description of construction activities. Measures to reduce the effects of temporary impacts (e.g., SESC Plan to reduce the influx of sediments to wetlands or open water) would decrease the time necessary for recovery from temporary disturbances. Refer to the response to [NRC RAI HY4.6-1](#) for additional information regarding the Fermi 3 SESC plan.

Because most temporary impacts would be controlled within the Fermi site, the principal effects of construction on the regional wetlands would be limited to loss of total acreage (size function). The overall reduction in coastal wetland acreage would be small (refer to Subsection 4.5.3) and is not expected to cause additional coastal development in the wetlands nor have an adverse effect on coastal wetland functions within Monroe County.

4.5.4 Impacts on Wetland Values

Refer to [ER Subsection 2.4.1.2.3, Habitats](#), and to the wetland functions and values assessment in the "DTE Fermi II Site, Monroe County Wetland Investigation Report," which is included within the response to [NRC RAI TE2.4.1-6](#), for information regarding the Fermi wetland values assessment.

4.5.4.1 Impacts on Wetland Values on the Fermi Site

The primary values provided by the Fermi wetland complex are the functions described in Subsection 4.5.3 and use of the undeveloped portions of the site for scientific research. How well these functions are provided by the wetland complex differs with location, which defines the value of these functions; higher value generally is placed on wetlands providing high function. This subsection discusses impacts on the value of the Fermi wetland complex for scientific research from Fermi 3 construction.

4.5.4.1.1 Preconstruction Impacts

Refer to ER Chapter 4, Environmental Impacts of Construction, for a description of preconstruction activities. These activities would occur in locations that are identified as temporary or permanent impacts on wetlands in the Conceptual Mitigation Plan that is provided in response to NRC RAI TE4.3.1-4. The majority of the preconstruction impacts at the Fermi site would be short term and minor, and wetland values would not experience long-term effects.

Refer to ER Subsection 6.5.1.2, Site Preparation, Construction and Pre-Operational Monitoring, for information on measures to reduce pre-construction impacts related to the transmission lines.

4.5.4.1.2 Construction Impacts

Refer to ER Chapter 4, Environmental Impacts of Construction, for a description of construction activities. Refer also to the response to NRC RAI TE4.3.1-3 for additional information indicating that any groundwater impacts associated with construction dewatering activities are not anticipated to significantly impact the wetlands.

The Lagoona Beach unit of the DRIWR is located within the proposed work area for the Fermi plant (refer to Figure 1.2-10). This refuge unit currently provides an opportunity for scientific research related to wildlife habitat use in a suburban/industrial setting that contains coastal wetlands. The Educational/Scientific value of the site would be affected by Fermi construction through construction disturbances that affect wildlife and plant communities. However, the overall impact is considered relatively small because a substantial portion of the refuge unit would remain available for research purposes during and after construction. In addition, the disturbance and subsequent restoration of wetlands represents an added research opportunity related to ecological restoration methods for coastal wetlands. The net impact on the educational/scientific value would be small.

4.5.4.2 Impacts on Regional Wetland Values

Refer to ER Subsections 2.4.1.1.1, Vegetation on Site and Vicinity, as revised by NRC RAI TE2.4.1-2, NRC RAI TE2.4.1-9, and NRC RAI TE2.4.1-10, and 2.4.1.2.3, Habitats, and to the "DTE Fermi II Site, Monroe County Wetland Investigation Report" that was completed by Ducks Unlimited and included within the response to NRC RAI TE2.4.1-6 for information regarding the values assessment of the Fermi site wetlands. This subsection considers impacts on regional wetland values arising from the Fermi 3 project.

4.5.4.2.1 Preconstruction Impacts

Refer to ER Chapter 4, Environmental Impacts of Construction, for a description of preconstruction activities. The Fermi site, while less floristically diverse than some Lake Erie wetlands, represents a valued feature for the region because other local coastal wetlands have been lost or impaired by past development. Although wetland quality on the Fermi site has been impaired by past regional development, the relative rarity of this wetland type across the local landscape makes it valuable, primarily for ecological research purposes. Other assessed values, such as recreation and visual appeal or aesthetics, are not provided by the wetlands on the Fermi site because public access is limited.

4.5.4.2.2 Construction Impacts

Refer to Figure 1.2-22, Potential Wetlands Construction Impacts,, for an overview of areas to be affected by construction. Refer to ER Chapter 4, Environmental Impacts of Construction, for a description of construction activities. The majority of the impacts at the Fermi site would be short term and minor, and wetland values would not experience long-term effects. The final mitigation plan

will include measures restoring temporary impacts and compensation for permanent impacts, thereby resulting in no net loss in regional wetland values.

4.5.5 Mitigation and Monitoring

Refer to the Conceptual Mitigation Plan provided in the response to NRC RAI TE4.3.1-4 and Section 2.4 of the USACE Report for information regarding mitigation and monitoring associated with impacts to waters of the United States. As stated in ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, wetland impacts would be mitigated through the wetland mitigation monitoring plan, developed in consultation with the USACE and MDEQ during the wetlands permitting process. Successful implementation of the Conceptual Mitigation Plan would result in no net loss of functions and values.

4.6 Fish and Wildlife

The following subsections assess the expected impact on fish and wildlife during construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on the fish and wildlife on and in the vicinity of the Fermi site.

4.6.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on fish and wildlife at the Fermi site and the surrounding vicinity. The following subsections provide or reference the ER Chapter 4, Environmental Impacts of Construction, and Chapter 5, Environmental Impacts of Operation, assessment of expected Fermi 3 construction and operational impacts concerning the following areas:

- Impacts on Aquatic Ecosystems.
- Special Aquatic Sites.
- Impacts on Impoundments and Streams.
- Impacts on Lake Erie.
- Impacts on Threatened and Endangered Species.
- Impacts on Commercial and Recreational Aquatic Species.
- Impacts on Other Important Species.

4.6.1.1 Construction Impacts

As stated in ER Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1, the Fermi 3 site plan and construction plan was designed to minimize site-specific and cumulative impacts on the terrestrial ecosystem to the greatest feasible extent while meeting the project purpose.

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a summary of the expected environmental impacts associated with Fermi 3 construction and the associated measures or controls limiting these impacts, including those associated with aquatic and terrestrial ecosystems.

Refer to ER Subsection 5.1.2, Transportation Corridors and Offsite Areas, for information on anticipated impacts from transmission construction and the expected overall effects of transmission construction impacts.

4.6.1.1.1 Impacts on Aquatic Ecosystems

Refer to ER Subsection 4.3.2, Aquatic Ecosystems, as revised by NRC RAI GE3.1-1, for an assessment of potential temporary and permanent impacts on aquatic ecosystems caused by Fermi 3 construction activities. ER Subsection 4.3.2 specifically identifies those impacts on impoundments and streams, Lake Erie, threatened and endangered species, commercial and recreational aquatic species, and other important species.

Refer to ER Subsections 4.3.1.5.4, Important Habitats; 4.3.2.3, Impact to the Transportation Corridors and Offsite Areas; and 5.6.2, Aquatic Ecosystems, for an assessment of impacts to wetlands and aquatic habitats related to transmission line construction.

4.6.1.1.1.1 Special Aquatic Sites

Sanctuaries and Refuges

Refer to Subsection 4.2.2.1 of the USACE Report and the referenced section of the ER for an assessment of impacts on the DRIWR resulting from Fermi 3 construction activities.

Wetlands

Refer to Section 4.5 of the USACE Report and the referenced sections of the ER for an assessment of wetland impacts resulting from Fermi 3 construction activities.

4.6.1.1.1.2 Impacts on Impoundments and Streams

As stated in ER Subsection 4.3.2.1, Impacts to Impoundments and Streams, the greatest potential for adverse impacts on fisheries resources during construction comes from increased sedimentation and turbidity from construction-related erosion and temporary discharges that could affect aquatic habitats. Refer to ER Subsection 4.3.2.1 for an assessment of expected impacts on the following:

- Benthic habitats and biota caused by siltation.
- Vegetation associated with the onsite drainage systems, canals, and wetlands.
- Wetland and Lake Erie coastal habitats.

ER Subsection 4.3.2.1 provides information regarding the potential short-term and temporary loss of benthic habitats and biota (communities) associated with onsite drainage systems and canals from siltation caused by increased sedimentation during Fermi 3 construction.

ER Subsection 4.3.2.1 also provides information regarding vegetation associated with the onsite drainage systems, canals, and wetlands. As indicated in ER Subsection 4.3.2.1, the construction impact on aquatic plants in onsite drainage systems and canals would be similar to impacts on this system from naturally occurring events, such as periods of heavy inundation and flooding; therefore, any expected impacts from construction activities are expected to be minor and short term.

In addition, ER Subsection 4.3.2.1 discusses the routine habitat changes experienced by wetland and coastal habitats, such as those within the DRIWR, associated with heavy rains and flooding events. These naturally occurring episodic events are representative of impacts expected because of

surrounding construction activities (e.g., erosion, increased sedimentation and increased turbidity). The aquatic biota found in these types of habitats are highly adapted to survive in dynamic aquatic regimes and, therefore, can be expected to recover from these effects quickly without significant decreases in overall health and sustainability. As a result, the proposed work is not expected to significantly alter the character of runoff on the site. Further, runoff occurring during construction is not expected to eliminate or substantially alter the existing algae, plants, invertebrates, or fish that inhabit the near-shore area in favor of species more tolerant of conditions resulting from construction activities.

As indicated in ER Subsection 4.3.2.1, BMPs established by an SESC Plan will minimize and control the entry of materials into the onsite drainage systems and canals. These BMPs will assist in limiting turbidity from sediment-laden runoff from the construction site. In summary, the majority of impacts on impoundments and streams resulting from Fermi 3 construction activities are expected to be minor and short term. Refer to the response to NRC RAI HY4.6-1 for additional information regarding the expected SESC Plan contents.

Permanent construction-related losses to aquatic biota are expected to be limited to portions of the DRIWR associated with construction activities such as the filling in of certain onsite water bodies. Refer to ER Subsection 4.3.1.2.2, Important Habitats, as revised by NRC RAI GE3.1-1, for a discussion of Fermi 3 construction impacts associated with construction activities within the DRIWR.

4.6.1.1.1.3 Impacts on Lake Erie

Refer to ER Subsection 4.3.2.2, Impacts to Lake Erie, as revised by NRC RAI HY4.2.1-8, for information concerning the projected impacts on Lake Erie associated with Fermi 3 construction. As indicated in ER Subsection 4.3.2.2, Fermi 3 construction activities occurring within Lake Erie include the following:

- Construction of the Fermi 3 intake structure.
- Construction of the Fermi 3 discharge line.
- Temporary dredging and maintenance dredging of the existing water intake bay associated with the barge facility and intake embayment.

Construction of the Fermi 3 intake structure, discharge line, and barge facility will require dredging of the existing water intake bay. Dredging within the intake embayment is projected to be similar to ongoing Fermi 2 operations and maintenance (O&M) dredging activities within the intake embayment authorized under an existing USACE permit. Therefore, as indicated in ER Subsection 10.4.2.2.3, Terrestrial and Aquatic Biology, construction of the intake structure is expected to result in minor impacts on aquatic biology.

4.6.1.1.1.4 Impacts on Threatened and Endangered Species

Information regarding the expected impacts of construction on threatened and endangered species located on or near the Fermi site is discussed in Subsection 4.2.2.1 of the USACE Report.

Information on anticipated impacts to threatened or endangered species related to transmission construction is provided in ER Subsections 4.3.1.5.3, Important Species; 4.3.2.3.2, Important Aquatic Species; and 5.6.1.3, Important Terrestrial Species and Habitats.

4.6.1.1.1.5 Impacts on Commercial and Recreational Aquatic Species

Refer to ER Subsection 4.3.2.4.2, Commercial and Recreational Aquatic Species, for an assessment of the potential impacts on commercial and recreational aquatic species from construction activities. This assessment includes information regarding potential impacts on fish migratory pathways resulting from increased turbidity and contamination in construction effluents. The assessment concludes that, with the implementation of appropriate spill prevention and construction runoff measures, Fermi 3 construction activities will result in only minor, short-term impacts on commercial and recreational aquatic species and fish migratory behaviors.

4.6.1.1.1.6 Impacts on Other Important Species

Refer to ER Subsection 4.3.2.4.3, Other Important Species, for an assessment of potential impacts on water quality indicator organisms, such as mayflies and essential fish habitat. In summary, as indicated in ER Subsection 4.3.2.4.3, the expected environmental impacts on other important species resulting from Fermi 3 construction are minor and short term.

4.6.1.1.2 Impacts on Terrestrial Ecosystems

Refer to ER Subsection 4.3.1, Terrestrial Ecosystems, as revised by NRC RAI GE3.1-1, for a description of expected impacts on existing terrestrial ecosystems from Fermi 3 construction, including offsite transmission line construction.

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a summary of the expected environmental impacts associated with Fermi 3 construction and the associated measures or controls limiting expected construction impacts, including offsite transmission line construction.

Refer to the response to NRC RAI HY4.6-1 for additional information associated with the Fermi 3 SESC Plan.

Refer to ER Subsection 5.6.1, Terrestrial Ecosystems, for more information on anticipated impacts from transmission construction.

4.6.1.1.2.1 Impacts on Terrestrial Vegetation

The expected impacts on terrestrial ecosystems from activities associated with Fermi 3 construction are described in ER Subsection 4.3.1, Terrestrial Ecosystems, as revised by NRC RAI GE3.1-1. ER Subsection 4.3.1 provides the total disturbed acreage, from temporary and permanent impacts, of terrestrial habitats associated with Fermi 3 construction. As stated in ER Subsection 4.3.1, the Fermi 3 original site plan was designed to minimize terrestrial ecosystem impacts to the greatest extent possible. The site design uses currently developed and previously disturbed grounds wherever possible. Temporarily disturbed sites are expected to be replanted following construction.

Refer to ER Subsection 4.3.1.1.1, Vegetation on the Site and in the Vicinity, as revised by NRC RAI GE3.1-1, for information concerning the expected impacts of construction activities on vegetation and habitat. The overall impacts of Fermi 3 construction activities on terrestrial plant communities are considered minor, and short term; therefore, no further mitigation measures are warranted. Subsections within the revised ER Subsection 4.3.1.1.1 provide evaluations of the expected impacts on terrestrial vegetation associated with the various terrestrial plant communities.

Notwithstanding the above conclusions, as stated in ER Subsections 4.3.1.1.1, Vegetation on the Site and in the Vicinity and 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, Detroit Edison intends to revegetate temporarily affected areas using native plant species following project

construction. In certain instances, the project may revegetate in locations vulnerable to erosion. The restored habitat is expected to provide improved species composition in the plant communities and enhanced wildlife habitat by providing both improved forage and shelter for wildlife in the area.

Refer to ER Subsection 4.3.1.5.1, Vegetation, and 5.6.1.1, Vegetation, for information regarding impacts on vegetation from transmission construction.

4.6.1.1.2.2 Impacts on Terrestrial Wildlife on the Site and in the Vicinity

As stated in ER Subsection 4.3.1.1.2, Wildlife on the Site and in the Vicinity, a variety of organisms would be temporarily displaced by the proposed construction and resulting end use. Mammals and birds are expected to leave the area when there is a disturbance. As stated in ER Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, clearing of wooded areas has been planned so that wildlife corridors and roosting or nesting areas for the two state protected species would be avoided. Temporarily displaced wildlife can return to useable habitat after construction. Habitat available to displaced wildlife is sufficient to temporarily support the additional individuals, and habitat degradation from overuse is not anticipated.

Refer to ER Subsection 4.3.1.2, Important Terrestrial Species and Habitats, for an assessment of the expected impacts of Fermi 3 construction on important species and habitat as defined by NUREG-1555. As indicated in ER Subsection 4.3.1.2, Fermi 3 construction activities are expected to cause short term impacts on three important species (bald eagle, eastern fox snake, and American lotus). Although the two wildlife species may be temporarily affected during construction, the overall available habitat would not be substantially reduced and individuals of these species are expected to persist on the Fermi site. American lotus is an abundant species on the Fermi site, and wetlands presently containing the species would remain largely intact after construction. Refer also to the response to NRC RAI TE2.4.1-2 for reports documenting the terrestrial surveys of the Fermi site and an impact assessment. Overall, impacts on important species are expected to be minor and short term.

Refer to ER Subsections 4.3.1.5.2, Wildlife and 5.6.1.2, Wildlife, for information on impacts to wildlife from transmission line construction.

4.6.1.2 Operational Impacts

Refer to ER Chapter 5, Environmental Impacts of Operation, for an assessment of the expected impacts associated with Fermi 3 operation. Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for a summary of the expected environmental impacts associated with Fermi 3 operation and the associated measures or controls limiting the expected operational impacts, including those associated with aquatic and terrestrial ecosystems. As indicated in ER Table 5.10-1, expected impacts on aquatic ecosystems would be minor and may include impingement, entrapment, or entrainment by the intake system, and thermal, chemical, and physical impacts as a result of water discharges. Expected impacts on terrestrial systems would be minor and may include impacts on wildlife resulting from operating noise, discharge of small quantities of waste salts and chemicals into the air, and avian collisions with towers.

Impacts related to transmission line operation are discussed in ER Subsections 5.1.2, Transportation Corridors and Offsite Areas; 5.1.2.4, Spills; 5.1.2.5, Maintenance Activities; and ER Section 5.6, Transmission System Impacts, including the related subsections.

4.6.1.2.1 Impacts on Aquatic Ecosystems

The following subsections provide an assessment of the expected impacts on aquatic ecosystems resulting from Fermi 3 operation.

4.6.1.2.1.1 Special Aquatic Sites

This subsection identifies the expected impacts on special aquatic sites resulting from Fermi 3 operation.

Sanctuaries and Refuges

Refer to Subsection 4.2.2.2 of the USACE Report for a discussion of impacts on the DRIWR.

Wetlands

Refer to Section 4.5 of the USACE Report for a discussion of impacts on onsite wetlands.

Refer to ER Subsection 5.6.1.4, Wetlands and Floodplains, for a discussion of impacts to wetlands in the transmission corridors.

4.6.1.2.1.2 Impacts on Aquatic Ecosystems Resulting from Operation of the Intake Structure and Cooling System

Refer to ER Subsection 5.3.1.2, Aquatic Ecosystems, for an assessment of the expected impacts on aquatic ecosystems from Fermi 3 intake structure and cooling system operation. As stated in ER Subsection 5.3.1.2.1, Potential Impacts, the potential impacts on aquatic ecosystems associated the operation of the Fermi 3 intake structure and cooling water systems are entrapment, impingement, and entrainment. Refer to ER Subsection 5.3.1.2.2, Measures and Controls that Limit Adverse Impacts, for a discussion of strategies that may limit adverse impacts caused by operation of the Fermi 3 intake structure and cooling system.

Refer to ER Subsection 5.3.1.2.3, Principal Aquatic Resources, for a description of the expected impacts on aquatic resources, such as plankton, benthic invertebrates, commercial and recreational fisheries, threatened and endangered species, and overall fish production, from operation of the Fermi 3 cooling system.

Refer to the response to NRC RAI AE2.4.2-2 for the Aquatic Ecology Survey. The Aquatic Ecology Survey provides Fermi site-specific aquatic ecology information and evaluates impingement mortality associated with the intake structure. Refer also to the response to NRC RAI AE5.2.2-1 for a description of the design and operation of the fish screening system at the Fermi 2 intake and for the proposed Fermi 3 intake.

In summary, as indicated in ER Subsection 5.3.1.3, Conclusions, the overall impacts on aquatic resources resulting from the Fermi 3 intake are considered minor and should not significantly affect aquatic communities. Therefore, no mitigative measures are required.

4.6.1.2.1.3 Impacts on Aquatic Ecosystems Resulting from Operational Discharge of Cooling Water

Refer to ER Subsection 5.3.2, Discharge System, for a description of the physical impacts of Fermi 3 discharge to surrounding waters and the potential impacts of the cooling water discharge on the water quality and aquatic ecosystem in the Western Basin of Lake Erie. Specifically, ER Subsection 5.3.2.2, Aquatic Ecosystems, identifies the expected impacts on aquatic ecosystems from the

discharge of cooling water into the Western Basin of Lake Erie during Fermi 3 operation. Impacts associated with the operational discharge of cooling water on aquatic ecosystems include the following:

- Changes in the benthic ecosystems in the immediate area of the discharge and cold shock to aquatic organisms.
- Impacts resulting from chemicals within the effluent.
- Impacts resulting from physical effects of the Fermi 3 discharge.

The expected thermal impact from the discharge of Fermi 3 operational cooling water is expected to be minor. This is because the Fermi 3 discharge and associated thermal plume in Lake Erie are expected to be small due to the small discharge (24.4 million gallons per day [mgd]) and the use of a high rate diffuser that will allow rapid mixing of the plume with ambient lake water. This occurrence is demonstrated in ER Subsection 5.3.2.1, Thermal Description and Physical Impacts. In summary, as indicated in ER Subsection 5.3.2.2.1, Thermal Impacts, the expected thermal plume resulting from the discharge of cooling water from Fermi 3 into Lake Erie would be small, and little displacement of localized cool and coldwater fish congregations is expected. Therefore, no significant thermal impacts on local fish species are projected to occur.

The discharge of chemicals within the Fermi 3 operational cooling water is not expected to have an adverse impact on aquatic resources within the Western Basin of Lake Erie. Refer to ER Subsection 5.3.2.2.2, Chemical Impacts, for a discussion of the expected impacts on aquatic ecosystems at Fermi associated with the chemical components of the Fermi 3 effluent. As stated in ER Subsection 5.3.2.2.2, the chemicals contained within the Fermi 3 effluent would be limited to those constituents listed in the NPDES permit, as detailed in ER Section 2.3, Water. It is projected that adherence to NPDES effluent limits and monitoring requirements will ensure that any chemical components contained in the Fermi 3 effluent would not adversely affect aquatic resources within the Western Basin of Lake Erie. Similarly, operational discharges would be in compliance with the Clean Water Act Section 307 toxic effluent standards or bans.

The physical impacts (e.g., shoreline erosion, bottom scouring, and subsequent turbidity and siltation) associated with Fermi 3 operational discharges of cooling water are expected to be minor. As indicated in ER Subsection 5.3.2.2.3, Physical Impacts, Fermi 3 operation would result in the minor loss of substrate in the small area associated with the discharge outfall. Consequently, aquatic organisms residing in the direct vicinity of the discharge structure are projected to be minimally affected.

Overall, the physical impacts associated with thermal discharge from Fermi 3 on aquatic resources and important aquatic species are not projected to be significant.

4.6.1.2.1.4 Impacts on Aquatic Ecosystems Resulting from Chemical Discharges

Refer to ER Subsection 5.3.2.2.2, Chemical Impacts, for an assessment of the expected impacts on aquatic ecosystems associated with the chemical components of the Fermi 3 effluent. Because Fermi 3 will comply with future NPDES permits, no significant chemical-induced impacts on aquatic resources within the Western Basin of Lake Erie are expected.

Refer to ER Subsection 5.1.2.4, Spills, for information regarding chemical spills and response in the transmission corridors.

4.6.1.2.1.5 Impacts on Aquatic Ecosystems Resulting from Physical Impacts

Refer to ER Subsection 5.3.2.2.3, Physical Impacts, for an assessment of the expected physical impacts (e.g., erosion, bottom scouring, siltation, and turbidity) associated with Fermi 3 operation on aquatic resources.

4.6.1.2.2 Impacts on Terrestrial Ecosystems

Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for an assessment of expected impacts on terrestrial ecosystems during operations and the specific measures and controls limiting those identified impacts, including offsite transmission line operation.

4.6.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on fish and wildlife and the associated habitats.

4.6.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1, for a discussion of the expected cumulative impacts on terrestrial and aquatic ecosystems associated with Fermi 3 construction.

4.6.2.1.1 Cumulative Impacts of Construction on Terrestrial Ecosystems

Refer to ER Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, for a discussion of the expected cumulative impacts on terrestrial resources resulting from Fermi 3 construction. Refer to ER Subsection 4.7.4, Ecology, for a discussion of expected cumulative impacts related to transmission line construction. As indicated in ER Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1, the cumulative impacts on terrestrial resources other than wetlands are expected to be minor and short term. Refer to Section 4.5, Wetlands, of the USACE Report for an assessment of the expected impacts on wetlands from Fermi 3 construction. As indicated in revised ER Subsection 4.7.4, Ecology, the minor and short-term nature of the impacts is because of the following:

- A lack of other offsite actions in Monroe County involving effects on wildlife and wildlife habitat similar to those from Fermi 3 construction.
- The temporary or limited nature of most construction impacts.
- The implementation of measures limiting the intensity of any impacts.

4.6.2.1.2 Cumulative Impacts on Aquatic Ecosystems

Refer to ER Subsection 4.7.4.2, Aquatic Ecology, for a discussion of the expected cumulative impacts on aquatic resources resulting from Fermi 3 construction. As indicated in ER Subsection 4.7.4.2, there are no known projects of a similar scale to Fermi 3 that would be started or planned within the construction time frame of Fermi 3 in the area immediately surrounding the Fermi site.

As stated in ER Subsection 4.7.4.2, construction and operation of Fermi 2 did not appreciably change Lake Erie aquatic habitats near the Fermi site, and a similar result is anticipated for Fermi 3 construction.

4.6.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.4, Ecology, for a discussion of expected cumulative impacts on terrestrial and aquatic ecosystems associated with Fermi 3 operation.

4.6.2.2.1 Cumulative Impacts of Operation Terrestrial Ecosystems

Refer to ER Subsection 5.11.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, for a discussion concerning the expected cumulative impacts on terrestrial resources from Fermi 3 operation.

Refer to ER Subsection 5.11.1, Land Use as revised by NRC RAI GE3.1-1, the revised Subsection 5.11.4.1, and Subsection 5.11.4.2, Aquatic Ecology, for information regarding cumulative impacts from transmission line operation.

Specifically, Fermi 3 operation is not expected to block wildlife movement through existing travel corridors (refer to ER Subsection 2.4.1.1.2, Wildlife on the Site and Vicinity and Subsection 5.11.4.1) or otherwise result in significant losses of wildlife. Operational impacts on terrestrial resources are expected to be minor because zoning restrictions, various license and permit conditions, and other regulatory requirements control land use and facility operations, thereby limiting environmental impacts.

4.6.2.2.2 Cumulative Impacts of Operation on Aquatic Ecosystems

Refer to ER Subsection 5.11.4.2, Aquatic Ecology, for a discussion of the expected cumulative impacts on aquatic resources resulting from Fermi 3 operation, including the offsite transmission lines. ER Subsection 5.11.4.2 assesses the cumulative impacts associated with the following:

- Impingement and entrainment of aquatic organisms.
- Cooling tower operation.
- Intake structure operation.
- Water discharge.
- Discharge structure operation.

In summary, as indicated in ER Subsection 5.11.4.2, the contribution of Fermi 3 operation to cumulative impacts on aquatic resources would be minor, long term, and permanent.

4.6.3 Mitigation and Monitoring

Refer to ER Subsections 6.5.1, Terrestrial Ecology and Land Use and 6.5.2, Aquatic Ecology, for detailed information concerning ecological monitoring to occur on the Fermi site during the following periods:

- Pre-application.
- Site preparation, construction, and pre-operation.
- Operation.

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 and offsite transmission construction and the mitigation measures that may reduce those impacts.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 and offsite transmission operation and the mitigation measures that may reduce those impacts.

As indicated in ER Section 6.5, Ecological Monitoring and various subsections, Detroit Edison anticipates consulting with the USACE during the planning of site activities, specifically those activities affecting wetlands or waters of the United States. It is anticipated that any permit from the USACE will reflect the results of those consultations.

4.7 Navigation

The following subsections assess the proposed project's impact on navigation during the construction and operation of Fermi 3, the potential need for mitigation or monitoring to protect this public interest factor, and cumulative impacts. For the purpose of this review, the geographical area considered for cumulative impacts from construction is the Western Basin of Lake Erie.

4.7.1 Direct and Secondary Impacts

The following subsections assess potential impacts on federal navigation from Fermi 3 construction and operational activities.

4.7.1.1 Navigation and Barge Deliveries Associated with Fermi 3 Construction

As stated in ER Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, and Detroit Edison's response to NRC RAI HY4.2.1-7, barges will be utilized to deliver equipment and construction materials. ER Subsection 4.7.4.2, Aquatic Ecology, states that barges may be utilized for the removal of construction debris. Refer to NRC RAI SE4.4.2-9 and NRC RAI TR4.8.3-1 for information regarding the transportation of construction materials via barge.

The reactor vessel is the largest single component that would be delivered via barge. It is anticipated that a barge size of 260 feet by 72 feet with a maximum load of 1,500 tons would be utilized for delivery of the reactor vessel. A barge of this size would require a draft of no more than 5.5 feet. The existing Fermi 2 Permit 88-001-040-8, issued by the USACE under Section 404 and Section 10, allows dredging of the intake channel to create a lake bottom elevation of 560.0 feet (1985 International Great Lakes Datum [IGLD] low water data of 569.2 feet). An elevation of 560.0 feet 1985 IGLD results in a channel that is 9.2 feet deep. Therefore, it is anticipated that dredging (beyond that already performed) would not be required for delivery of the reactor vessel, because the channel depth is 9.2 feet and the required barge draft is 5.5 feet. Refer to NRC RAI HY4.2.1-7 for information regarding dredging.

It is expected that the aggregate materials necessary for Fermi 3 construction would also be delivered to the site via barge. The delivery of bulk materials, such as aggregate materials and equipment, is anticipated to be restricted to a maximum load of 1,000 tons, or similar load to limit the maximum draft of the barge to approximately seven feet. Thus, similar to the delivery of the reactor vessel, it is anticipated that dredging would not be required for delivery of 1,000 tons maximum loads, because the corresponding draft would be seven feet and the channel depth is 9.2 feet (1985 IGLD). A final determination of whether dredging of the barge channel is necessary will be made during development of the project Joint Permit Application that will be submitted to the USACE and the MDEQ. Refer to NRC RAI HY4.2.1-7 for information regarding dredging.

It is anticipated that, should dredging be required for barge deliveries, there would be no impacts to navigation, since the dredging would likely be limited to the immediate vicinity of the intake groins or possibly waterward of the tip of the groins, depending on the current lake bathymetry. Therefore, dredging would not interfere with the West Outer Channel, which is the nearest federal navigation channel to the Fermi site. The West Outer Channel and the East Outer Channel are federal navigation channels that connect in Lake Erie approximately 11.2 km (seven mi.) northeast of the Fermi site. The West Outer Channel provides the closest shipping approach in Lake Erie, at more than eight km (five mi.) from the Fermi site. The FSAR Figure 2.2-201, Industries and Transportation Routes Within 8 Km (5 Mi), illustrates the navigation channels in the Fermi region.

4.7.1.1.1 Barge Docking Facilities

ER Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, indicates that there will be construction of docking facilities for the barges/vessels used to bring in materials and machines for Fermi 3 and for the removal of construction debris. ER Figure 2.1-3, Fermi Property Boundary, as revised by NRC RAI GE3.1-1, illustrates the existing Fermi 2 and proposed Fermi 3 barge facility locations.

Additional review of barge shipments and the corresponding barge docking facility requirements will occur during development of the project Joint Permit Application to be submitted to the USACE and the MDEQ. However, impacts on navigation from the construction of barge docking facilities are not anticipated because the work and docking structure would not interfere with navigation associated with the West Outer Channel, which is the nearest federal navigation channel to the Fermi site. The docking structure would not serve as a dock for nonproject-related boats.

4.7.1.1.2 Navigation Entrance Channel

The USCG does not require the demarcation of a private navigation entrance channel for barge transportation from the West Outer Channel to the Fermi site. Instead, the barge, tug, or push boats would use on-board navigation systems for routing to the Fermi site. However, barge, tug, or push boat operators could request the private navigation entrance channel be marked for ease of identification. The appropriate demarcation of the private navigation entrance channel would be determined by the USCG. All activities associated with the identification, establishment, and maintenance of the temporary navigation entrance channel are expected to comply with applicable agency regulations. A determination of whether dredging is required will be clarified during development of the project Joint Permit Application that will be submitted to the USACE and the MDEQ.

The identification of the navigation entrance channel from the West Outer Channel would occur through coordination with government agencies (e.g., USCG or USACE). All activities associated with the identification, establishment, and maintenance of the temporary navigation entrance channel would be in compliance with applicable agency regulations. Additionally, the entrance channel would not serve as an entrance channel for nonproject-related boats. FSAR Subsection 2.2.2.4, Description of Waterways, indicates that the waters and adjacent shoreline of Fermi 2 are designated as a security zone, as set forth in 33 CFR 165.915. Entry into this zone is prohibited unless authorized by the USCG. ER Figure 2.1-2, Site Vicinity within 7.5-Mile Radius, illustrates the security zone that extends from the Fermi site shoreline and waterward. The same Lake Erie security zone for Fermi 2 would be maintained for Fermi 3.

Impacts on navigation associated with dredging the temporary entrance channel are not anticipated to affect the marine navigation associated with the West Outer Channel because of its proximity to the Fermi site. If dredging the entrance channel is required, it is anticipated that dredging would not extend to the West Outer Channel. Instead, dredging would likely be limited to a distance waterward

of the tip of the groins. Prior to any permitted dredging event, coordination with the USCG and USACE and compliance with the applicable requirements would be completed.

4.7.1.1.3 Construction Barge Traffic

Impacts on navigation due to barge deliveries of bulk materials and equipment to the Fermi site are anticipated to be minimal. The inbound and outbound construction barge traffic is anticipated to utilize the West Outer Channel or East Outer Channel and the temporary entrance channel to the Fermi site. For the purpose of this discussion, it is assumed that winter navigation would not be restricted and that barge deliveries would occur each month for four years of construction. It is also anticipated that each barge arriving and leaving the Fermi site would be accompanied by either a tugboat or push boat. Therefore, the estimated number of either tug or push boats is expected to be equivalent to the anticipated number of barge deliveries. It is anticipated that the reactor vessel and concrete aggregate for various structures would be delivered by barge. The reactor vessel and concrete aggregate are identified as the largest items/volume of material expected to be delivered via barge.

It is anticipated that the reactor vessel would be delivered as a single component requiring one barge delivery. The aggregate associated with operation of the concrete batch plant for concrete production of major plant structures and support facilities is estimated to be approximately 460,000 cu yd. If the aggregate deliveries are limited to 1000 T, and the aggregate delivery and concrete production occur within the first four years of construction, the estimated average barge delivery frequency would be about 18 per month or 216 annually. It is anticipated that a tug or push boat would accompany each barge arriving and leaving the Fermi site. Therefore, it is estimated that 216 tug or push boats would travel to and from the Fermi site per year over four years of construction.

Navigation data for calendar year 2007 for those ports located in the Western Basin of Lake Erie showed that the Port of Detroit realized a total of 3,199 domestic and foreign trips for all commercial vessel types (e.g., self-propelled dry cargo, self-propelled tanker, self-propelled towboat, non-self-propelled dry cargo, and non-self-propelled tanker liquid barge) and all traffic directions (e.g., receipts, shipments, intra-waterway, inbound, and outbound) (Reference 4.7-1). The Port of Monroe realized a total of 137 domestic and foreign trips for all commercial vessel types and all commercial traffic directions (Reference 4.7-2). Likewise, the Port of Toledo realized 1,637 trips, while the Port Clinton realized 4,346 trips for all commercial vessel types and all commercial traffic directions (References 4.7-3 and 4.7-4).

Therefore, based upon the number of annual barge deliveries associated with Fermi 3 construction, construction barge traffic associated with Fermi 3 is not anticipated to impact barge traffic at these ports. It is anticipated the Fermi 3 construction barges would load cargo from a point of origin with the bulk material and equipment transload points. It is also anticipated that cargo transported via barge would unload at the Fermi site, instead of transloading at one of these ports. As construction details are developed, the frequency of barge deliveries, barge origination, navigation route, and barge operating requirements will become known.

It is possible that there could be other construction components delivered by barge, but these are undetermined at this time and will be resolved as project planning proceeds.

4.7.1.1.4 Intake/Discharge Line Construction

No impacts on navigation are anticipated from construction of the new Fermi 3 intake structure and discharge line. ER Figure 4.2-1, Construction Affected Areas, as revised by NRC RAI GE3.1-1, illustrates the location for the Fermi 3 intake structure and discharge line.

Prior to installation of the new intake structure and discharge line, it is anticipated that a temporary cellular cofferdam would need to be constructed so that work on the new intake structure pump house

can be accomplished "in the dry." The cellular cofferdam is estimated to be 200 feet long (extending from either side of each groin), nine feet wide, and 14 feet high. The top of the cellular cofferdam is estimated to be at Elevation 576.0 feet plant datum. In addition to the cellular cofferdam, it is estimated that approximately 12,000 sq. ft. of sheet piling would be erected and extend an additional three feet above the top elevation of the cellular cofferdam for a total height elevation of 579.0 feet plant datum. The sheet piling protects the work area against the wave action of Lake Erie. The removal of the temporary cellular cofferdam is estimated to require 933 cu yd. of granular fill material.

The installation of the Fermi 3 intake structure is estimated to require approximately 20,513 cu yd. of excavation within the existing intake channel. It is also estimated that the backfill required for final installation of the intake structure would be approximately 16,089 cu yd. Likewise, it is estimated that 8,522 cu yd. of material would require excavation for placement of the 1,300-foot discharge line. It is also estimated that 3,030 cu yd. of heavy riprap and 5,490 cu yd. of stone would be necessary for the full installation of the discharge line. Refer to the response to NRC RAI HY2.3.1-9 for information regarding the discharge line.

Although this construction task requires dredge and fill activities, these activities are not anticipated to interfere with or affect the federal navigation associated with the West Outer Channel, because the discharge line installation activities would be localized in the immediate area of the Fermi 3 intake channel.

4.7.1.2 Operational Impacts

4.7.1.2.1 Barge Docking Facilities

Impacts on navigation from barge facilities and a potential private navigation entrance channel to the Fermi site are not anticipated during Fermi 3 operation. Barge traffic to or from the Fermi site during Fermi 3 operations would be infrequent. Minimal project-related boat traffic, comparable to existing Fermi 2 boat traffic levels, would be expected at the Fermi site during Fermi 3 operations.

4.7.1.2.2 Discharge and Intake Structures

Operation of the discharge line and intake structure is not anticipated to interfere with navigation. Refer to ER Subsection 2.3.1.1.3.3, Plant Intake/Discharge Interface with Lake Erie, for information regarding the Fermi 3 intake/discharge line and discharge ports. ER Figure 5.3-1, Station Layout with Intake, Discharge and Outfalls, illustrates the location of the intake and discharge structures relative to Lake Erie. ER Subsection 3.1.2, New Facility Arrangement, as revised by NRC RAI GE3.1-1, states that the intake for Fermi 3 will be adjacent to the intake for Fermi 2 (i.e., located between the two groins that protrude into Lake Erie).

ER Subsection 5.2.2.7, Discharge Design, states that the discharge outfall will extend approximately 1,300 feet offshore of the plant location. The groins extend 600 feet offshore of the plant location; therefore, the discharge line and discharge ports would extend approximately 700 feet waterward of the tip of the groins. The discharge line would protrude into Lake Erie, but it would not interfere with navigation associated with the West Outer Channel because the discharge line would be approximately five miles away from the West Outer Channel. The discharge line would be equipped with three discharge ports located above the lake bottom. The discharge ports would not interfere with navigation because they would be located only slightly above the lake and would be demarcated according to USCG requirements.

FSAR Subsection 2.2.3.1.6, Collisions with Intake Structures, discusses the potential for interaction with navigation during operation of the Fermi 3 intake structure. ER Figure 5.3-1, Station Layout with Intake, Discharge and Outfalls, shows the location of these structures relative to Lake Erie. The West Outer Channel, which allows navigation by large ships and barges, is approximately eight km (five mi.) from Fermi 3. Therefore, impacts on federal navigation from the operation of the intake structure are not anticipated.

Periodic maintenance dredging is anticipated for the continued operation of the Fermi 3 intake structure. ER Subsection 5.1.1, The Site and Vicinity, states that maintenance dredging for the Fermi 3 intake embayment would occur approximately once every three to four years. The periodic maintenance dredging would be localized in the immediate area of the Fermi 3 intake embayment between the rock groins. Similar to Fermi 2 maintenance dredging operations, which do not interfere with navigation, it is anticipated that periodic dredging would not interfere with federal navigation along the West Outer Channel.

4.7.2 Cumulative Impacts

This subsection discusses the cumulative impacts on navigation that could result from construction barge traffic associated with Fermi 3.

4.7.2.1 Cumulative Impacts of Construction

Potential cumulative impacts associated with the Ports of Monroe, Detroit, Clinton, and Toledo and Fermi 3 construction barge traffic are not expected because it is anticipated that Fermi 3 construction barges would load cargo from a point of origin associated with the aggregate and reactor vessel vendor and would unload at the Fermi site instead of transloading at one of these ports.

Federal navigation construction projects are overwhelmingly those associated with dredging federally maintained navigation channels completed under the Detroit District of the USACE Operations & Maintenance (O&M) Program. To determine whether cumulative impacts of ongoing federal navigation construction projects are likely to occur, the baseline navigation information and proposed, ongoing, and future federal navigation construction projects in the Western Basin of Lake Erie are considered herein, along with the potential navigation impacts of construction barge traffic associated with Fermi 3.

Apart from ongoing O&M, there are no known major federal navigation construction projects planned for the Western Basin of Lake Erie during the Fermi 3 construction period. There are no known major construction projects associated with federal and non-federal project sponsors planned for the Western Basin of Lake Erie. Because existing navigation traffic in the Western Basin of Lake Erie is familiar with the continual presence of O&M navigation construction projects and because Fermi 3 construction barge delivery activities will comply with all applicable regulatory requirements, cumulative impacts associated with major federal navigation construction projects and federal projects with non-federal project sponsors are not anticipated.

4.7.2.2 Cumulative Impacts of Operations

Cumulative impacts are not anticipated because barge traffic to or from the Fermi site during Fermi 3 operations would be infrequent. During Fermi 3 operations minimal project-related boat traffic would be expected at the Fermi site. Nonproject-related boats/vessels would not be allowed to navigate to the Fermi site because of the security zone. FSAR Subsection 2.2.2.4, Description of Waterways, indicates that the waters and adjacent shoreline of Fermi 2 are designated as a security zone, as set forth in 33 CFR 165.915. Entry into this zone is prohibited unless authorized by the USCG. The Lake Erie security zone for Fermi 2 would be maintained for Fermi 3. ER Figure 2.1-2, Site Vicinity within

7.5-Mile Radius, illustrates the security zone that extends from the Fermi site shoreline and waterward.

4.7.2.3 Mitigation and Monitoring

The potential establishment and operation of a navigation entrance channel from the West Outer Channel to the Fermi site and the docking facilities at the Fermi site will comply with the USCG and USACE regulatory requirements. Mitigation or monitoring associated with the construction barge docking facilities and navigation entrance channel that may be established for construction barge deliveries is anticipated to include those requirements associated with maintaining USCG Private Aids to Navigation, corresponding USCG requirements, and USACE requirements. It is anticipated that Private Aids to Navigation installed for safe barge navigation to and from the Fermi site would be maintained in good operating condition in accordance with USCG requirements.

Mitigation or monitoring associated with Fermi 3 construction barge traffic would include USCG and USACE requirements. Mitigation or monitoring could also possibly include implementation of reliable scheduling logistics and advance planning, along with routine communications between Detroit Edison and Port of Monroe officials regarding barge deliveries.

4.7.3 References

- 4.7-1 U.S. Army Corps of Engineers Navigation Data Center, Waterborne Commerce Statistics Center, Part 3 Great Lakes, Port Trips by Draft, Sheet 187, <http://www.iwr.usace.army.mil/ndc/scsc/webpub/Part3PortsTripsbyDraftnewCY2007.HTM>, accessed 27 October 2009.
- 4.7-2 U.S. Army Corps of Engineers Navigation Data Center, Waterborne Commerce Statistics Center, Part 3 Great Lakes, Port Trips by Draft, Sheet 148, <http://www.iwr.usace.army.mil/ndc/scsc/webpub/Part3PortsTripsbyDraftnewCY2007.HTM>, accessed 27 October 2009.
- 4.7-3 U.S. Army Corps of Engineers Navigation Data Center, Waterborne Commerce Statistics Center, Part 3 Great Lakes, Port Trips by Draft, Sheet 235, <http://www.iwr.usace.army.mil/ndc/scsc/webpub/Part3PortsTripsbyDraftnewCY2007.HTM>, accessed 27 October 2009.
- 4.7-4 U.S. Army Corps of Engineers Navigation Data Center, Waterborne Commerce Statistics Center, Part 3 Great Lakes, Port Trips by Draft, Sheet 166, <http://www.iwr.usace.army.mil/ndc/scsc/webpub/Part3PortsTripsbyDraftnewCY2007.HTM>, accessed 27 October 2009.

4.8 Recreation

The following subsections assess the proposed project's expected impact on recreational resources during construction and operation, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on recreational resources within the Fermi area.

4.8.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on recreational resources in Chapter 4 Environmental Impacts of Construction and Chapter 5 Environmental Impacts of Operation, respectively.

4.8.1.1 Construction Impacts

The following subsections assess the expected impacts associated with Fermi 3 construction on recreational resources. The assessment identifies the impacts pertaining to public recreation, not to recreational resources available to the applicant.

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a description of the expected temporary impact on tourism/recreation resulting from construction activities associated with Fermi 3.

4.8.1.1.1 General Recreational Activities

Construction activities are not expected to affect public recreational opportunities on the Fermi site. As stated in ER Section 2.1, Station Location, the Fermi site does not house any recreational facilities. Furthermore, as stated in ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, Detroit Edison does not allow access to the Fermi site for recreational purposes. Therefore, Fermi 3 construction would minimally affect an area of value for the public's passive recreation, such as photography, birdwatching, walking, people watching, and the like, because those opportunities for public recreation do not exist on the Fermi site.

Fermi 3 construction is not expected to provide for greater or reduced recreational opportunities and waterway usage within the vicinity of the Fermi site. ER Subsection 4.4.2.4.5, Recreation, Tourism, Aesthetics, and Land Use, indicates that impacts on recreation and tourism due to construction would be minor and short term, because the only foreseen impact on these facilities is a longer commute time for recreation users or tourists if travel coincides with peak construction worker commutes.

Impacts to recreational use in the vicinity of the transmission corridors are expected to be minor and alleviated by a variety of stewardship measures, including permit compliance and standard industry practices, as discussed in ER Subsection 4.1.2, Transportation Corridors and Offsite Areas, as revised by NRC RAI GE3.1-1.

4.8.1.1.2 Water-Related Recreation

Construction activities associated with Fermi 3 are not expected to obstruct waters currently used by the public for waterskiing, fishing, and other water sports. As indicated in FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, access to the waters and shoreline associated with the Fermi site is currently prohibited. Those existing prohibitions will continue during Fermi 3 construction.

Furthermore, the disposal of dredged or fill material during Fermi 3 construction is not expected to impair or destroy resources supporting recreational activities. The construction of offshore structures (e.g., intake structure, outfall structure, and barge facility) and the discharge of dredged or fill material (e.g., discharge of dredged material onsite) would result in localized impacts on the Fermi site. However, because of the localized nature of the impacts and the public's restricted access to the Fermi site, the construction of offshore structures and the discharge of dredged or fill material will not result in the impairment or destruction of water-related recreational resources or activities available to the public.

Regarding the potential impact on the maintenance of fish populations, ER Subsection 4.3.2.4.2, Commercial and Recreational Aquatic Species, states that the potential impacts from construction activities at the Fermi site to commercial and recreational species would be minimal due to the limited presence of these species within the site. Therefore, construction activities are not expected to cause significant impacts on areas important to the maintenance of fish populations caught as part of recreational fishing activities.

In summary, if there is an impact on the public's water-related recreational resources from Fermi 3 construction, that impact is expected to be minor and short term.

4.8.1.2 Operational Impacts

The following subsections assess the expected impacts associated with Fermi 3 operation on recreational resources. The assessment identifies the impacts pertaining to public recreation, not to recreational resources available to the applicant.

Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for a summary of the anticipated impacts of Fermi 3 operation and the impacts' associated measures and controls.

4.8.1.2.1 General Recreational Activities

Fermi 3 operation is not expected to affect public recreational opportunities on the Fermi site. As stated in ER Section 2.1, Station Location, the Fermi site does not house any recreational facilities. Furthermore, as stated in ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, Detroit Edison does not allow access to the Fermi site for recreational purposes. Therefore, Fermi 3 operation will not affect an area of value for the public's passive recreation, such as photography, birdwatching, walking, people watching, and the like, because those opportunities for public recreation do not currently exist on the Fermi site.

Fermi 3 operation is not expected to provide for greater or reduced recreational opportunities and waterway usage within the vicinity of the Fermi site. Refer to the ER subsections listed below for information concerning the expected impact of Fermi 3 operation on recreational resources and activities available within the vicinity of the Fermi site:

- Subsection 5.8.1, Physical Impacts of Station Operation – Assessment of the expected physical impacts of station operation on the region and nearby communities, including potential impact on recreational facilities.
- Subsection 5.8.1.2, Buildings and Recreational/Cultural Facilities – Assessment of the minimal expected impacts on recreational facilities within the vicinity of Fermi 3, including wildlife conservation areas due to natural buffers onsite.
- Subsection 5.8.2.5, Tourism and Recreation – Assessment of the minimal expected impacts on tourism and recreation from travel past the Fermi site on Dixie Highway at shift change.

In summary, as indicated in ER Subsections 5.8.1.2 and 5.8.2.5, if there are impacts on recreational facilities or tourism and recreation within the vicinity of the Fermi site, those impacts are expected to be minor.

4.8.1.2.2 Water-Related Recreation

Operational activities associated with Fermi 3 are not expected to obstruct waters currently used by the public for waterskiing, fishing, and other water sports. As indicated in FSAR Subsection 2.1.2.3, Arrangements for Traffic Control, access to the waters and shoreline associated with the Fermi site is currently prohibited. Those existing prohibitions will continue during Fermi 3 operation.

Regarding the potential impact on the maintenance of fish populations, refer to ER Subsection 5.3.1.2.3.1, Important Species, for an assessment of expected impacts on commercial and recreational aquatic species resulting from Fermi 3 operation. As indicated in ER Subsection

5.3.1.2.3.1, based on the perennial success of the Lake Erie commercial and recreational fisheries, historical studies, and the closed-cycle cooling system employed by Fermi 3, the impacts of the Fermi 3 intake on important aquatic species (which include commercial and recreational fisheries) are expected to be minor.

Refer to the response to NRC RAI AE2.4.2-2 for the Aquatic Ecology Survey. The Aquatic Ecology Survey provides Fermi site-specific aquatic ecology information and evaluates impingement mortality associated with the intake structure. Refer also to the response to NRC RAI AE5.2.2-1 for a description of the design and operation of the fish screening system at the Fermi 2 intake and for the proposed Fermi 3 intake.

In summary, the impact of Fermi 3 operation on the public's water-related recreational activities is expected to be minor.

4.8.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on recreational resources.

4.8.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, for an assessment of the cumulative impacts associated with socioeconomics. The impacts on recreational resources are generally considered socioeconomic impacts (refer to ER Section 4.4, Socioeconomic Impacts). ER Subsection 4.7.5 states that there is no anticipated cumulative impact involving the socioeconomics of the Fermi site vicinity.

4.8.2.2 Cumulative Impacts of Operation

As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation are not expected to be cumulatively significant relative to the impacts of Fermi 2 operation. There are no other existing or planned projects of a similar scale to Fermi 3 in the vicinity that would result in increased negative cumulative impacts on the identified resource areas. Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, for additional information regarding the expected cumulative impacts associated with Fermi 3 operation.

4.8.3 Mitigation and Monitoring

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a summary of the anticipated impacts of Fermi 3 construction and the impacts' associated measures and controls.

ER Subsection 4.4.2.4.5, Recreation, Tourism, Aesthetics, and Land Use, also notes that no mitigative measures are required to maintain a minor, short-term impact level during Fermi 3 construction; therefore, any permit from the USACE would not require special conditions to protect public recreation within the surrounding area.

Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for a summary of the anticipated impacts of Fermi 3 operation and the impacts' associated measures and controls.

4.9 Public Safety Impact Evaluation

To address the public interest factor, i.e., effects on safety, this section presents a discussion regarding the effects on public safety, with relation to Fermi 3 construction and operations, associated with the following:

- Fermi 2 existing onsite impoundments.
- Impoundments to be constructed for Fermi 3 operations.
- Safe operation of Fermi 2 units during Fermi 3 construction.
- Transportation safety on roadways.
- Social services (e.g., emergency response like ambulance and police).
- Crowded boating conditions.

Additionally, cumulative impacts related to public safety and the potential need for mitigation and monitoring to protect this public interest factor are presented in the following paragraphs.

4.9.1 Existing Onsite Impoundments Construction Impacts

As stated in ER Subsection 2.3.1, Hydrology, there are no significant impoundments, reservoirs, estuaries, or the existing onsite impoundments at the Fermi site, as presented in Section 3.10 of the USACE Report, are all man-made and are used to collect and confine water and dredged material in support of Fermi 2 operations. These existing onsite impoundments include the following:

- CWS Reservoir.
- Dredged Material Disposal Basin.
- Quarry Lakes.

This subsection presents the impacts on public safety associated with these existing impoundments as they relate to the construction and operation of Fermi 3.

4.9.1.1 Circulating Water System Reservoir

Fermi 3 construction is not expected to affect public safety related to the continued safe operation of Fermi 2. The CWS reservoir supports the operation of Fermi 2, but does not affect the safety of Unit 2. Further, construction or operation of Fermi 3 is not dependent on CWS reliance; the CWS reservoir will continue to operate normally during Fermi 3 construction.

4.9.1.2 Dredged Material Disposal Basin

The dredged spoils area has been functional since 1978 and has supported the operation of Fermi 2 with no impacts on public safety. The basin is located in the southern portion of the site adjacent to Lake Erie.

ER Subsection 2.3.1.1.3.3, Plant Intake/Discharge Interface with Lake Erie, states that the existing local impoundment currently used to receive dredging material associated with the Fermi 2 intake structure maintenance will be used during the dredging associated with the construction of the

Fermi 3 intake structure. Refer to the NRC RAI HY4.2.1-7 response for a discussion of the dredged spoils disposal basin management related to its capacity to accommodate dredged material.

As indicated above, the dredged spoils disposal basin has been operating for more than two decades with no failures, incidents, or problems. If the dredged spoils disposal basin embankment were to fail, the sediment and decant water could potentially flow toward the south lagoon and into Lake Erie; however, it is anticipated that the impact on the south lagoon and Lake Erie would be to a localized area. As such, the impact on the south lagoon and a localized area within Lake Erie from a dredged spoils disposal basin embankment failure is anticipated to be minor and short term. Additionally, the dredged spoils disposal basin is located within the property boundary for Fermi 2 where public access is prohibited.

4.9.1.3 Quarry Lakes

The Quarry Lakes were created in 1971, when onsite quarrying operations ceased and the quarry areas were allowed to fill with groundwater. There are no Fermi 2 operations or recreational activities associated with these lakes, and these lakes are located within the property boundary of the Fermi site. The Quarry Lakes will not be used for the construction or operation of Fermi 3. Thus, there would be no impact on public safety from the Quarry Lakes during Fermi 3 construction or operation.

4.9.2 Fermi 3 Plant Construction and Public Safety

The following subsections provide a discussion of the identification, evaluation, and mitigation of potential impacts on public safety related to Fermi 3 construction.

4.9.2.1 Fermi 3 Construction and Public Safety

FSAR Section 1.12, Impact of Construction Activities on Fermi 2, evaluates the potential hazards to safety-related structures, systems, and components of the operating unit. FSAR Section 1.12 also discusses the managerial and administrative controls used to ensure that the Fermi 2 is not adversely affected as a result of Fermi 3 construction activities. Based on the appropriate implementation of protective measures, it is anticipated that Fermi 3 construction activities will not adversely affect the operation of Fermi 2.

4.9.2.2 Transportation Impacts During Fermi 3 Construction

ER Subsection 4.4.2.4.2, Transportation, as revised by NRC RAI SE4.4.2-10 and NRC RAI TR4.8.3-2, evaluates the potential impact on regional transportation from the additional traffic associated with construction activities. As discussed in the revised ER Subsection 4.4.2.4.2, there may be up to 5,000 workers commuting to the Fermi site if Fermi 2 refueling activities coincide with the time of peak Fermi 3 construction employment. Detroit Edison performed a Level of Service traffic study that involved collecting traffic count data during and after a Fermi 2 refueling outage in order to factor in the fluctuation of vehicles accessing the site during these time. The Level of Service traffic study analyzed the effects that both the projected operations and construction workforces will have on traffic flows in the vicinity of the Fermi site when combined with existing Fermi 2 traffic. The greatest negative impacts are projected to occur in 2017 when the construction workforce is at its peak of 2,900 workers. However, it has been determined that a great deal of the traffic impacts can be minimized by implementing improvements such as signal installations and modifications, staggering worker shifts, busing employees from offsite, minor lane additions and/or a second entrance to the site. Implementation of measures such as the above impacts associated with increased traffic are expected to be minor and short term.

Refer to the NRC RAI SE4.4.2-10 response for the Level of Service analysis that identifies the measures to mitigate traffic impacts.

4.9.2.3 Impacts on Public Safety and Social Services During Fermi 3 Construction

Impacts on public safety and social services are not anticipated during construction of Fermi 3. ER Subsection 4.4.2.4.3, Public Safety and Social Services, states that the construction activities associated with Fermi 3 could potentially result in a slight increase in demand for safety and social services due to workers relocating to the primary impact area counties (Monroe, Wayne, and Lucas counties). These services could include demands for police, fire, ambulance, and hospital services. Fermi 3 construction activities have the potential to negatively affect local community public safety facilities and services because of the services needed by the site. Refer to the response to NRC RAI SE 4.4.2-2 for correspondence used to support analysis in the ER sections on public safety and social services.

4.9.3 Fermi 3 Plant Operations and Public Safety

The following subsections discuss impacts related to Fermi 3 plant operations and public safety.

4.9.3.1 Transportation Impacts During Fermi 3 Operations

ER Subsection 5.8.2.4.2, Transportation, as revised by NRC RAI TR4.8.3-2, indicates that transportation impacts due to Fermi 3 operations will include those arising from the estimated 900 member operational workforce, deliveries dispersed throughout the day, and the periodic need for maintenance workers (this number may peak at 1,200 to 1,500 workers during the refueling and maintenance outages that are expected to occur every two years). Refer to revised ER Subsection 5.8.2.4.2 for a description of transportation impacts during Fermi 3 operations. Because Fermi 2 and Fermi 3 would not typically be in a refueling or maintenance outage concurrently, the Fermi 3 outage traffic would be comparable to Fermi 2 outages. Additionally, the expansion of Fermi Drive during Fermi 3 construction is a permanent improvement that will help ease congestion during the Fermi 3 operational phase.

It is expected that low-cost or no-cost measures would be implemented to lessen transportation impacts, such as staggering the shift start time for the two-unit operating staff and encouraging carpooling. While, as stated in the revised ER Subsection 5.8.2.4.2, measures will be implemented to lessen transportation impacts, there is a potential for major, short-term traffic impacts near the site during refueling operations. The Level of Service Analysis in the NRC RAI SE4.4.2-10 response characterizes additional mitigation measures beyond those already proposed to lessen the traffic impacts.

4.9.3.2 Impacts on Public Safety and Social Services During Fermi 3 Operations

Because the Fermi 3 plant would be operated according to the required codes, specifications, and regulations, impacts on public safety from Fermi 3 operations are not expected

Potential impacts on public safety and social services during Fermi 3 operations are described in ER Subsections 5.8.2.4, Local Public Services and 5.8.2.4.3, Public Safety. Refer to the response to NRC RAI SE 4.4.2-2 for correspondence used to support analysis in the ER sections on public safety and social services.

ER Subsection 5.8.2.4, Local Public Services, includes a discussion of public service needs associated with Fermi 3 operations. It is expected that emergency, medical, fire, law enforcement, and other offsite response support to the Fermi site would be performed in accordance with agreements established in the Fermi Emergency Plan, contained in Part 5 of the COL application. These emergency responders are aware of the activities at the Fermi site and are prepared to respond.

4.9.4 Impacts on Boating Safety During Fermi 3 Construction and Operation

The construction and operation of Fermi 3 is not expected to contribute to or encourage crowded boating conditions in the area of the Fermi site on Lake Erie, because of the presence of the security zone. The security zone is a designation of all waters and adjacent shoreline of Fermi 2 and Fermi 3, as set forth in 33 CFR 165.915. Entry into this zone is prohibited unless authorized by the USCG (Reference 4.9-1).

4.9.5 Cumulative Impacts

Cumulative impacts related to transportation, public safety, and social services and Fermi 3 construction are addressed in ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources. Cumulative impacts related to transportation, public safety, and social services and Fermi 3 operations are addressed in ER Subsection 5.11.4.3, Socioeconomic, Historical and Cultural Resources.

4.9.6 References

- 4.9-1 Code of Federal Regulations, Title 33: Navigation and Navigable Waters, Part 165 – Regulated Navigation Areas and Limited Access Areas, Subpart F – Specific Regulated Navigation Areas and Limited Access Areas Ninth Coast Guard District, "Section 165.915 Security zones; Captain of the Port Detroit", (a) Security zones, (1) Enrico Fermi 2 Nuclear Power Station, <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9daea5c917173c9815508be259994aa&rgn=div8&view=text&node=33:2.0.1.6.34.6.196.133&idno=33>, accessed 5 May 2008.

4.10 Historic Properties

The following subsections assess the expected impacts on historic properties and archaeological resources during the construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on aboveground properties and archaeological resources within the Fermi site area.

4.10.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operation activities on historic properties and archaeological resources. As indicated in ER Subsection 2.5.3, Historic Properties, the baseline information and impact analysis development included review resources such as the National Register of Historical Places (NRHP), records maintained at the Office of the State Archaeologist and the State Historic Preservation Office (SHPO), the State of Michigan Archives, the Monroe County Library System's Ellis Reference and Information Center, and the Monroe County Museum. As indicated by this review, registered historical sites will not be affected by the proposed construction or operational activities associated with Fermi 3.

As indicated in ER Subsection 2.5.3.3, Consultation, inquiries were made with Native American tribal agencies with historic ties to the Fermi site's geographic area. These consultations did not identify any concerns associated with further development of the Fermi site. Because of the research and consultations, the construction and operation of Fermi 3 is not expected to affect areas designated as archaeological resources, including Native American religious or cultural sites.

Refer to ER Subsection 2.5.3.1, Prior Cultural Resources Surveys, as revised by NRC RAI GE3.1-1, and Subsection 2.5.3.2, Current Cultural Resources Survey, for information on cultural resources and historic properties on or near the offsite transmission corridors. The Cultural Resources investigation

of the transmission line was limited to the segment extending from the Sumpter-Post Road junction to the Milan substation site. The results of the investigation are summarized in ER Subsection 2.5.3.4, Archaeological Site Results and related subsections, indicating that while there is a moderate to high potential for encountering archaeological resources, none were considered likely to be eligible for listing in the National Register of Historic Places.

4.10.1.1 Construction Impacts

Refer to ER Subsection 4.1.3, Historic Properties, as revised by NRC RAI GE3.1-1, for an assessment of the expected effects of Fermi 3 construction activities on historic resources (archaeological and aboveground) on the Fermi site and within a 10-mi. radius of the project area. As stated in ER Subsection 4.1.3, archaeological resources are often assessed with regard to direct damage to a site or site element. Aboveground resources are assessed for a wider variety of impacts that may include visual or noise-related indirect impacts.

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a summary of the expected impacts on historic properties (archaeological and aboveground resources) resulting from the construction of Fermi 3.

4.10.1.1.1 Aboveground Properties

Refer to ER Subsection 4.1.3.1.2, Above-Ground Resources Sites, as revised by NRC RAI GE3.1-1, for an assessment of the expected effects of Fermi 3 construction activities on historic properties. As indicated in the revised ER Subsection 4.1.3.1.2, Fermi 3 construction will not affect currently listed NRHP or NRHP-eligible aboveground resources on the Fermi site, because there are none. A preliminary assessment of Fermi 1 was completed after submission of the Fermi 3 COL application. The preliminary assessment, titled "Preliminary National Register of Historic Places Evaluation for the Enrico Fermi Atomic Power Plant Monroe County, Lagoona Beach, Michigan" (Fermi 1 Assessment), recommends that Fermi 1 is eligible for listing in the NRHP under Criteria A and C for its role in the development of the U.S. nuclear power industry. A determination by the Michigan SHPO is pending. If the SHPO determines that Fermi 1 is eligible for listing in the NRHP, mitigation would be necessary. As stated within the Fermi 1 Assessment, alternative mitigation strategies would need to be developed because physical preservation of the plant does not achieve a preservation purpose, nor is the displaying of objects from within the plant feasible due to the size of the hardware and the difficulties of radioactive material decontamination. A determination by the Michigan SHPO is pending.

The revised ER Subsection 4.1.3.1.2 also assesses the expected impact of Fermi 3 construction on historic properties within a 10-mi. radius of the Fermi site. The expected impact is minor. The revised ER Subsection 4.1.3.1.2 states that two cooling towers currently exist within the viewshed, so the addition of another cooling tower would not substantively alter any of the characteristics that contribute to the eligibility of any of these resources for the NRHP.

4.10.1.1.2 Archaeological Resources

Refer to ER Subsections 4.1.3.1, Site and Vicinity and 4.1.3.1.1, Archaeological Sites, as revised by NRC RAI GE3.1-1, for an assessment of the expected impacts on archaeological resources resulting from Fermi 3 construction activities. As stated in ER Subsection 4.1.3.1, the archaeological APE is situated entirely within the project area; therefore, construction impacts on archaeological resources would occur only within the archaeological APE. As indicated in ER Subsection 4.1.3.1.1, no significant impacts on archaeological resources are expected, because no NHRP-eligible archaeological resources within the Fermi site and vicinity are located within the archaeological APE.

4.10.1.1.3 Maritime Resources

As stated in Subsection 3.11.3, a Submerged Site Sensitivity Study (Study) documents efforts completed in 2009 to assess the proposed project's potential to impact underwater resources within the APE. The Study found that four previously identified shipwrecks are located within three mi. of the near-shore dredging/outfall activity area. No submerged resources have been recorded within the activity area. The closest recorded submerged site, the submerged steamer yacht Adieu, is located within 0.6 mi. north of the activity area. No formal maritime surveys have been conducted in the activity area; however, Fermi 3 project activities are deemed unlikely to affect submerged prehistoric archaeological sites.

4.10.1.2 Operational Impacts

Refer to ER Subsection 5.1.3, Historic Properties, for an assessment of the expected effects of Fermi 3 operational activities on historic resources (archaeological and aboveground) on the Fermi site and within a 10-mi. radius of the project area.

Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for a summary of the expected impacts on historical properties (archaeological and aboveground resources) resulting from the operation of Fermi 3 and associated measures and controls.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAIs GE3.1-1 and SE4.4.2-10, for a listing of expected adverse impacts resulting from the operation of Fermi 3, associated mitigation measures, and resulting unavoidable adverse impact.

4.10.1.2.1 Aboveground Properties

Refer to ER Subsections 5.1.3, Historic Properties and 5.1.3.2, Above-Ground Resources Sites, for an assessment of the expected effects of Fermi 3 operational activities on historic properties. As indicated in ER Subsection 5.1.3.2, no aboveground resources within the Fermi 3 project area have been determined to be NRHP-eligible; therefore, Fermi 3 operational activities would not affect resources listed in the NRHP or those determined eligible for listing in the NRHP. The expected impact to historic aboveground resources within the 10-mi. radius of Fermi 3 would be minor, because the operational activities associated with Fermi 3 affecting these sites are limited to noise-related and visual impacts. As stated in ER Subsection 5.1.3.2, two cooling towers currently exist within the viewshed; any additional impacts associated with Fermi 3 operation would not introduce elements that are substantively different from those that already exist.

4.10.1.2.2 Archaeological Resources

Refer to ER Subsection 5.1.3.1, Archaeological Sites, for an assessment of the expected effects of Fermi 3 operational activities on archaeological resources. As indicated in ER Subsection 5.1.3.1, because no archaeological findings are evident on the site, no significant operational impacts are expected.

4.10.1.2.3 Maritime Resources

A submerged site sensitivity study was completed and no maritime resources were recorded within the near-shore dredging/outfall activity area. No formal maritime surveys have been conducted in the activity area. The closest recorded submerged site, the submerged steamer yacht Adieu, is located within 0.6 mi. north of the activity area. No significant operational impacts are expected.

4.10.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts resulting from the construction and operation of Fermi 3 on historic properties and archaeological resources.

4.10.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, for an assessment of the expected cumulative impacts on historical properties (archaeological and aboveground resources) associated with the construction of Fermi 3. Refer to ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, for information regarding the transmission line construction. As indicated in ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, the expected cumulative impacts on historical properties would be minor.

4.10.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.4.3, Socioeconomic, Historical and Cultural Resources, for an assessment of the expected cumulative impacts on historical properties (archaeological and aboveground resources) associated with the operation of Fermi 3. As indicated in ER Subsection 5.11.4.3, the expected cumulative impacts on historical properties would be minor.

4.10.3 Mitigation and Monitoring

ER Subsection 4.1.3.1.1, Archaeological Sites, as revised by NRC RAI GE3.1-1, indicates that Detroit Edison intends to implement controls during construction excavation to ensure compliance with the Native American Graves Protection and Repatriation Act (NAGPRA). As indicated in ER Subsection 4.7.5, Socioeconomic, Environmental Justice, Historic and Cultural Resources, approved procedures will be implemented to ensure that either known or newly discovered historic and cultural sites will not be inadvertently affected during onsite construction activities.

As indicated by ER Subsection 10.3.2, Construction of Fermi 3 and Long-Term Productivity, newly discovered archaeological sites located in the construction area of Fermi 3 would be managed in cooperation with the Michigan SHPO. Additional coordination with the Orissa Society of America also may occur. Appropriate mitigation measures would be implemented as needed to ensure protection or preservation of archaeological sites.

Refer to the response to NRC RAI CR4.1.3-4 for additional information regarding procedures or similar guidance to be followed in the event that unanticipated archaeological resources or human burials are identified during construction.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAIs GE3.1-1 and SE4.4.2-10, for a listing of mitigation measures and associated expected adverse impacts resulting from the operation of Fermi 3.

4.11 Flood Hazards and Floodplain Values

The following subsections assess the proposed project's impact on flood hazards and natural and beneficial floodplain values during the construction and operation of the Fermi 3 project, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify any cumulative impacts. As noted in 33 CFR 230.50 (l), a project should avoid, to the extent practicable, long- and short-term significant adverse impacts associated with the occupancy and modification of floodplains. In addition, a project should minimize the impacts of potential flooding to human health, safety, and welfare as well as preserve the natural and beneficial values of the floodplains.

4.11.1 Direct and Secondary Impacts

The ER addresses probable impacts in terms of construction-related actions and long-term operations.

4.11.1.1 Construction Impacts

The Fermi 3 ER describes steps to be taken during construction to minimize impacts related to flooding and floodplains, including the following specific subsections:

- Subsection 2.3.1.1, Surface-Water Resources, which contains information on the minimal hydrographic modifications within the region associated with Fermi 3 construction and operation.
- Subsection 4.2.1, Hydrologic Alterations, which contains information on compliance with hydrological mitigation standards and regulations during construction.
- Subsection 4.2.1.7, Floodplains and Wetlands, which describes the construction site grade elevation in relation to the floodplain.
- Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, and Subsection 4.2.1.9, Hydrologic Alteration Best Management Practices and Measures, which include a summary of construction plans and hydrologic alteration minimization measures during construction.
- Subsection 5.6.1.4, Wetlands and Floodplains, which indicates that transmission construction impacts to floodplains would be minimal and controlled through standard industry practices.

In summary, the ER describes the design and procedural attributes during the construction process for Fermi 3 so that if there are any impacts on flood-related issues from Fermi 3 construction, those impacts are expected to be minor and short term.

4.11.1.2 Operational Impacts

Refer to ER Subsection 5.2.1.6, Operational Activities Causing Other Hydrologic Alterations, for a discussion of the minimization of hydrologic alterations and physical impacts associated with Fermi 3 operations. If there are any impacts on flood-related issues from Fermi 3 operation, those impacts are expected to be minor.

4.11.2 Cumulative Impacts

Separate sections of the Fermi ER address the cumulative impacts of Fermi 3 construction and the cumulative impacts of operation. Both sections indicate that, if there are any cumulative impacts on flood-related issues from Fermi 3 operation, those impacts are expected to be minor.

Likewise, the Fermi site and Fermi 3 project activities are located in an area where water levels are largely under the static level control of the Great Lakes and Lake Erie. The volume of this contiguous water system is so vast that this project and similar projects would not induce any measurable change in the system's water level behavior. No impacts on flood hazards and floodplain values are expected. Refer to the response to NRC RAI HY4.2.1-2 for a characterization of all possible hydraulic connections among the bedrock aquifer under the Fermi site, the surface waters (including wetlands, lagoons, canals, ponds, and Lake Erie) in the vicinity of the site, and the existing and proposed gravel fills at the Fermi site.

References to individual information sources are presented in the following subsections.

4.11.2.1 Cumulative Impacts of Construction

Refer to ER Subsections 4.7.3, Hydrology, Water Use, and Water Quality and 4.7.3.2, Surface Water Quality, for a summary of the cumulative impacts of Fermi 3 construction on hydrology and surface water quality, including the minimization of flood hazards and the minimization of impacts related to natural and beneficial floodplain values.

4.11.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.9, Conclusion, for a summary of the cumulative impacts of Fermi 3 operation, including water impacts and regulatory compliance.

4.11.3 Mitigation and Monitoring

No additional mitigation and monitoring activities have been planned for the Fermi 3 project beyond the design construction grade information and other construction-related actions referenced above.

4.12 Shore Erosion and Accretion

The following subsections assess the proposed project's impact on shore erosion and accretion during construction and operation of the Fermi 3 project, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify any cumulative impacts. The project would not be expected to accelerate erosion on the site shore property or along adjacent shore areas.

4.12.1 Direct and Secondary Impacts

The ER addresses probable impacts in terms of construction-related actions and long-term operations.

4.12.1.1 Construction Impacts

The Fermi 3 ER describes steps to be taken during construction to minimize impacts, including those in the following specific subsections:

- Subsection 2.3.1.1, Surface-Water Resources, which includes a statement on the minimal hydrographic modifications.

- Subsection 4.2.1, Hydrologic Alterations, which includes information on compliance with hydrological mitigation standards and regulations during construction.
- Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, and Subsection 4.2.1.9, Hydrologic Alteration Best Management Practices and Measures, which present a summary of the construction plans and hydrologic alteration minimization measures during construction.
- Subsections 4.2.2.2, Water Quality of Bodies Receiving Construction Effluents and 4.2.2.6, Proposed Practices to Control Water-Use Impacts, which include descriptions of activities to minimize the impact on the water quality of waters receiving construction effluents.

Refer to the response to NRC RAI HY4.6-1 for additional information associated with the SESC Plan to be implemented during Fermi 3 construction.

As indicated in the ER sections referenced above, because of the lack of shoreline-related activities, the proposed construction activities associated with Fermi 3 are unlikely to cause notable accretion or erosion issues along adjacent shoreline areas. In summary, if Fermi 3 construction activities have any impact on shore erosion or accretion, those impacts are expected to be minor and short term.

4.12.1.2 Operational Impacts

Refer to ER Subsection 2.3.1.1.3, Lake Erie Western Basin, for information about the offshore discharge selected to avoid impacts, minimal gradients and currents, and shoreline bank height. All of these items relate to erosion/accretion impacts.

Refer to ER Subsections 5.2.1.6, Operational Activities Causing Other Hydrologic Alterations, 5.3.1.1.2, Physical Impacts, and 5.3.2.1.2, Other Physical Impacts, for discussions of the minimization of hydrologic alterations and physical impacts associated with Fermi 3 operations.

Based on the ER information referenced in this and the preceding subsection, the project is not expected to affect the current rate of erosion or accretion experienced by the Fermi site and adjacent properties, because the Lake Erie shoreline during Fermi 3 operation would be largely the same as the current shoreline maintained during Fermi 2 operation.

4.12.2 Cumulative Impacts

Separate sections of the Fermi ER address the cumulative impacts of Fermi 3 construction and the cumulative impacts of operation. Both sections indicate that, if there are any cumulative impacts on shore erosion and accretion from Fermi 3 operation, those impacts are expected to be minor.

References to individual information sources are presented in the following subsections.

4.12.2.1 Cumulative Impacts of Construction

Refer to ER Subsections 4.7.3, Hydrology, Water Use, and Water Quality, and 4.7.3.2, Surface Water Quality, for a summary of the cumulative impacts of Fermi 3 construction on hydrology and surface water quality, including the minimization of erosion.

4.12.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.9, Conclusion, for a summary of the cumulative impacts of Fermi 3 operation, including water impacts and regulatory compliance.

4.12.3 Mitigation and Monitoring

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 construction and the mitigation measures that may reduce those impacts, including erosion control measures expected to be implemented during construction of Fermi 3.

Refer to the response to NRC RAI HY4.6-1 for additional information associated with the SESC Plan to be implemented during Fermi 3 construction.

No additional mitigation and monitoring activities have been planned for the Fermi 3 project beyond the general construction-related actions referenced above and those outlined in the USACE permit.

4.13 Water Supply and Conservation

The following subsections assess the proposed project's impact on water supply and conservation activities during the construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify any cumulative impacts. As noted in 33 CFR 320.4(m), "Water conservation requires the efficient use of water resources in all actions which involve the significant use of water or that significantly affect the availability of water for alternative uses including opportunities to reduce demand and improve efficiency in order to minimize new supply requirements..." As noted in 40 CFR 230.50, "Discharges can affect the quality of water supplies with respect to color, taste, odor, chemical content and suspended particulate concentration, in such a way as to reduce the fitness of the water for consumption..."

4.13.1 Direct and Secondary Impacts

The ER addresses probable impacts in terms of construction-related actions and long-term operations. There are no water intakes in the area that are likely to be affected, and no anticipated impacts on any drinking water aquifer.

The project would not be expected to limit the potential water supply needs of other users.

4.13.1.1 Construction Impacts

Fermi 3 construction will include dewatering and water used for such activities as concrete batch plant operation, dust suppression, and sanitary needs. The Fermi 3 ER describes construction water use and steps expected to be taken during construction to minimize water use impacts, including information in the following specific subsections:

- Subsection 4.2.1, Hydrologic Alterations, which contains information on compliance with hydrological mitigation standards and regulations during construction.
- Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, which includes a summary list of construction activities including dewatering of foundation excavations.
- Subsection 4.2.1.3, Construction Water Sources, which presents a summary of construction water sources and quantities used.
- Subsection 4.2.1.5, Effects of Dewatering, which presents a summary of the effects of dewatering during construction.

- Subsection 4.2.1.8, Groundwater and Surface Water Users, which includes a description of surface and groundwater users potentially affected by the Fermi 3 hydrologic alterations. Notably, the only surface water user potentially affected by Fermi 3 construction is Fermi 2.
- Subsection 4.2.2.1, Construction Activities Potentially Impacting Water Use, which presents an overview of construction water use management.
- Subsection 4.2.2.3, Water Quantity Used and Quantity Available to Other Users, which assesses the expected impact on other nearby users of groundwater.
- Subsection 4.2.2.5, Effects of Alterations on Other Water Users, which notes the negligible (if any) effects of alterations on other users during Fermi 3 construction.

In summary, the ER describes the design and procedural attributes to be implemented during Fermi 3 construction. Implementation will help ensure that if there are any impacts on water use/water supply from Fermi 3 construction, those impacts are expected to be minor and short term.

4.13.1.2 Operational Impacts

Refer to ER Section 3.3, Plant Water Use, for a description of the Fermi 3 water requirements associated with cooling and operational activities. Specifically, refer to ER Figure 3-3.1, Water Use Diagram, for a detailed water use diagram and water balance for Fermi 3 operations, including water intake and evaporative losses.

Refer to ER Section 5.2, Water-Related Impacts, and specifically ER Subsection 5.2.2, Water-Use Impacts, for details on water use and water use impacts associated with Fermi 3 operations. Refer also to the response to NRC RAI HY5.3.2-4, for additional information regarding the choice to use a single-port CORMIX 1 model to model the thermal plume to evaluate the effects of rare westward currents, while a multiple port CORMIX 2 model was used for other thermal plume modeling.

As noted in ER Subsection 5.2.1.4, Present and Future Surface Water Uses Potentially Affecting Available Water Supply, the consumptive water needs of Fermi 3 are a small fraction of the present and projected future consumptive water needs of other Lake Erie surface water users. Therefore, as also noted in that subsection, considering the vast size of Lake Erie, if there are any impacts on available water supply and other water users from Fermi 3 operations, the expected impacts would be minor.

Refer to ER, Section 5.4.1.1, Liquid Pathways, for radiological exposure models for liquid discharges to Lake Erie. Refer to the responses to NRC RAIs HH5.4.1-1 and HH5.4.1-2 for additional information regarding liquid discharges.

4.13.2 Cumulative Impacts

Separate sections of the Fermi ER address the cumulative impacts of Fermi 3 construction and operation. Both sections indicate that, if there are any cumulative impacts on water use from Fermi 3, those impacts are expected to be minor.

References to individual information sources are presented in the following subsections.

4.13.2.1 Cumulative Impacts of Construction

Refer to ER Subsections 4.7.3, Hydrology, Water Use, and Water Quality; 4.7.3.1, Surface Water Use; and 4.7.3.3, Groundwater Use, for summary discussions of the cumulative impacts of Fermi 3 construction on water use.

4.13.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.3, Water Use and Quality, for a summary of the cumulative impacts of Fermi 3 operation on water use.

4.13.3 Mitigation and Monitoring

Mitigation beyond the plans referenced in ER Subsections 2.3.2, Water Use and Section 4.2, Water-Related Impacts is not needed or planned.

The following ER subsections address monitoring:

- Subsection 2.3.2.1.4, Statutory and Legal Restrictions on Surface-Water Use, which contains a description of surface water use reporting.
- Subsection 6.3.2, Construction Monitoring, which includes a description of construction monitoring related to dewatering.

4.14 Energy Needs and Energy Conservation and Development Impact Evaluation

The following subsections assess the proposed project's impact on energy needs and address energy conservation and development during the construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts.

4.14.1 Direct and Secondary Impacts

The ER addresses the expected construction and operational impacts of Fermi 3 on energy needs and addresses energy conservation and development within ER Chapter 8, Need for Power and Chapter 10, Environmental Consequences of the Proposed Action.

4.14.1.1 Construction Impacts

Refer to ER Subsection 10.2.2.3, Energy Consumption, for a discussion of the energy requirements associated with the construction of Fermi 3. As suggested in ER Subsection 10.2.2.3, the expected energy impacts associated with the Fermi 3 construction are expected to be minor, short-term negative impacts.

4.14.1.2 Operational Impacts

Refer to ER Section 8.4, Assessment of Need For Power and Subsection 10.2.2.3, Energy Consumption, for a discussion of the operational impacts associated with Fermi 3 operation on energy needs and energy conservation and development. The expected operational impacts of Fermi 3 on energy needs and energy conservation and development include meeting the following needs:

- Additional baseload capacity.

- Diversification of energy sources.
- Reduced average cost of electricity to consumers.
- Reduced reliance on fossil fuels and increased energy security.

As discussed in ER Section 8.4, Assessment of Need for Power, and summarized in Section 10.4, Benefit-Cost Balance, there is a growing baseload demand and growing baseload supply shortfall for the region of interest. Without additional capacity, the electric network will fail to maintain an adequate reserve margin. Fermi 3 will help meet the growing baseload shortfall in the region by supplying an average annual electrical-energy generation of approximately 12,000,000 megawatt-hours (MWh).

Fermi 3 will generate electricity with significantly reduced carbon dioxide emissions with respect to comparably sized coal-fired or natural gas-fired alternatives. Fermi 3 would also have important strategic implications in terms of lessening the dependence of the United States on foreign fuel imports, fuel supply disruptions, and vulnerability to price volatility or politics. Therefore, the expected operational impacts of the project on energy needs and energy conservation and development are major, long term, and positive.

4.14.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on energy needs and energy conservation and development.

4.14.2.1 Cumulative Impacts of Construction

Refer to ER Section 4.7, Cumulative Impacts of Construction, for an assessment of all expected cumulative impacts associated with the construction of Fermi 3. ER Section 4.7 does not identify any expected cumulative impacts regarding energy needs and the energy conservation and development associated with Fermi 3 construction.

4.14.2.2 Cumulative Impacts of Operation

As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation are not expected to be cumulatively significant relative to the impacts of Fermi 2 operation. Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, for additional information regarding the expected cumulative impacts associated with Fermi 3 operation.

4.14.3 Mitigation and Monitoring

As indicated in ER Subsection 10.2.2.3, Energy Consumption, the construction of Fermi 3 will require the consumption of energy. Mitigative measures are not expected to be required to maintain a minor, short-term negative impact level on energy resources during the construction of Fermi 3; therefore, any permit from the USACE would not require special conditions.

As indicated in ER Sections 8.4, Assessment of Need for Power and 10.4, Benefit-Cost Balance, the expected operational impacts of Fermi 3 on energy needs and energy conservation are major, long term, and positive; therefore, any permit from the USACE would not require special conditions.

4.15 Land Use

The following subsections provide an assessment of the proposed project's impact on land use during the construction and operation of Fermi 3, discuss the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on the land use of the Fermi area.

4.15.1 Direct and Secondary Impacts

The ER addresses the impacts of Fermi 3 construction and operational activities on land use characteristics of the Fermi site and the surrounding vicinity.

4.15.1.1 Construction Impacts

Refer to ER Section 4.1, Land-Use Impacts, for a complete discussion of the expected impact on land use at the Fermi site and within its vicinity associated with the construction of Fermi 3.

Refer to ER Subsection 2.2.2.2, Proposed Transmission System Modifications and Land Use; 4.3.1.5, Transportation Corridors and Other Offsite Areas; 4.3.2.3, Impacts to Transportation Corridors and Offsite Areas; and 4.7.4, Ecology, as revised by NRC RAI GE3.1-1, regarding land use impacts from transmission line construction.

As indicated within ER Section 4.1, the expected land use impacts related to the construction of Fermi 3 are minor and short term. Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a concise description of expected land use impacts or actions at the Fermi site and within its vicinity, and a listing of specific measures and controls to be utilized by the project to limit land use impacts.

The construction of Fermi 3 is consistent with the existing zoning for the area. As indicated in ER Subsection 4.1.1.2.1, Local Monroe County and Frenchtown Township Land Use, the construction of Fermi 3 will comply with Monroe County and Frenchtown Charter Township land use plans and policies and county zoning regulations and their specified uses. As indicated in ER Subsection 4.1.1.2.1, no impacts on land use planning in Monroe County or Frenchtown Charter Township are expected as a result of Fermi 3 construction because the construction of Fermi 3 will comply with applicable Monroe County and Frenchtown Charter Township land use and zoning regulations.

The state has not yet issued its respective permits for the project; however, as indicated within ER Section 1.2, Status of Review, Approvals, and Consultations, Detroit Edison will obtain all the necessary authorizations prior to initiating regulated activities associated with the construction and operation of Fermi 3. Obtaining the necessary authorizations from state and local entities will aid in ensuring the proposed project's compliance with state and local land use goals.

The construction of Fermi 3 is not expected to encourage a trend of converting wetlands or shallow waters, nor high erosion or flood-prone areas for residential development. As indicated in ER Subsection 4.1.1.2.1, Local Monroe County and Frenchtown Township Land Use, Fermi 3 may encourage industrial and economic development within Monroe County; however, it is deemed unlikely that construction of Fermi 3 would cause a change in land use patterns. This is in light of guidance in the draft Monroe County Comprehensive Plan that encourages retaining agriculture as the predominant land use in Monroe County (Reference 4.15-1).

The proposed project is not expected to encourage a trend of developing natural areas rather than recycling abandoned, previously developed areas to more intensive or better use. Instead, the Fermi 3 project proposes to continue the development of the existing Fermi site, which is, as indicated in ER Subsection 4.1.1.2.1, already zoned as public service (PS) and used for utility

purposes. In addition, as indicated in ER Subsection 4.1.1.2.3, Federal, Regional, and State Land Use Plans, construction of Fermi 3 is compatible with the plans and agreements governing the inclusion of portions of the Fermi site within the DRIWR Lagoon Beach Unit managed by the USFWS.

In summary, the project's expected construction-related effects on land use would be minor and short term.

4.15.1.2 Operational Impacts

Refer to ER Section 5.1, Land-Use Impacts, for a complete discussion of the expected impacts on land use at the Fermi site and within its vicinity associated with operational activities. As indicated in ER Subsection 5.1.1, The Site and Vicinity, no new areas are expected to be disturbed after the construction phase ends, and no new agricultural crop production is expected to occur on the Fermi site, because the site is largely dedicated to the DRIWR beyond the area of the power plant structures. Therefore, operations at the Fermi site are expected to have minor impacts on the natural areas during operation as the disturbance from construction is restored to wildlife habitat.

4.15.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on land use.

4.15.2.1 Cumulative Impacts of Construction

Refer to ER Subsection 4.7.1, Land Use, as revised by NRC RAI GE3.1-1, for an assessment of the expected cumulative impacts on land use associated with the construction of Fermi 3. Refer to ER Subsection 4.7.4, Ecology, as revised by NRC RAI GE3.1-1, for information on cumulative impacts associated with transmission line construction. As indicated in the revised ER Subsection 4.7.1, the expected cumulative impacts on land use attributable to Fermi 3 construction activities would be minor.

4.15.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.1, Land Use, as revised by NRC RAI GE3.1-1, for an assessment of the expected cumulative impacts on land use associated with the operation of Fermi 3. Refer to ER Section 5.11, Land Use and Subsection 5.11.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, for information on cumulative impacts associated with transmission line operation. As indicated in ER Subsection 5.11.1, the expected cumulative impacts on land use would be minor.

4.15.3 Mitigation and Monitoring

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a listing of the specific actions to limit Fermi 3 construction impact and any necessary mitigative actions.

As indicated in ER Section 4.1, Land-Use Impacts, mitigation measures are generally not required to maintain the expected minor impacts on land use resulting from Fermi 3 construction activities. The exception, as mentioned in ER Subsection 4.1.1.2.2, Agricultural and Soil Issues, as revised by NRC RAI GE3.1-1, NRC RAI HY4.2.1-9, and NRC RAI LU4.1.1-1, concerns the discharge of construction stormwater. Mitigation measures may be incorporated into the SESC Plan. Therefore, any permit from the USACE would not require special conditions to protect the land use of the surrounding area from construction activities.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1, and NRC RAI SE4.4.2-10, for a listing of specific mitigative actions associated with the expected impacts on land use resulting from Fermi 3 operation. As indicated in ER Subsection 5.1.1.1, Land Use Planning and Zoning, no mitigation measures are required to maintain the expected minor impacts on land use planning and zoning. Therefore, any permit from the USACE would not require special conditions to protect the land use of the surrounding area from operational activities.

4.15.4 References

- 4.15-1 Monroe County Planning Commission, Future Land Use Map from the "Draft Monroe County Comprehensive Plan," http://www.co.monroe.mi.us/government/departments_offices/planning_department_and_commission/monroe_county_comprehensive_plan.html, accessed 9 September 2009.

4.16 Food and Fiber Production

The following subsections assess the expected impact of Fermi 3 construction and operational activities on food and fiber production, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on the food and fiber production on the Fermi site and vicinity.

4.16.1 Direct and Secondary Impacts

Refer to ER Chapter 4, Environmental Impacts of Construction and Chapter 5, Environmental Impacts of Operation, respectively, for an assessment of the expected environmental impacts associated with construction and operation of Fermi 3 on food and fiber production in the surrounding region.

4.16.2 Construction Impacts

Refer to ER Table 4.6-1, Summary of Measures and Controls to Limit Adverse Impacts During Construction, for a summary of the expected environmental impacts associated with Fermi 3 construction. The following subsections discuss the expected impacts on food and fiber production associated from the construction of Fermi 3.

4.16.2.1 Impacts to Agriculture on the Fermi Site and Within Its Vicinity

4.16.2.1.1 Farmland on the Fermi Site

Refer to ER Subsections 4.1.1.2.2, Agricultural and Soil Issues, as revised by NRC RAI GE3.1-1, NRC RAI HY4.2.1-9, and NRC RAI LU4.1.1-1, and 4.3.1.1.1, Vegetation on the Site and in the Vicinity, as revised by NRC RAI GE3.1-1, for a discussion of the construction impacts on prime farmland located on the Fermi site. There is a row crop area of approximately 70 ac., portions of which are prime farmland, in the west-southwest portion of the Fermi site, as depicted on ER Figure 2.4-5, Terrestrial Habitats and Developed Areas at the Fermi Site. The majority of this agricultural area (about 60 ac.) would be used as a surface to store construction materials during the duration of construction for Fermi 3 (approximately five years); the other approximately 10-ac. portion of the agricultural area closest to Fermi Drive will be the site of the Fermi 3 switchyard. Since most of the prime farmland in the agricultural field is located toward the southwestern portion of the field, the use of the prime farmland will be largely temporary and the majority would be restored to agricultural use after Fermi 3 construction ends. Therefore, irreversible conversion of unique agricultural lands onsite by Fermi 3 construction would be minimal.

4.16.2.1.2 Farmland Within the Vicinity of the Fermi Site

ER Subsection 4.3.1.1.1, Vegetation on the Site and in the Vicinity, as revised by NRC RAI GE3.1-1, states that 23,465 ac. of farmland are present in the vicinity of the Fermi site. No impacts on the land use of agricultural areas within the vicinity of the Fermi site are expected.

Refer to ER Subsection 4.1.1.2.2, Agricultural and Soil Issues, for a discussion of impacts to agricultural land anticipated to occur from construction in the transmission corridors. ER Subsection 4.1.2.4, Corridor Restoration and Management Actions and ER Table 4.6-1, Summary of Measures and Control to Limit Adverse Impacts During Construction, discuss measures to reduce transmission corridor construction impacts.

4.16.2.2 Impacts to Aquatic Food and Fiber Production

The Fermi 3 ER assessed the potential impacts from Fermi 3 construction to commercial and recreational fisheries in Lake Erie and subsistence fishing. Refer to ER Subsection 4.3.2.4.2, Commercial and Recreational Aquatic Species, for information concerning the projected impacts on commercial and recreational fishing in the vicinity of the Fermi site. Potential impacts from construction activities to commercial and recreational species are expected to be minimal because of the limited presence of these species within the site. However, incidental impacts related to accidental spills of construction related materials may occur that could interrupt fish migration and spawning and cause fish mortality. The implementation of BMPs and spill prevention measures, detailed in the SPCC Plan, during Fermi 3 construction will limit these accidental spills. Therefore, potential impacts related to accidental spills are expected to be minor and short term.

Additionally, construction activities associated with Fermi 3 could increase turbidity and contaminants from construction effluents that can inhibit fish migratory behavior. However, with the implementation of the appropriate measures of the SESC permit, potential impacts related to construction effluents are expected to be minor and short term.

Refer to the response to NRC RAI HY4.6-1 for additional information associated with the SESC Plan expected to be implemented during Fermi 3 construction.

As indicated in ER Subsection 4.4.3.3, Isolated Population Impacts, no isolated populations engaged in subsistence activities are known to exist on or near the Fermi site. Therefore, there are no expected impacts on such populations related to the construction of Fermi 3.

4.16.3 Operational Impacts

Refer to ER Table 5.10-1, Summary of Measures and Controls to Limit Adverse Impacts During Operation, for a summary of the expected environmental impacts associated with Fermi 3 operation. The following subsections discuss the expected impacts on food and fiber production associated with the operation of Fermi 3.

4.16.3.1 Impacts to Surrounding Agricultural Areas

Refer to ER Subsections 5.1.1, The Site and Vicinity and 5.1.1.2, Soil and Agriculture, for an assessment of the expected operational impact of Fermi 3 on the prime farmland located on the Fermi site. ER Figure 2.1-4, Fermi 3 Site Plan, indicates that the rectangular parcel in the west-southwest corner of the site is proposed to be used for temporary construction laydown and the permanent location of the Fermi 3 switchyard. During Fermi 3 operation, it is expected that the majority of this parcel of land would be returned to agricultural use and therefore would not be affected by plant operation. Furthermore, as indicated in ER Figure 2.2-4, Land Use within the 50-Mile Region, the majority of land surrounding the Fermi site is agricultural. As indicated in ER

Subsection 4.1.1.2.1, Local Monroe County and Frenchtown Township Land Use, the construction of Fermi 3 is not likely to cause a change in land use patterns in the region surrounding the Fermi site. Therefore, no significant impacts are expected from the operation of Fermi 3 on the food and fiber production of the Fermi site and surrounding region.

Refer to ER Subsection 5.1.1.3, Cooling Tower Impact on Land Use, as revised by NRC RAI GE3.1-1, for information related to the potential impacts of the operation of the Fermi 3 cooling towers and the closed-cycle cooling system. The drift associated with operation of the NDCT will result in salt deposition on agricultural farmland surrounding the Fermi site. As ER Subsection 5.1.1.3 indicates, the maximum concentration of salt deposition is expected to occur over Lake Erie and is also at a concentration far lower than generally considered harmful to plants and agricultural crops, such as corn and soybeans. Therefore, the potential impacts from operation of the Fermi 3 cooling towers are not expected to be significant.

4.16.3.2 Impacts to Aquatic Food and Fiber Production

Refer to ER Subsection 5.1.1.4, Spills, for information related to the potential impacts of chemical spills into aquatic areas during the operation of Fermi 3. In accordance with the referenced ER subsection, environmental training will be provided to plant staff to increase their awareness of potential effects of spills on the environment. Additionally, BMPs and spill prevention measures, as outlined in the SPCC Plan, would be implemented during Fermi 3 operation. With these preventive measures in place, the potential impacts of chemical spills on Lake Erie's recreational and commercial fishing, associated with operation of Fermi 3, are expected to be insignificant.

Refer to ER Subsection 5.3.1.2.3.1, Important Species, for information related to the potential impacts of operation of Fermi 3 cooling systems on commercial and recreational fisheries in Lake Erie. As stated in ER Subsection 5.3.1.2.3.1, the potential impacts related to the operation of the Fermi 3 intake structure and cooling water systems are impingement and entrainment. Refer to ER Subsection 5.3.1.2.2, Measures and Controls that Limit Adverse Impacts, for a discussion of actions that may limit the entrapment, impingement, and entrainment of commercial and recreational fish during the operation of the Fermi 3 intake structure and cooling system. Refer also to the response to NRC RAI AE5.2.2-1 for a description of the design and operation of the fish screening system at the Fermi 2 intake and for the proposed Fermi 3 intake.

In addition, refer to ER Subsection 5.3.1.2.4, Previous Studies Applicable to Fermi 3 Cooling System Impacts, for a summary of the fish impingement and entrainment studies performed for other power producing facilities on the western end of Lake Erie. In summary, the potential impacts for the operation of the Fermi 3 intake structure on commercial and recreational fish species are not expected to be significant.

Refer to ER Subsections 5.3.2.2.1, Thermal Impacts and 5.3.2.2.2, Chemical Impacts, for an assessment of the potential thermal and chemical impacts on commercial and recreational fish species from the discharge of Fermi 3 operational cooling water into Lake Erie. As indicated in ER Subsections 5.3.2.2.1 and 2.1.2.1.3, as well as Subsection 2.1.2.1.4 of the USACE Report, no significant thermal or chemical impacts on commercial and recreational fish species are projected to occur.

4.16.4 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on food and fiber production.

4.16.4.1 Cumulative Impacts of Construction

Refer to ER Section 4.7, Cumulative Impacts of Construction, as revised by NRC RAI GE3.1-1, for a discussion of cumulative impacts on food and fiber production associated with the construction of Fermi 3.

4.16.4.1.1 Cumulative Impacts of Construction on Agricultural Areas

Refer to ER Subsection 4.7.1, Land Use, as revised by NRC RAI GE3.1-1, for an assessment of the expected cumulative impacts on agricultural production in the vicinity during Fermi 3 construction. The revised ER Subsection 4.7.1 states that the construction of Fermi 3 is not likely to encourage offsite industrial development on a scale similar to the facility, in part due to county and township zoning, which favors preservation of agricultural and rural land use. Because agricultural land use is dominant near the Fermi site, and no other federal or major construction projects are known to occur during the same time period as Fermi 3 construction, the cumulative impacts on food and fiber production from agricultural farmland are expected to be minor and short term.

4.16.4.1.2 Cumulative Impacts of Construction on Aquatic Food and Fiber Production

Refer to ER Subsection 4.7.4.2, Aquatic Ecology, for a discussion of the expected cumulative impacts on commercial and recreational fish species resulting from the construction of Fermi 3. As indicated in ER Subsection 4.7.4.2, there are no known similar-scale projects for which construction will be started or scheduled within the time frame of Fermi 3 in the area immediately surrounding the Fermi site. Additionally, historic and recent surveys indicate that the fish community of Lake Erie near the Fermi site did not change because of the construction of Fermi 2, and a similar result is anticipated for Fermi 3 construction. Therefore, the cumulative impacts for construction of Fermi 3 on Lake Erie food and fiber production are expected to be minor and short term.

4.16.4.2 Cumulative Impacts of Operation

Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, as revised by NRC RAI GE3.1-1, for a discussion of cumulative impacts on food and fiber production associated with the operation of Fermi 3. As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation are not expected to be cumulatively significant relative to impacts of the operation of Fermi 2. There are no other existing or planned projects of a similar scale to Fermi 3 in the vicinity that would result in increased negative cumulative impacts on the identified resource areas.

4.16.4.2.1 Cumulative Impacts of Operation on Agricultural Areas

Refer to ER Subsection 5.11.1, Land Use, for a description of the cumulative impacts on agricultural land use from the operation of Fermi 3. Fermi 3 is not likely to encourage offsite industrial or urban development on a scale similar to Fermi 2, in part because of county and township zoning, which favors preservation of agricultural and rural land use. In addition, no other large-scale industrial or commercial projects are planned to operate near the Fermi site. Therefore, the cumulative impacts from Fermi 3 operation are expected to be insignificant.

The operation of Fermi 3 cooling towers will result in increased salt deposition to surrounding agricultural lands and vegetation in the vicinity of the Fermi site. However, as indicated in ER Subsection 5.11.2, Air Quality, the salt deposition is expected to be minor because the highest concentrations of salt deposition would be over Lake Erie. Therefore, the cumulative impacts on agricultural land associated with the operation of the Fermi 3 cooling towers are expected to be insignificant.

4.16.4.2.2 Cumulative Impacts of Operation on Aquatic Food and Fiber Production

Refer to ER Subsection 5.11.4.2, Aquatic Ecology, for an assessment of the expected cumulative impacts on commercial and recreational fish species in Lake Erie from Fermi 3 operations. ER Subsection 5.11.4.2 evaluates the cumulative impacts associated with the impingement and entrainment of fish from operation of the intake structure, as well as the thermal and chemical effluents to Lake Erie from operation of the discharge structure. Refer to the response to NRC RAI AE2.4.2-2 for the Aquatic Ecology Survey. The Aquatic Ecology Survey provides Fermi site-specific aquatic ecology information and evaluates impingement mortality associated with the intake structure. Refer also to the response to NRC RAI AE5.2.2-1 for a description of the design and operation of the fish screening system at the Fermi 2 intake and for the proposed Fermi 3 intake.

In summary, as indicated in ER Subsection 5.11.4.2, the cumulative impacts associated with Fermi 3 operations on the food and fiber production of Lake Erie are expected to be insignificant.

4.16.5 Mitigation and Monitoring

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 construction and the mitigation measures that may reduce those impacts.

Refer to ER Table 10.1-2, Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 operation and the mitigation measures that may reduce those impacts.

Refer to ER Chapter 6, Environmental Measurements and Monitoring Programs, for detailed information concerning monitoring to occur on the Fermi site during the following periods:

- Pre-application.
- Site preparation, construction, and pre-operation.
- Operation.

Specifically, refer to ER Section 6.1, Thermal Monitoring, for monitoring of the cooling tower discharge to Lake Erie; ER Subsection 6.5.2, Aquatic Ecology, for information on the monitoring activities to prevent spills of construction materials into the aquatic areas, as well as to describe the monitoring of fish impingement and entrainment from the Fermi 3 intake structure; and ER Section 6.6, Chemical Monitoring, for information on monitoring of the chemical effluents from the Fermi 3 cooling system discharge to prevent adverse impacts on commercial and recreational fish species.

As indicated in ER Section 6.5, Ecological Monitoring, the applicant anticipates consulting with the USACE during the planning of site activities. It is anticipated that any permit from the USACE will reflect the results of those consultations.

4.17 Mineral Needs

The following subsections assess the expected impact of Fermi 3 construction and operational activities on mineral production on the Fermi site and in its vicinity. The subsections will also assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts.

4.17.1 Direct and Secondary Impacts

The impacts associated with the construction and operation of Fermi 3 on mineral production are covered respectively in ER Chapter 4, Environmental Impacts of Construction and Chapter 5 Environmental Impacts of Operation.

4.17.1.1 Construction Impacts

It is expected that project construction will not result in direct impacts on mineral resources at the project site, due to the lack of mineral resources in the area. ER Subsection 10.2.1.1, Land Use Productivity, as revised by NRC RAI GE3.1-1, describes the potential indirect impacts on mineral resources by stating that there will be an irreversible commitment of land because the land cannot be used for other purposes, including mineral production. However, this impact is not expected to be significant to the mineral needs of the public. It is expected that project construction will not result in any direct impacts on mineral resources at the project site, due to the lack of mineral resources in the area.

Regarding construction-related offsite impacts, ER Subsection 10.2.2.1, Construction Materials, as revised by NRC RAI GE3.1-1, states that construction of Fermi 3 will also involve an irretrievable commitment of offsite material resources such as concrete, rebar, cable, and piping. However, the commitment of these construction materials and associated minerals is small and insignificant given the overall availability of these materials.

Refer to the following NRC RAI responses for additional information regarding the commitment of offsite materials:

- NRC RAI TR4.8.3-1 – Provides a listing of major types and quantities of construction materials required to construct the proposed 1600 MWe reactor.
- NRC RAI SE4.4.2-6 – Provides additional information regarding acquisition of materials.

4.17.1.2 Operational Impacts

Project land would be unavailable for mineral production due to the presence of permanent structures after construction of Fermi 3. However, the mineral resources onsite are a small fraction of resources available in the project vicinity. In addition, ER Subsection 2.3.1, Hydrology, states that the onsite Quarry Lakes are not required to support the operation of Fermi 3. Considering these factors, neither the construction nor the operation of Fermi 3 are expected to affect mineral usage rights in areas not directly owned by Detroit Edison.

4.17.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on mineral resources at the Fermi site and in its vicinity.

4.17.2.1 Cumulative Impacts of Construction

ER Section 4.7, Cumulative Impacts of Construction, states that the only other major construction project in Monroe County is the installation of scrubbers at the Monroe Power Plant. Subsection 4.7 goes on to demonstrate that any environmental impacts from the installation of scrubbers at the Monroe Power Plant should be contained within the site, therefore the only cumulative impacts of construction at the Fermi site are from the construction of Fermi 3 itself. ER Subsection 4.1.1.2.2, Agriculture and Soil Issues, as revised by NRC RAI GE3.1-1, NRC RAI HY4.2.1-9, and NRC RAI LU4.1.1-1, states that construction will take about five years at the Fermi 3 site. However, because

much of the land used for Fermi 3 construction is expected to be returned as native habitat after construction is finished, the cumulative effects from construction of Fermi 3 should be limited to small minor short-term impacts on mineral resources at the site.

4.17.2.2 Cumulative Impacts of Operation

As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation are not expected to be cumulatively significant relative to impacts of the operation of Fermi 2. There are no other existing or planned projects of a similar scale to Fermi 3 in the vicinity that would result in increased negative cumulative impacts on the identified resource areas. Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, for additional information regarding the expected cumulative impacts associated with the operation of Fermi 3.

4.17.3 Mitigation and Monitoring

Due to the lack of current or expected public use of mineral resources in the area, mitigation and monitoring to protect the mineral needs of the public is not expected to be necessary for the construction or operation of the Fermi 3 facility.

As stated in ER Subsection 2.2.1.1, The Site, as revised by NRC RAI GE3.1-1, there is no exploration, drilling, or mineral extraction of any kind on or adjacent to the Fermi site. The geology of the subsurface structure in the area and current land use indicate that commercial mineral production is unlikely at any time in the foreseeable future. There are no known mineral resources located within or adjacent to the Fermi site, nor are such resources expected to be found or developed in the near future.

4.18 Water Quality

The following subsections assess the proposed project's impact on water quality during construction and operation of Fermi 3, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify any cumulative impacts.

4.18.1 Direct and Secondary Impacts

The ER addresses probable impacts in terms of construction-related actions and long-term operations. The ER addresses both sediment and chemical-related impacts on water quality. No major or permanent degradation of water quality is expected from the proposed construction and long-term operations. There are no water intakes in the area that are likely to be affected and no anticipated impacts on any drinking water aquifer.

The project is not expected to limit the availability of water to satisfy potential water needs of other users. Likewise, the project is not expected to cause any violations of state and federal water quality standards or contribute to any significant adverse effects on aquatic life or ecosystem diversity, productivity, or stability.

4.18.1.1 Construction Impacts

Refer to ER Subsection 4.2.2, Water-Use Impacts, for a summary of water use impacts on water quality and other users during construction. As indicated in ER Subsection 4.2.1.2, Construction Activities, as revised by NRC RAI GE3.1-1, the following construction activities could result in impacts on the hydrology of the Fermi site:

- Clearing additional land at the project site and constructing infrastructure such as roads and stormwater drainage systems.

- Construction of new buildings (reactor containment structures, turbine building, cooling tower, electrical substation, and other related structures).
- Construction of additional parking lots and roads that will support the construction and operation of Fermi 3.
- Construction of both the station water intake structure for water withdrawn from Lake Erie and the discharge pipe for water discharged to Lake Erie.
- Construction of docking facilities for barges/vessels that will be used to bring in some materials and machines.
- Temporary disturbance of existing vegetated areas to establish construction lay-down areas, concrete batch plants, sand/soil/gravel stockpiles, and construction worker parking areas.
- Backfilling of onsite water bodies with excavation materials or materials brought in from offsite.
- Dewatering of foundation excavations during construction.
- Installation of underground piping such as sanitary, stormwater, and fire protection piping.
- Installation of underground piping to the cooling tower, the discharge piping from the cooling tower to the intake groins area, and makeup water piping from the intake to the circulating water system.

4.18.1.1.1 Water Quality Impacts Associated with Dredging Activities

As noted above, limited dredging activities will occur during the construction of Fermi 3. Specifically, dredging will occur during the installation of the Fermi 3 discharge pipe. As stated in the NRC RAI responses to HY4.2.1-7 and HY4.2.1-8, at this time the only expected dredging associated with the construction of Fermi 3 is in conjunction with the installation of the Fermi 3 discharge pipe. A determination regarding the extent of required dredging activities will be clarified during the development of the Joint Permit Application. The Joint Permit Application will be submitted to the MDEQ and USACE to request authorization for several activities, including dredging within Lake Erie.

Limited physical disturbance is expected to occur along the lake bottom from dredging activities. Dredging activities will cause re-suspension of sediments at the point of disturbance. Refer to ER Subsection 4.7.4.2, Aquatic Ecology, for an assessment of the impact of dredging activities.

As stated in ER Subsection 4.2.1.4, Water Bodies Receiving Construction Effluents, water and dredged material removed prior to construction of the Fermi 3 discharge pipe are expected to be diverted to the dredged spoils disposal basin. The dredged material removed as a result of Fermi 3 construction activities may be transported either by barge or a slurry pipeline. Refer to the NRC RAI HY4.2.1-7 response for additional information regarding the removal of dredged material associated with the construction of Fermi 3. Sediments may be released to the surrounding water bodies (1) during dredging, (2) along the route to offloading, and (3) at the offloading point. The release of sediments is expected to be minimized by the implementation of BMPs contained within the SESC Plan.

Dredged materials transported by slurry pipeline may be transported to the existing dredged spoils disposal pond. The overflow system at the dredged spoils disposal pond is designed to remove suspended materials so that effluent to Lake Erie does not exceed background levels for suspended materials. The dredging would cause minor short-term degradation of water quality; however, due to the nature of the sediments, turbidity should return to ambient levels following completion of each dredging activity.

Refer to RAI Responses HY4.2.1-7 and HY4.2.1-8 for more information about dredging activities.

As indicated in ER Subsection 4.2.1.4, Water Bodies Receiving Construction Effluents, due to the sedimentation capacity of the dredged material spoils basin, discharges resulting from construction will have minor, short-term impacts on Lake Erie, and no mitigative measures are needed.

4.18.1.1.2 Compliance with Effluent Limitations and Water Quality Standards

As indicated in ER Subsection 4.2.1, Hydrologic Alterations, construction activities associated with Fermi 3 will comply with applicable effluent limitations and water quality standards. Refer to ER Subsection 1.2.1, Permitting Actions under the Federal Water Pollution Control Act Sections 401 and 402, for information regarding Detroit Edison's intent to obtain the necessary CWA Section 401 water quality certification and the CWA Section 402 authorizations as part of the Fermi 3 approval process.

4.18.1.2 Operational Impacts

ER Figure 3.3-1, Water Use Diagram, provides for a detailed water use diagram and water balance for Fermi 3 operations. Example information provided includes the following maximum normal power operation values:

- Total makeup water intake - 34,264 gpm.
- Total discharge - 17,215 gpm.
- Total discharge to the Monroe County sewer system - 253 gpm.

4.18.1.2.1 Impact of Operational Land Use on Water Quality

The proposed operation of Fermi 3 would result in the alteration of land use on the Fermi site. Portions of the site that currently filter rainfall and runoff that would otherwise directly enter Lake Erie would be replaced with a new source area for runoff pollutants. Potential pollutants from these new areas may vary depending upon the new land use. Although the onsite land use will be modified, limited impacts on water quality from runoff pollutants are expected because of the implementation of BMPs contained within the SWPPP. ER Subsection 5.2.1.6, Operational Activities Causing Other Hydrologic Alterations, contains additional information regarding SWPPP implementation.

The operation of Fermi 3 is not expected to require new dredging or excavation activities. Periodic maintenance dredging activities currently performed by Detroit Edison under an existing USACE permit would benefit Fermi 3 operations. The responses to NRC RAIs HY4.2.1-7 and HY4.2.1-8 and ER Subsection 5.2.1.6, Operational Activities Causing Other Hydrologic Alterations, include additional information regarding dredging activities associated with Fermi 3.

The proposed activities associated with Fermi 3 are not expected to result in increased boater use during Fermi 3 operation. Refer to Section 4.7 of the USACE Report for additional information regarding navigation and boating activities associated with the Fermi 3 project.

As noted in ER Subsection 5.5.1.1.1, Sanitary Waste, all sanitary waste from Fermi 3 is expected to be collected onsite and pumped to the Frenchtown Charter Township Sewage Treatment Facility for treatment in accordance with the Frenchtown treatment and discharge program under an NPDES permit and federal sanitary waste treatment limits (40 CFR 133 limits).

The proposed activities are not expected to have an adverse impact on groundwater quality, as described in ER Subsection 5.11.3.4, Groundwater Quality.

4.18.1.2.2 Impact of Operational Discharges on Water Quality

Refer to ER Subsection 5.2.2.2, Potential Water-Use Impacts, for details on water use and water quality impacts associated with Fermi 3 operations, including chemical impacts, solids/sediment impacts, thermal impacts, operational limitations, discharge design, and regulatory compliance. Refer also to the response to NRC RAI HY5.3.2-4, for additional information regarding the choice to use a single-port CORMIX 1 model to model the thermal plume to evaluate the effects of rare westward currents, while a multiple port CORMIX 2 model was used for other thermal plume modeling.

Refer to ER Subsection 5.3.2.1, Thermal Description and Physical Impacts, for details about potential thermal impacts on water quality, including results of the thermal plume analysis.

Refer to ER Figure 5.3-8, Fermi 3 Maximum Predicted Worst-Case Thermal Plume, for a graphic depiction of the largest thermal plume modeled for Fermi 3.

ER Subsection 5.3.2.2.2, Chemical Impacts, provides details about chemical impacts on water quality. As stated in ER Subsection 5.3.2.2.2, Fermi 2 has maintained consistent compliance with NPDES effluent limits, and the relevant regulatory parties have been satisfied that Fermi operations have been consistent with the relevant rules and the protection of water quality of both Swan Creek and Lake Erie. Similarly, operational discharges would be maintained in compliance with the Clean Water Act Section 307 toxic effluent standards or bans. Therefore, it is expected that Fermi 3 will result in compliance activities similar to Fermi 2. If there are any impacts on water quality from Fermi 3 operations, those impacts are expected to be minor.

4.18.2 Cumulative Impacts

Separate sections of the Fermi 3 ER address the cumulative impacts of Fermi 3 construction and operation. The construction and operations sections of the ER indicate that, if there are any cumulative impacts on water quality from Fermi 3, those impacts are expected to be minor.

Reference to the specific ER sections associated with cumulative construction and operation impacts is presented in the following subsections.

4.18.2.1 Cumulative Impacts of Construction

Refer to ER Subsections 4.7.3, Hydrology, Water Use, and Water Quality; 4.7.3.2, Surface Water Quality; and 4.7.3.4, Groundwater Quality, for summaries of the cumulative impacts of Fermi 3 construction on surface water quality and groundwater quality. ER Subsection 4.7.4.1, Terrestrial Ecology, as revised by NRC RAI GE3.1-1, summarizes the cumulative impacts of Fermi 3 construction on terrestrial ecology (including wetlands), and ER Subsection 4.7.4.2, Aquatic Ecology, summarizes the cumulative impacts on aquatic ecology, including impacts of dredging.

Overall, the proposed construction activities are expected to have a negligible impact on water quality in the proximate areas of Lake Erie and local streams. There is no readily apparent, lower impact, and practicable alternative to the proposed construction activities and the project is not expected to cause or contribute to significant adverse effects on water quality.

4.18.2.2 Cumulative Impacts of Operation

Refer to ER Subsection 5.11.3, Water Use and Quality, for a summary of the cumulative impacts of Fermi 3 operation on water use and quality, including surface water quality and groundwater quality.

Refer to ER Subsection 5.11.7, Radiological Impacts of Normal Operation, regarding cumulative radiological impacts of normal operation, including a cumulative impact evaluation for water quality. Refer to ER Section 5.4.1.1, Liquid Pathways, for radiological exposure models for liquid discharges to Lake Erie. Refer to the response to NRC RAI HY2.3.1-15 for a history of any radwaste/wastewater discharges (to any location) from Fermi 2.

4.18.2.3 Mitigation and Monitoring

Mitigation to protect water quality beyond the use of an SWPPP and an SESC Plan is not needed or planned.

The following ER section, subsections, and table address water quality monitoring:

- Subsection 6.2.3, Conclusion and Table 6.2-1, Fermi 2 Radiological Environmental Monitoring Program Locations, for a description of the existing radiological monitoring related to water quality. The future Fermi 3 REMP is expected to be similar to the existing Fermi 2 program.
- Subsection 6.3.2, Construction Monitoring, for a description of monitoring related to dewatering during Fermi 3 construction.
- Section 6.6, Chemical Monitoring, for a description of water quality monitoring related to chemical impacts, including expected chemicals in Fermi 3 wastewater discharges.

4.19 Consideration of Property Ownership

The following subsections assess the expected impacts of Fermi 3 regarding property ownership considerations during its construction and operation, assess the potential need for mitigation or monitoring to protect this public interest factor, and identify cumulative impacts on property ownership.

4.19.1 Direct and Secondary Impacts

The following subsections address the expected impacts of Fermi 3 construction and operational activities on property ownership considerations.

4.19.1.1 Construction Impacts

The following subsections assess the expected impacts on property ownership considerations as a result of Fermi 3 construction activities.

4.19.1.1.1 Property Ownership

As indicated in ER Subsections 1.1.1, Ownership and Applicant and 2.2.1.1, The Site and associated tables and figures, Detroit Edison is the licensed owner and operator of the Fermi site. Detroit Edison possesses the required interests in the Fermi site for construction of Fermi 3. The construction of Fermi 3 is a reasonable private use of the Fermi site and is consistent with the site's current use for power generation. Therefore, the construction of Fermi 3 is not expected to adversely affect ownership.

As indicated in ER Subsection 2.2.2, Transmission Corridors and Offsite Areas, the offsite transmission line is, and will remain, under ITC Transmission ownership. The transmission corridor is zoned for the conveyance of electrical energy, which is consistent with the intended use. Therefore, construction of the transmission lines associated with Fermi 3 is not expected to adversely affect ownership.

4.19.1.1.2 Onsite Structures to Prevent Soil Erosion

Refer to Subsection 4.12.2.1 of the USACE Report and the referenced sections of the ER for information concerning structures and BMPs to be used onsite during construction to prevent soil erosion. Identified BMPs would be implemented to minimize the potential impacts associated with hydrologic alterations or effluent discharges, as stated in ER Subsection 4.2.1.9, Hydrologic Alteration Best Management Practices and Measures. BMP implementation is not expected to damage other property, adversely affect floodplain or wetland values, or otherwise be contrary to the public interest.

4.19.1.1.3 Navigability of Area Waters

Refer to Subsection 4.7.2.1 of the USACE Report and the referenced sections of the ER for an assessment of the expected impacts on navigable waters caused by the construction of Fermi 3. In summary, Fermi 3 construction activities will include the periodic delivery of equipment and materials via barge to a new onsite barge facility.

4.19.1.1.4 Presence of Federal Projects within the Area

Refer to ER Section 2.8, Related Federal Project Activities, for a discussion of the federal projects directly related to Fermi 3 that would affect land acquisitions or use, plant siting and water supply, construction or operation of Fermi 3, or the need for power.

As indicated in ER Section 2.8, Related Federal Project Activities, no federal project activities were identified that would be directly related to plant siting and water supply, construction, transmission or the need for power. ER Section 2.8 does indicate that lands operated as part of the DRIWR must be removed from the Detroit Edison and USFWS Cooperative Agreement before commencing construction. The Cooperative Agreement allows either party to end the agreement. Therefore, based on the review completed during the development of ER Section 2.8, Fermi 3 construction is not expected to interfere or be incompatible with an authorized or existing federal project. The NRC RAI LU1.2-1a response provides a copy of the agreement between the USFWS and Detroit Edison regarding the DRIWR.

4.19.1.2 Operational Impacts

The following subsections assess the impacts on property ownership considerations resulting from the operational activities associated with Fermi 3.

4.19.1.2.1 Property Ownership

As indicated in ER Subsections 1.1.1, Ownership and Applicant and 2.2.1.1, The Site and associated tables and figures, Detroit Edison is the licensed owner and operator of the Fermi site. Detroit Edison currently possesses the required Fermi site property interest needed to operate Fermi 3. The operation of Fermi 3 is a reasonable private use of the Fermi site and is consistent with its current use for power generation. Therefore, the operation of Fermi 3 is not expected to adversely affect property ownership.

As indicated in ER Subsection 2.2.2, Transmission Corridors and Offsite Areas, the offsite transmission line is, and will remain, under ITC Transmission ownership. The transmission corridor is zoned for the conveyance of electrical energy, which is consistent with the intended use. Therefore, operation of the transmission lines associated with Fermi 3 is not expected to adversely affect ownership.

4.19.1.2.2 Onsite Structures to Prevent Soil Erosion

Refer to Subsection 4.12.2.2 of the USACE Report and the referenced sections of the ER for an assessment of soil erosion impacts associated with Fermi 3 operational structures and management practices. As indicated in the above referenced subsections, Fermi 3 operation would involve few activities resulting in the placement of new erosion control structures, alteration of existing onsite structures, or implementation of soil erosion management practices. As a result, the onsite soil erosion prevention structures are expected to have impacts similar to those currently experienced during the operation of Fermi 2.

4.19.1.2.3 Navigability of Area Waters

Refer to Subsection 4.7.2.2 of the USACE Report and the referenced sections of the ER for an assessment of the expected impacts on navigable waters caused by Fermi 3 operation. In summary, the Fermi 3 operational activities involving the use of navigable water are likely to be similar to those for Fermi 2. Therefore, Fermi 3 operation is not expected to affect the navigability of area waters or unduly interfere with access to or utilization of navigable waters.

4.19.1.2.4 Presence of Federal Projects within the Area

Refer to ER Section 2.8, Related Federal Project Activities, for a discussion of the federal projects directly related to the Fermi 3 project that could affect land acquisitions or use, plant siting and water supply, construction or operation of Fermi 3, or the need for power.

As indicated in ER Section 2.8, Related Federal Project Activities, no federal project activities were identified that would be directly related to plant siting and water supply, construction, or the need for power. ER Section 2.8 does indicate that lands operated as part of the DRIWR must be removed from the Detroit Edison and USFWS Cooperative Agreement before commencing construction. The Cooperative Agreement allows either party to end the agreement. Therefore, based upon the review completed during the development of ER Section 2.8, Fermi 3 operation is not expected to interfere or be incompatible with an authorized or existing federal project.

4.19.2 Cumulative Impacts

The following subsections identify the expected cumulative impacts of the construction and operation of Fermi 3 on property ownership considerations.

4.19.2.1 Cumulative Impacts of Construction

Refer to ER Section 4.7, Cumulative Impacts of Construction, for an assessment of the expected cumulative impacts associated with Fermi 3 construction. As indicated in ER Subsection 4.7.8, Conclusion, the cumulative impacts resulting from construction or from planned mitigation/avoidance are minor, short term, and negative.

4.19.2.2 Cumulative Impacts of Operation

As stated in ER Subsection 5.11.9, Conclusion, the impacts from Fermi 3 operation are not expected to be cumulatively significant relative to the impacts of Fermi 2 operation. The ER did not identify any other existing or planned projects of a similar scale to Fermi 3 in the project's vicinity that would result in increased negative cumulative impacts on the identified resource areas. Refer to ER Section 5.11, Cumulative Impacts Related to Station Operation, for additional information regarding the expected cumulative impacts associated with Fermi 3 operation.

4.19.3 Mitigation and Monitoring

Refer to ER Table 10.1-1, Unavoidable Adverse Environmental Impacts of Construction and Table 10.1-2 Unavoidable Adverse Environmental Impacts of Operation, as revised by NRC RAI GE3.1-1 and NRC RAI SE4.4.2-10, for a summary of the anticipated impacts of Fermi 3 development and the mitigation measures that may reduce those impacts. Based on the above impact analysis, any permit from the USACE would not require special conditions to protect the property ownership considerations public interest factor.

Chapter 5 Conclusion

The USACE Report concludes that the construction of Fermi 3 at the Fermi site meets the purpose and need of Detroit Edison, while complying with the CWA Section 404(b)(1) guidelines and demonstrating compatibility with the public interest. As indicated in Table 5-1, CWA 404(b)(1) Compliance Summary, the project complies with CWA Section 404(b)(1) Guidelines because:

- There are no other practicable alternatives to the proposal that would have fewer adverse impacts on the aquatic environment which would not have other significant adverse environmental consequences.
- The discharge to waters of the United States would not adversely affect water quality, violate state water quality or toxic effluent standards, or jeopardize the continued existence of a threatened or endangered species, as identified under the ESA.
- The discharge would not cause or contribute to the significant degradation of waters of the United States.
- The project would minimize adverse impacts on wetlands and aquatic environments to the extent possible and includes proposed mitigation for unavoidable adverse impacts.

Additionally, it is expected that the proposed project would economically benefit the community through the creation of employment, generation of income, and increased tax benefits. Economic benefits are expected to occur for those performing the work, the workforce, and those selling goods and materials in the local community.

In conclusion, the USACE Report, the ER, and responses to NRC RAIs indicate that the project is the least environmentally damaging practicable alternative and is consistent with the public interest.

Table 5-1 Section 404(b)(1) Compliance Summary Matrix

Compliance Aspect	Meets Criteria	Location of Discussion within the USACE Report
1. The applicant must overcome presumption that a practicable less environmentally damaging alternative site, outside special aquatic site, exists. If the project is water dependent, OR is not in a special aquatic site, enter on N/A (not applicable)	N/A	According to guidance described in the compliance aspect, this item is not applicable, because the project is water dependent. However, the USACE Report demonstrates that there is no less environmentally damaging practicable alternative.
2. There must be no alternative that is practicable, is less damaging to the aquatic ecosystem, and has no other significant adverse environmental effects.	Yes	Chapter 2
3. The discharge must not violate state water quality standards or Clean Water Act Section 307 toxic effluent standards or bans.	Yes	Chapter 2 <ul style="list-style-type: none"> • 4.6.1.2.1.3; • 4.6.1.2.1.4; • 4.18.1.2.2.
4. The project must not jeopardize the continued existence of an endangered species.	Yes	4.2
5. The project must not cause or contribute to significant adverse effects on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites, or other aspects of human health or welfare.	Yes	Chapter 4
6. The project must not cause or contribute to significant adverse effects on life stages of aquatic life and other wildlife dependent on aquatic ecosystem.	Yes	4.6
7. The project must not cause or contribute to significant adverse effects on ecosystem diversity, productivity, or stability.	Yes	4.2, 4.6
8. The project must not cause or contribute to significant adverse effects on recreational, aesthetic, or economic values.	Yes	4.8, 4.4, 4.3
9. All appropriate and practicable steps to minimize potential adverse effects of the discharge on the aquatic ecosystem must be taken.	Yes	Chapter 2

Appendix A: USACE RAIs

Enclosure 2
U.S. Army Corps of Engineers (USACE) Requests for Additional Information (RAIs)
Fermi Nuclear Power Plant, Unit 3 (Fermi 3)
Combined License Application - Environmental Report

RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
<p>USACE-1</p> <p>33 CFR Parts 320-330: Regulatory Programs of the Corps of Engineers¹</p> <p>Detroit District Corps permit evaluation document template²</p> <p>40 CFR Part 230-Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material¹</p>	<p>Provide a review and evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest (public concerns or rights). This review/evaluation should include supportive materials, including drawings, and references. This may be integrated with the Clean Water Act (CWA), Section 404(b)(1) Guidelines alternative analysis (see USACE-2).</p> <p>For public interest or other relevant factors that may also require review by statute (see CFR 320.3), include reference to the statute.</p>	<p>This information is necessary to allow comparison of existing conditions to proposed conditions relative to the public interest that may be affected by the construction, including indirect and cumulative impacts, and operation of the proposed project.</p> <p>A Department of the Army (DA) decision on whether to issue a Section 10 and/or 404 permit(s) is required to reflect the national concern for both protection and use of important resources. This is accomplished through a public interest review and evaluation conducted in accordance with the U.S. Army Corps of Engineers (Corps) General Policies for Evaluating Permit Applications found in 33 Code of Federal Regulations (CFR) Part 320.4. The Detroit District Corps incorporates the required public interest review, National Environmental Policy (NEPA) documentation, and if applicable, the factual and compliance determination according to the CWA Section 404(b)(1) Guideline (Guidelines) in a single permit evaluation document.</p>

¹ Available at: www.usace.army.mil/CECW/Pages/reg_materials.aspx

² Document provided as attachment to Enclosure 2.

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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-1a	<p>For the public interest factors listed in 33 CFR Part 320.4 (a)(1), as well as all other factors which may be relevant to the proposal and the cumulative effects thereof, include specific baseline condition descriptions of the characteristics, including all existing structures and fills located at or waterward of the Ordinary High Water Mark for Lake Erie (bulkhead, riprap, fencing, etc.) within the site boundaries, for each anticipated preconstruction, construction and operation direct, secondary or cumulative impact area attributable to permanent and temporary structures, including the intake pipe and outfall; dredging; and the discharge of dredged/fill material, and other work (exclusionary boundary) proposed in navigable waters of the US or would involve the discharge of dredged/fill in adjacent wetlands.</p>	<p>33 CFR Section 320.3 lists laws related to the Corps permit application evaluation.</p> <p>The public interest factors listed in 33 CFR Part 320.4(a)(1) include: conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish & wildlife values, flood hazard, floodplain values, land use, navigation, recreation, shore erosion and accretion, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people.</p> <p>Specific Corps policy for perspective for certain public interest review factors are included in 33 CFR Parts 320.4 (b) through 320.4 (r).</p>
USACE-1b	<p>Include a discussion of the overall importance, development/loss status, etc, in western Lake Erie, of the most readily identifiable natural feature, as defined by the MDEQ (Michigan Department of Environmental Quality) & Michigan Natural Features Inventory (MNFI), in the context of the water of the US and adjacent wetlands in which these work areas are located.</p>	<p>MDEQ defines the wetlands on site to be affected by the project as Great Lakes coastal wetlands (letter to NRC, dated February 2, 2009). The Michigan Natural Features Inventory more specifically defines the wetlands as a Great Lakes Marsh natural community (http://web4.msue.msu.edu/mnfi/)</p>

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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-1c	For the public interest factors listed in 33 CFR Part 320.4 (a)(1), as well as all other factors which may be relevant to the proposal and the cumulative effects thereof, specify the type and magnitude of the direct, secondary and cumulative impacts attributable to the proposed work in navigable waters of the US and adjacent wetlands from the perspective of Corps policy.	Specific Corps policy for perspective for certain public interest review factors are included in 33 CFR Parts 320.4 (b) through 320.4 (r).
USACE-1d	Specifically relate proposed project activities to the type, location, and degree of unavoidable adjacent wetland and other water-related impacts and expand the discussion to include impacts on the values and functions of the water/wetlands types (regulatory) individually, as well as within the context of the coastal wetland resources of western Lake Erie. Include all aspects of the project including preconstruction, construction and temporary work.	The Corps regulations (33 CFR Part 320.4(b)) recognize that some (but not necessarily all) wetlands perform functions important to the public interest (see 33 CFR Part 320.4(b)(2)). When alteration of wetlands considered to have important functions is proposed, documentation should be as specific as possible about how the functional importance (or lack of functional importance) of the wetland was determined. Statements such as, "this type of wetland is known generically to be important" (or unimportant) are not adequate and need to be augmented with more specific information, including the incremental contribution of the area in question to the whole. Documentation of value and importance should be objective and factual.

Enclosure 2 (Continued)
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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-1e	<p>Include discussion of on-site project modifications to minimize temporary and permanent fill discharges into waters of the US and adjacent wetlands, including how alternate on-site locations, changes in configuration, construction methods, technologies, work scheduling, etc. were considered to minimize damage to waters of the US and adjacent wetlands. Show the method to estimate the environmental consequences of each modification plan, and narrative showing the quantities of fill for the proposed plan is the minimum amount practicable. Conceptually, describe how compensation for unavoidable short term and long term water of the US and adjacent wetland losses will be accomplished, and/or why compensatory mitigation should not be required for all or specific aquatic impacts.</p>	<p>The Guidelines and 33 CFR Part 332 project review progresses through a sequence of avoidance, minimization, and then compensation for project impacts. Compensatory mitigation is required for unavoidable wetland resource losses which remain after minimization. A conceptual mitigation plan is a necessary component of the 404 permit review process. However, a DA 404 permit cannot be authorized on the basis of a conceptual plan; a final mitigation plan must be reviewed and approved prior to DA permit issuance.</p>
USACE-1f	<p>Describe any special practices or conditions proposed to minimize detrimental project effects, what impact would be reduced, the magnitude of the reduction and how the condition or practice would reduce the impact.</p>	<p>Any special practices or conditions proposed to minimize impacts should be limited to those necessary to comply with Federal law (relative to Corps authorities), while affording the appropriate and practicable environmental protection, including offsetting aquatic impacts with compensatory mitigation. The special conditions must be sufficiently justified and substantially related to impact issues raised in the public interest review process or specifically requested/offered by the applicant. 33 CFR Parts 320.1 and 320.2 describe the types of activities regulated by the Corps and authorities to issue permits and Part 320.3 lists laws related to the Corps permit program.</p>

Enclosure 2 (Continued)
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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-1g	<p>Provide figure(s) showing project location, footprint and type of permanent and temporary construction impact in relation to wetland type/other water. These figures should reflect any updates to the proposed project features and work since the ER, if available.</p> <p>Include project description that summarizes the anticipated construction sequence and equipment use, specific types of work and/or structures (including proposed barge channel dredging, barge docking facilities, turbidity containment, intake and pipeline discharge systems and Exclusion Area Boundary), work and structure locations, approximate work and/or structure dimensions, and approximate acreage/square footage and approximate quantities for all dredged/fill discharge areas associated with all preconstruction, construction and temporary activities/features and best management practices, proposed waterward of the Ordinary High Water Mark of Lake Erie and adjacent wetlands. The project description should include 8-1/2" x 11" figures depicting the existing site conditions (including the Exclusion Area Boundary, existing dredging/disposal area, shoreline structures, natural features, etc.) as described in the baseline condition description and proposed site footprint, as described in the project description, in both plan-view and cross-sectional views. Include anticipated dredging/fill areas and structures, temporary work areas, stockpile/disposal site, roads and structures, and Exclusion Area Boundary. These figures should reflect any updates to the proposed project features and work since the Environmental Report, if available.</p>	<p>Discussion at the site audit indicated that there may be changes to the proposed locations of project features and work. Any specific design information or updates not currently available should be included in the application for DA Section 10 and 404 permits.</p>

Enclosure 2 (Continued)
Page 6 of 10

RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-1h	Incorporate consideration of the general criteria listed in 33 CFR Part 320.4(a)(2) in the evaluation.	The public interest review includes consideration of public and private needs, alternatives, and impacts, known as General Criteria, as discussed in 33 CFR Part 320.4 (a)(2). The relative extent of the public and private need for the proposed structure or work; where there are unresolved conflicts as to the use of the resource; whether there are practicable alternate locations and methods to accomplish the objective of the proposed structures and/or work; and the extent and permanence of the beneficial and/or detrimental effects the proposed structure or work is likely to have on the public and private uses to which the area is suited.
USACE-1i	Use following significance levels to describe direct, secondary, and cumulative impacts: short term/long term minimal; short term/long term minor; short term/long term major, in the evaluation, as appropriate.	See Detroit District Corps permit evaluation document template.
USACE-1j	Include all supportive records and drawings, as attachments, used to document the public interest evaluation, including baseline conditions, impacts, and special practices/conditions.	The Public Interest review/evaluation should be a "stand alone" document and include all drawings and supportive documentation. It can be integrated with the Section 404(b)(1) Alternative Analysis (see USACE-2) to avoid duplication.

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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-2	Provide a Section 404 (b)(1) Guidelines Alternative Analysis Package. A suggested list and order of topics to be discussed and presented in the package is provided below. This alternative analysis should include supportive materials, including drawings, and references. This may be integrated with the Public Interest Review/Evaluation (see USACE-1).	<p>The purpose of the Section 404(b)(1) Guidelines alternative analysis package is to demonstrate that the proposed plan satisfies the CWA Section 404(b)(1) Guidelines (40 CFR Part 230), which are the substantive criteria the Corps will use in determining the project's environmental impact on aquatic resources from discharges of dredged or fill material.</p> <p>A DA Section 404 permit is necessary to construct any project involving the discharge of dredged or fill material into waters of the US. The Corps must ensure that the activity complies with the Guidelines as one step in its evaluation process. Among other things, an applicant for a 404 permit must demonstrate to the Corps that the Proposed Project is the least environmentally damaging practicable alternative (LEDPA). The LEDPA is determined by the preparation of a Section 404(b)(1) Guidelines Alternatives Analysis.</p>
USACE-2a 33 CFR Part 332, Compensatory Mitigation for Losses of Aquatic Resources	Project Description/Purpose & Need: Provide narrative that includes project description and clarification of Detroit Edison Company's basic purpose and need for the project. Why is the project proposed? Include narrative information on marketing, location, history, and other factors that influence or constrain the nature, size, price, class, or other characteristic of the project.	<p>Consideration of project purpose is important element of the Guidelines evaluation.</p> <p>Consideration of project need is a requirement of every Corps permit evaluation (33 CFR Part 320.4(a)(2)(i)). The Corps will consider the applicant's stated purpose ("...to generate electricity for sale" but will define the overall purpose. Overall project purpose is the basis for the alternative analysis and determined solely by the Corps. It will be reviewed and redefined, if necessary, since it may change or need to be revised as the result of project review.</p> <p>The overall project purpose includes the public and/or applicant's needs. It does not include</p>

Enclosure 2 (Continued)
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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
		<p>secondary project purposes, site-specific secondary requirements, project amenities, desired size requirements or desired return on investment. Based on the information provided in the ER, the overall project purpose, as determined by the Corps, would reflect a statement such as: Add baseload electric generating capacity to address current and future peak electricity demand in the Detroit Edison Company service area.</p> <p>At this point, it is necessary to consider ways to achieve the overall project purpose which would avoid discharges in wetlands by analyzing all practicable alternatives to the proposed discharge in wetlands. The Guidelines define a practicable alternative as one which "is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purpose." Further guidance is available in 40 CFR Part 230.10(a)(2).</p> <p>The consideration should include use of offsite areas which can be reasonably obtained, utilized, expanded or managed in order to fulfill the overall project purpose. The Corps and US Environmental Protection Agency (USEPA) Memorandum of Agreement (MOA) requires the 404 review of practicable alternatives to progress through a mitigation sequence of avoidance, minimization, and then compensation for project impacts, which is now codified as Corps and USEPA regulations (33 CFR Parts 325 & 332; 40 CFR Part 230, Compensatory Mitigation for Losses of Aquatic Resource; Final Rule, dated April 10, 2008).</p>

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RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-2b	<p><u>Avoidance</u>. Include (1) a set of criteria to determine practicability for alternative site selection; (2) a definition of the geographic limits to search for alternative sites; (3) the cost of creating a complete project at each site; (4) an analysis of impacts of candidate sites on Corps public interest factors, including quantification of aquatic impacts relative to the aquatic site function and values; and (5) a system to rate an alternative site against the criteria items and a method to comparatively weigh each rating; (6) a report describing the search for the sites, their rating, and narrative of the rationale for selecting the proposed plans as the least environmentally damaging practicable alternative. The alternative analysis must clearly and fully show that the proposed site and site plan is the least environmentally damaging or the only practicable alternative; that it <u>must</u> be located on the wetland and that the project <u>could not</u> be changed to a non-wetland location. The report must include the rating and narrative for the proposed Site Plan as well as for the "No Project (use existing facilities)" alternative. If cost is used to show that an alternative is not practicable, then no additional analysis is necessary. If cost is used to show that one option is more expensive than the preferred alternative, then total cost comparison between alternatives should be completed to prove this statement. Included with the cost comparisons are all aspects of project completion. Note that the criteria are predicated on the project's purpose.</p>	<p>Avoidance (Step 1): involves a look at other geographic sites to determine the least environmentally damaging practicable site (LEDPA):</p> <ul style="list-style-type: none"> • Only practicable alternatives to the proposed plan need to be considered in determining the LEDPA. • Upland sites are presumed to be available unless clearly demonstrated otherwise by the applicant. <p>Note that an expansion of the alternatives originally considered in the ER may be necessary for the Guidelines analysis. Compensation cannot be used to reduce impacts to satisfy avoidance.</p> <p>The Corps will seek avoidance first.</p> <p>The 404 alternative analyses will need to continue for each practicable alternative until it is proven that it is not a practicable alternative, or that it has more impacts (quantified) to aquatic resources than the Proposed Plan. If alternative practicability continues, off-site alternatives (away from the Fermi 3 site, which may include a site not owned by the applicant,) will need to be included within the evaluation for the impacts to waters of the U.S.</p>

Enclosure 2 (Continued)
 Page 10 of 10

RAI Number	Question Summary (RAI)	Full Text (Supporting Information)
USACE-2c	<p><u>Minimization</u>. Include (1) alternate site plans; (2) a method to estimate the environmental consequences of each plan; and, (3) a narrative that shows the quantity of fill is the minimum amount practicable. Minimization must be shown for each of the alternate sites in the analysis of avoidance.</p>	<p>Minimization (Step 2): If the "avoidance" presumption is overcome, the next step is to analyze all practicable alternatives which minimize damages to wetlands within a practicable site. Minimization involves a look at on-site reconfiguration of the project, implementation of special operating procedures, or other actions to reduce impacts. Project modifications to minimize adverse impacts may include a reduction in scope or size, change in construction methods, or the use of other methods that reflect sensitivity to the environment.</p>
USACE-2d	<p>Include all supportive records and drawings, as attachments, used to document the Section 404(b)(1) Alternative Analysis.</p>	<p>The Section 404(b)(1) Alternatives Analysis should be a "stand-alone" document and include all drawings and supportive documentation. It can be integrated with the Public Interest review/evaluation (see USACE-1) to avoid duplication.</p>

Appendix B: Detroit Edison Company Responses to RAIs

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: June 19, 2009
NRC3-09-0010

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML091940218

<u>RAI Question</u>	<u>Subject</u>
AE5.3.1.2-1	Aquatic Ecology
AL9.3-2	Alternative Sites
CR4.1.3-6	Historic Properties
CR4.1.3-8	Historic Properties
HH6.2-1	Impacts to Members of the Public
HY2.3.1-2	Hydrology
HY2.3.1-14	Hydrology
HY4.2.1-9	Hydrologic Alterations
LU1.2-1a	Land Use
SE2.5.4-1	Environmental Justice
SE4.4.2-1	Social and Economic Impacts
SE4.4.2-2	Social and Economic Impacts
SE4.4.2-3	Social and Economic Impacts
SE4.4.2-4	Social and Economic Impacts
SE5.11-2	Cumulative Impacts Related to Station Operation
TE2.4.1-4	Terrestrial Ecology
TE2.4.1-5	Terrestrial Ecology
TE2.4.1-6	Terrestrial Ecology
TE2.4.1-8	Terrestrial Ecology
TE2.4.1-11	Terrestrial Ecology

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: July 31, 2009
NRC3-09-0012

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML092290662

<u>RAI Question</u>	<u>Subject</u>
GE2-1	General
GE2-2	General
AE2.4.2-1	Aquatic Ecology
AQ3.6.3-3	Air Quality and Meteorology
BC10.4.2-1	Benefit-Cost Balance
CR4.1.3-1	Cultural Resources
CR4.1.3-5	Cultural Resources
HH5.3.4-1	Human Health
HH5.4.1-1	Human Health
HH5.4.1-2	Human Health
HH5.4.2-1	Human Health
HY2.3.1-6	Hydrology
HY2.3.1-9	Hydrology
HY2.3.1-11	Hydrology
HY2.3.1-12	Hydrology
HY2.3.1-13	Hydrology
HY4.6-3	Hydrology
HY5.3.2-1	Hydrology
HY5.3.2-3	Hydrology
HY5.3.2-4	Hydrology
HY5.3.2-5	Hydrology
LU1.2-1c	Land Use
SE2.5.1-1	Socioeconomics
SE4.4.2-5	Socioeconomics
TE2.4.1-3	Terrestrial Ecology
TE2.4.1-7	Terrestrial Ecology
TE4.3.1-3	Terrestrial Ecology

<u>RAI Question</u>	<u>Subject</u>
TL4.1.2-2	Transmission Lines
TL4.1.2-3	Transmission Lines

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: August 25, 2009
NRC3-09-0013

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML092400475

<u>RAI Question</u>	<u>Subject</u>
AE5.2.2-1	Aquatic Ecology
AL9.3-1	Alternative Sites
AQ2.7-5	Air Quality and Meteorology
AQ3.6.3-1	Air Quality and Meteorology
CR4.1.3-3	Cultural Resources
CR4.1.3-9	Cultural Resources
HH3.6.3-1	Human Health
HY2.3.1-10	Hydrology
TE2.4.1-1	Terrestrial Ecology

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: September 30, 2009
NRC3-09-0014

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML093350028

<u>RAI Question</u>	<u>Subject</u>
AC7.1-1	Accidents
AC7.2-1	Accidents
AC7.2-2	Accidents
AQ2.7-4	Air Quality and Meteorology
CR2.5.3-1	Cultural Resources
CR4.1.3-7	Cultural Resources
FC5.7-1	Fuel Cycle
FC5.7-2	Fuel Cycle
HH5.4.1-3	Human Health
HY2.3.1-8	Hydrology
HY2.3.1-15	Hydrology
HY4.2.1-7	Hydrology
HY4.2.1-8	Hydrology
HY5.3.2-2	Hydrology
NO3.7-1	Noise
NO4.4.1-1	Noise
NO5.8.1-1	Noise
TE4.3.1-5	Terrestrial Ecology
TR7.4-1	Transportation

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: October 30, 2009
NRC3-09-0015

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML093090165

<u>RAI Question</u>	<u>Subject</u>
GE2.2-1	General
AC7.3-1	Accidents
AE4.3.2-1	Aquatic Ecology
AQ2.7-3	Air Quality and Meteorology
AQ3.6.3-2	Air Quality and Meteorology
AQ5.8.1-1	Air Quality and Meteorology
BC10.4.2-2	Benefit-Cost Balance
HH4.5-1	Human Health
HH4.5-2	Human Health
HH4.5-3	Human Health
HH4.5-4	Human Health
HH5.4.3-2	Human Health
HH5.4.3-3	Human Health
HH5.4.4-1	Human Health
HH5.11.7-1	Human Health
HY4.2.1-10	Hydrology
HY5.11-1	Hydrology
LU1.2-1b	Land Use
LU4.4.2-1	Land Use
NO4.4.1-2	Noise
SE4.4.2-6	Socioeconomics
TE4.3.1-2	Terrestrial Ecology
TE4.3.1-6	Terrestrial Ecology
TR3.8-1	Transportation
TR3.8-2	Transportation

<u>RAI Question</u>	<u>Subject</u>
TR3.8-3	Transportation
TR3.8-4	Transportation
TR3.8-5	Transportation
TR4.8.3-2	Transportation

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: November 23, 2009
NRC3-09-0016

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML093380331

<u>RAI Question</u>	<u>Subject</u>
GE1.2-1	General
GE1.2-2	General
GE1.2-3	General
AE2.4.2-2	Aquatic Ecology
AE2.4.2-3	Aquatic Ecology
AE2.4.2-4	Aquatic Ecology
AQ2.7-2	Air Quality and Meteorology
AQ5.3.3.1-1	Air Quality and Meteorology
CR4.1.3-4	Cultural Resources
HH5.4.2-2	Human Health
HH5.4.3-1	Human Health
HY4.2.1-3	Hydrology
HY4.2.1-11	Hydrology
HY5.2-1	Hydrology
HY4.2.1-9	Hydrology
LU4.1.1-1	Land Use
SE2.5.2-1	Socioeconomics
SE2.5.2-2	Socioeconomics
SE4.4.2-7	Socioeconomics
SE4.4.2-10	Socioeconomics
TE2.4.1-2	Terrestrial Ecology
TE2.4.1-9	Terrestrial Ecology
TE2.4.1-10	Terrestrial Ecology
TE4.3.1-7	Terrestrial Ecology
TR4.8.3-1	Transportation

From: Detroit Edison Company

To: U.S. Nuclear Regulatory Commission

Date: December 2009
NRC3-09-0017

Subject: Detroit Edison Company Response to NRC Requests for Additional Information
Related to the Environmental Review

Ascension No.: ML09_____

<u>RAI Question</u>	<u>Subject</u>
GE1.1-1	General
GE3.1-1	General
GE4-1	General
AQ2.7-1	Air Quality
AQ4.4.1-1	Air Quality
AQ6.4-1	Air Quality
CR4.1.3-2	Cultural Resources
HY2.3.1-1	Hydrology
HY2.3.1-2	Hydrology
HY2.3.1-3	Hydrology
HY2.3.1-4	Hydrology
HY2.3.1-5	Hydrology
HY2.3.1-7	Hydrology
HY4.2.1-1	Hydrology
HY4.2.1-2	Hydrology
HY4.2.1-4	Hydrology
HY4.2.1-5	Hydrology
HY4.2.1-6	Hydrology
HY4.6-1	Hydrology
HY4.6-2	Hydrology
SE2.5.2-3	Socioeconomics
SE4.4.2-8	Socioeconomics
SE4.4.2-9	Socioeconomics
TE2.4.1-11	Terrestrial Ecology
TE4.3.1-1	Terrestrial Ecology
TE4.3.1-4	Terrestrial Ecology
USACE-1	U.S. Army Corps of Engineers RAI

RAI Question

USACE-2

Subject

U.S. Army Corps of Engineers RAI

Appendix C: Alternatives Wetland Impact and Cut and Fill Analysis

For this review, no onsite reconnaissance was conducted, and actual conditions could vary from what is described herein. This review was conducted as a screening-level survey to evaluate the general presence of wetlands, waters of the United States, or floodplains and potential impacts on these resources related to siting a nuclear power plant. The selected location would be subject to a more detailed analysis, including an onsite wetland delineation. It should be noted that the preferred site selection considered many other environmental factors beyond just waters of the United States impacts. A comprehensive, siting-level environmental review was conducted to arrive at the best overall site. Several sites, despite having relatively few impacts on waters of the United States, exhibited other environmental impacts that influenced their overall environmental suitability, resulting in environmental impacts that were comparable to or greater than the preferred site. Refer to ER Section 9.2, Energy Alternatives, for a description of this analysis.

The presence of potential wetlands was determined by an offsite analysis using site-specific NWI digital data overlaid on a U.S. Geological Survey (USGS) topographic map. The NWI data may include water bodies not normally considered wetlands, such as streams and rivers, small ponds, or lakes. Water bodies not otherwise identified as wetlands by the NWI were determined using data from the National Hydrography Dataset (NHD). The NHD is a comprehensive digital dataset that represents the surface water of the United States. This information was reviewed using ArcGIS to evaluate the likely locations of wetlands or other waters of the United States, without regard to potential jurisdictional status. Areas classified as wetlands by the NWI were considered potential wetlands. Areas without NWI classifications were considered non-wetlands, provided this determination was consistent with the landscape conditions, based on the topographic map contours and NHD data. Because the NWI usually does not include wetlands smaller than about one ac., wooded areas, streams, and drainage ditches were avoided where possible, because these areas could contain unmapped wetlands.

FEMA floodplain maps also were reviewed in digital form on the Internet to evaluate potential floodplain impacts. Only portions of the power plant footprint within the one percent flood limits (100-year floodplain) were considered to cause floodplain impacts. In some cases where digital data was not available (Sites C and F), potential floodplain impacts were evaluated using NHD data and topographic maps.

C.1 Alternative Site A (Petersburg)

The DCD Plan location within the site is southeast of the intersection of Payne Road and Morocco Road (refer to Figure AppC-1, Site A ESBWR DCD Plan Layout). This location is characterized as agricultural land. Small woodlots occur to the southeast and southwest of the ESBWR DCD Plan location. There is also a two-ac. pond located southwest of the power plant location. Two drains occur near the power plant location, Saxton and Lockwood Drain associated with Morocco Road, and Sunior Drain, approximately 1,300 feet south of the power plant location, based on USGS topographic map information. These drains may have been modified or removed since the topographic maps were published.

No impacts on wetlands or other waters of the United States would occur from either the ESBWR DCD Plan Layout or the Impact Minimization Layout, based on the offsite review. Grading of the initial location (to level the ground and match the established elevation or cut) would require the removal of 35,678 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 40,321.2 cu yd. of fill would be required. The Impact Minimization Layout (refer to Figure AppC-2, Site A Impact Minimization Layout) resulted in reductions of cut (42.2 cu yd.) and fill (6,273.7 cu yd.) (refer to Table C-1). No floodplain data were available for this location.

C.2 Alternative Site C (South Britton)

The ESBWR DCD Plan location within the site is northeast of the intersection of Pocklington Road and Downing Highway (refer to Figure AppC-3, Site C ESBWR DCD Plan). This location is characterized as agricultural land. An unnamed drain is located along the southern power plant location boundary at Pocklington Road. A tributary to the South Branch of Macon Creek is located 1,500 feet south of the power plant location. The Wahoo Prairie Drain is located 2,300 feet northeast of the site and Schreeder Creek is 3,000 feet to the west. According to the NWI, there are no wetlands within the site. No floodplain data were available for this location.

An Impact Minimization Layout was not required because no impacts on wetland or other waters of the United States would occur at the ESBWR DCD Plan location, based on the offsite review. Grading of the ESBWR DCD Plan location (to level the ground and match the established elevation or cut) would require the removal of 50,126 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 57,809.4 cu yd. of soil would be required (refer to Table C-1).

C.3 Alternative Site F (Greenwood Energy Center)

The selected ESBWR DCD Plan location within the site is west of Kilgore Road and south of Wilkes Road (refer to Figure AppC-4, Site F ESBWR DCD Plan Layout). This location is characterized as a woodlot, agricultural land, and fallow land associated with the Greenwood Energy Center. Engles Drain is located in the southeastern portion of the power plant location. Jackson Drain is immediately northwest of the power plant location, within 400 feet along the western location boundary. According to the NWI, there are no wetlands within the power plant location, although there are seven wetlands within the site, based on the offsite review. No floodplain data were available for this location.

As indicated on Figure AppC-4, Site F ESBWR DCD Plan Layout, the ESBWR DCD Plan location would affect approximately 1,313 feet of Engles Drain. The 33-ac. woodlot would be removed. In addition, a railroad spur associated with the Greenwood Energy Center would need to be removed or modified. Grading of the ESBWR DCD Plan location (to level the ground and match the established elevation or cut) would require the removal of 287,125.4 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 277,483.9 cu yd. of fill would be required (refer to Figure AppC-4, Site F ESBWR DCD Plan Layout).

The generic plant layout was rotated 90 degrees and reconfigured to produce the Impact Minimization Layout (refer to Figure AppC-5, Site F Impact Minimization Layout). This arrangement results in no impacts on Engles Drain or the railroad spur, but the woodlot still would be removed. The Impact Minimization Layout results in a reduction of 76,373.5 cu yd. of cut and 44,179.1 cu yd. of fill (refer to Table C-1).

C.4 Alternative Site N (Belle River/St. Clair)

The selected power plant location within the site is located southeast of the intersection of Puttygut Road and King Road (refer to Figure AppC-6, Site N ESBWR DCD Plan Layout). This location is characterized as agricultural fields. A transmission line associated with the existing power plant to the east traverses the northern half of the power plant location from east to west. According to the NWI, forested wetland and a large excavated pond are to the east, and an excavated forested wetland is to the south. On the larger site, there are 37 NWI wetlands. In addition, five drains or ditches are nearby; these are not affected by the power plant location. According to FEMA Q3 flood hazard data, there is a floodplain within the power plant location near the forested wetland, east of the location. This floodplain would be affected by construction activities, although the extent of any impacts is not clear.

No impacts on wetlands or other waters of the United States would occur from either the ESBWR DCD Plan location or the Impact Minimization Layout, based on the offsite review. Grading of the initial location (to level the ground and match the established elevation or cut) would require the removal of 241,107.5 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 211,856.4 cu yd. of fill would be required. In addition, the existing transmission line would need to be moved to make room for the new power plant cooling towers. The Impact Minimization Layout (refer to Figure AppC-7, Site N Impact Minimization Layout) represents a means to avoid impacts on this transmission line, but cut and fill volumes would be unchanged.

C.5 Alternative Site W-1 (Port Austin)

The selected power plant location within the site is north of Port Crescent Road and east of U.S. Highway 53 (refer to Figure AppC-8, Site W1 ESBWR DCD Plan Layout). This location is characterized as agricultural land. An existing transmission line traverses the power plant location from east to west, approximately 200 feet north of Port Crescent Road. Ahearn Drain is located approximately 600 feet west of the power plant location. Two unnamed drains are located to the northeast and northwest at roughly 1,400 feet and 1,600 feet from the power plant location, respectively. According to the NWI, there are no wetlands within the power plant location, although there are 38 wetlands within the site, as well as 19 ditches, drains, or streams. No floodplain is present within 300 feet of the location.

No impacts on wetlands or other waters of the United States would occur from the ESBWR DCD Plan location, based on the offsite review. Grading of the initial location (to level the ground and match the established elevation or cut) would require the removal of 233,672.2 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 242,146.4 cu yd. of fill would be required (refer to Table C-1). Relocation of the existing transmission line may not be required, so a secondary layout was not prepared.

C.6 Alternative Site W-2 (Caseville)

The selected power plant location within the site is northwest of the intersection of Maxwell Road and Limerick Road (refer to Figure AppC-9, Site W2 ESBWR DCD Plan Layout). This location is characterized as agricultural land. The Pigeon River is located approximately 2,400 feet west of the power plant location. An unnamed drain or ditch tributary to Fisher Drain terminates approximately 250 feet from the northeastern corner. Another unnamed tributary is associated with Maxwell Road, approximately 1,300 feet east of the power plant location. According to the NWI, there are no wetlands within the power plant location. No floodplain is present within 300 feet of the location.

No impacts on wetlands or other waters of the United States would occur from the ESBWR DCD Plan location, based on the offsite review. Grading of the initial location (to level the ground and match the established elevation or cut) would require the removal of 116,274.4 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 131,685.1 cu yd. of fill would be required. To minimize cut and fill volumes, the power plant location was relocated approximately 150 feet west (refer to Figure AppC-10, Site W2 Impact Minimization Site Layout), which resulted in an increased cut of 193.4 cu yd. and 9,540 cu yd. of reduced fill (refer to Table C-1).

C.7 Alternative Site W-3 (Bay Port)

The selected power plant location within the site is northwest of the intersection of Henne Road and Pobanz Road (refer to Figure AppC-11, Site W3 ESBWR DCD Plan Layout). This location is characterized as agricultural land. An unnamed drain or ditch is located 600 feet west of the power plant location. Mud Creek is located 1,200 feet east of the site. According to the NWI, there are no wetlands within or near the power plant location. There are nine NWI wetlands within the larger site, as well as two additional drains and Wasserman Creek. No floodplain is present within 300 feet of the location.

No impacts on wetlands or other waters of the United States would occur from the ESBWR DCD Planlocation, based on the offsite review. Grading of the initial location (to level the ground and match the established elevation or cut) would require the removal of 121,829.4 cu yd. of soil. To elevate portions of the power plant location (to match the established elevation), 117,287.8 cu yd. of fill would be required (refer to Table C-1).

Table C-1 Alternative Sites Wetlands Summary

Site	Wetlands	Wetland Codes (count)	Other Features	ESBWR DCD Plan Layout		Impact Minimization Layout		Max WL Impacts (ac.)	Min WL Impacts (ac.)
				Cut Volume (yd ³)	Fill Volume (yd ³)	Cut Volume (yd ³)	Fill Volume (yd ³)		
A	2	PUBHx; PFOC	Senior Drain; Flagler and Wadsworth Drain	35,678	40,321.2	35,635.8	34,047.7	0.00	0.00
C	--	No Wetlands	Schreeder Brook; South Branch Macon Creek; Wahoo Prairie Drain	50,126	57,809.4	--	--	0.00	0.00
F	7	PUBGx (2); PUBG (1); PEMB (1); Pf (1); L1UBHx (2)	Pohly Drain; Jackson Drain; Hayes Drain; Plum Creek	287,125.4	277,483.9	210,751.9	233,304.8		
N	37	PUBGx (18); PUBKx (1); PSSC (4); PEMC (2); PEMB (2); PFO1Cx (3); PFOC (7)	Five drainage ditches	241,107.5	211,856.4	--	--	0.00	0.00
W1	41	PFOC (9); PFO1C (4); PFO/SSC (9); PEMC (5); PSS/EMC (5); PEMU (2); PFO4/SSC (1); PSSC (5); PSS1/EMC (1)	19 ditches; Schramm Branch	233,672.2	242,146.4	--	--	0.00	0.00
W2	13	PFO1C (8); PSS1Fd (2); PSS1Bd (2); PFO/SS1C (1)	10 drainage ditches	116,274.4	131,685.1	116,467.8	122,145.1	0.00	0.00
W3	9	PFOC (1); PFO1C (5); Pf (1); PFO1/SSC (1); PEMC (1)	Four drainage ditches; Wasserman Creek	121,829.4	117,287.8			0.00	0.00

Figure AppC-1 Site A ESBWR DCD PlanLayout

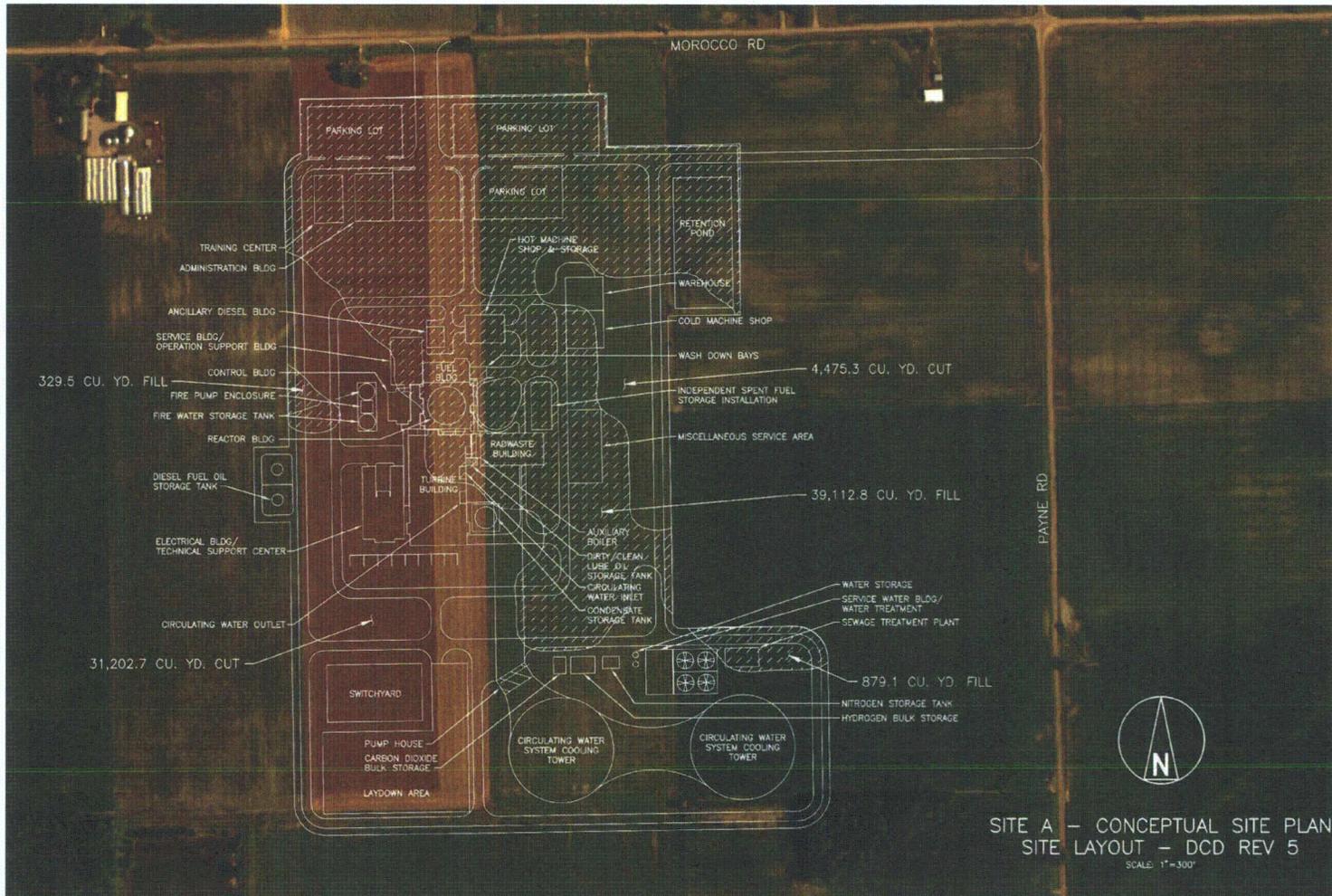


Figure AppC-2 Site A Impact Minimization Layout

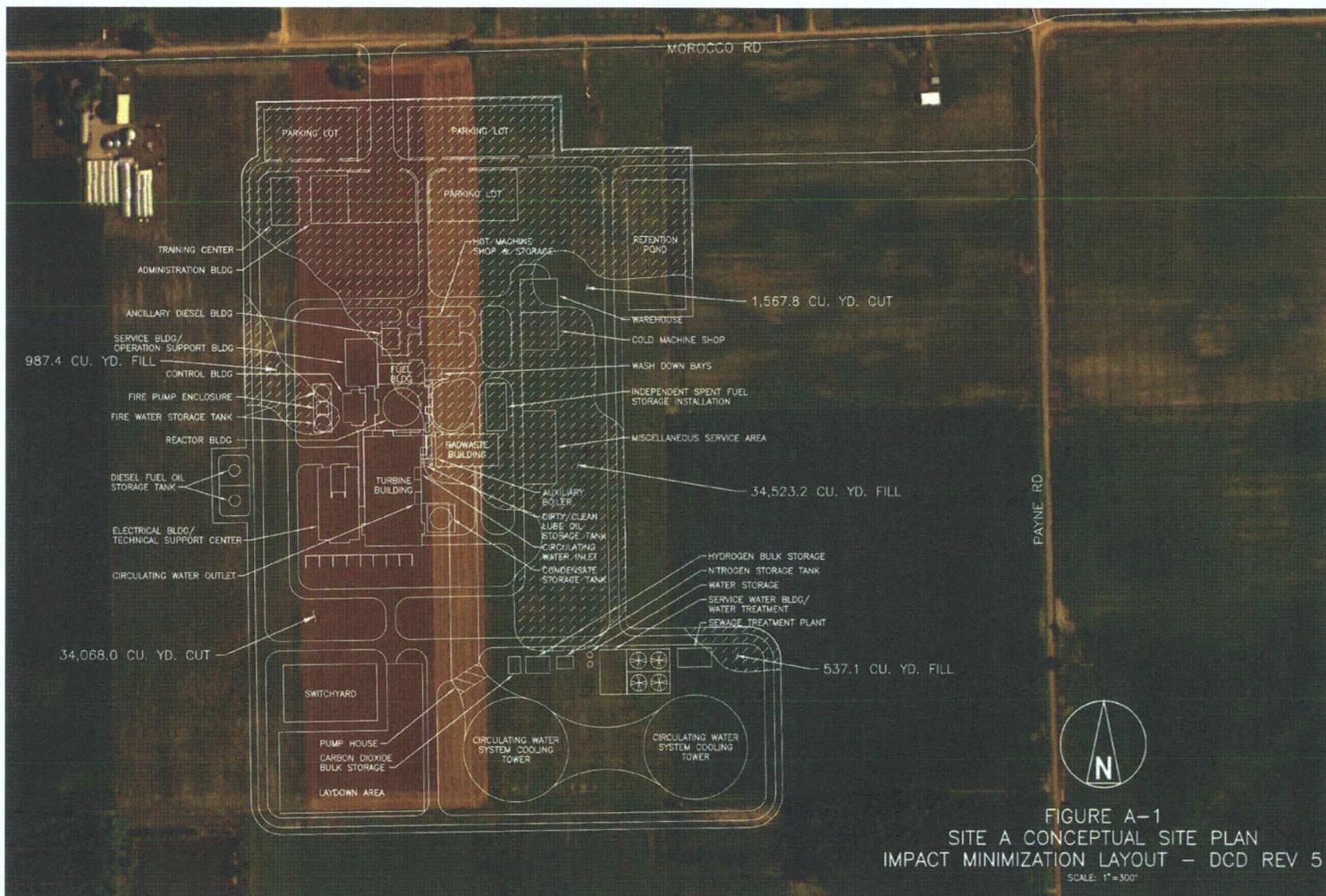


FIGURE A-1
 SITE A CONCEPTUAL SITE PLAN
 IMPACT MINIMIZATION LAYOUT - DCD REV 5
 SCALE: 1" = 300'

Figure AppC-3 Site C ESBWR DCD Plan Layout

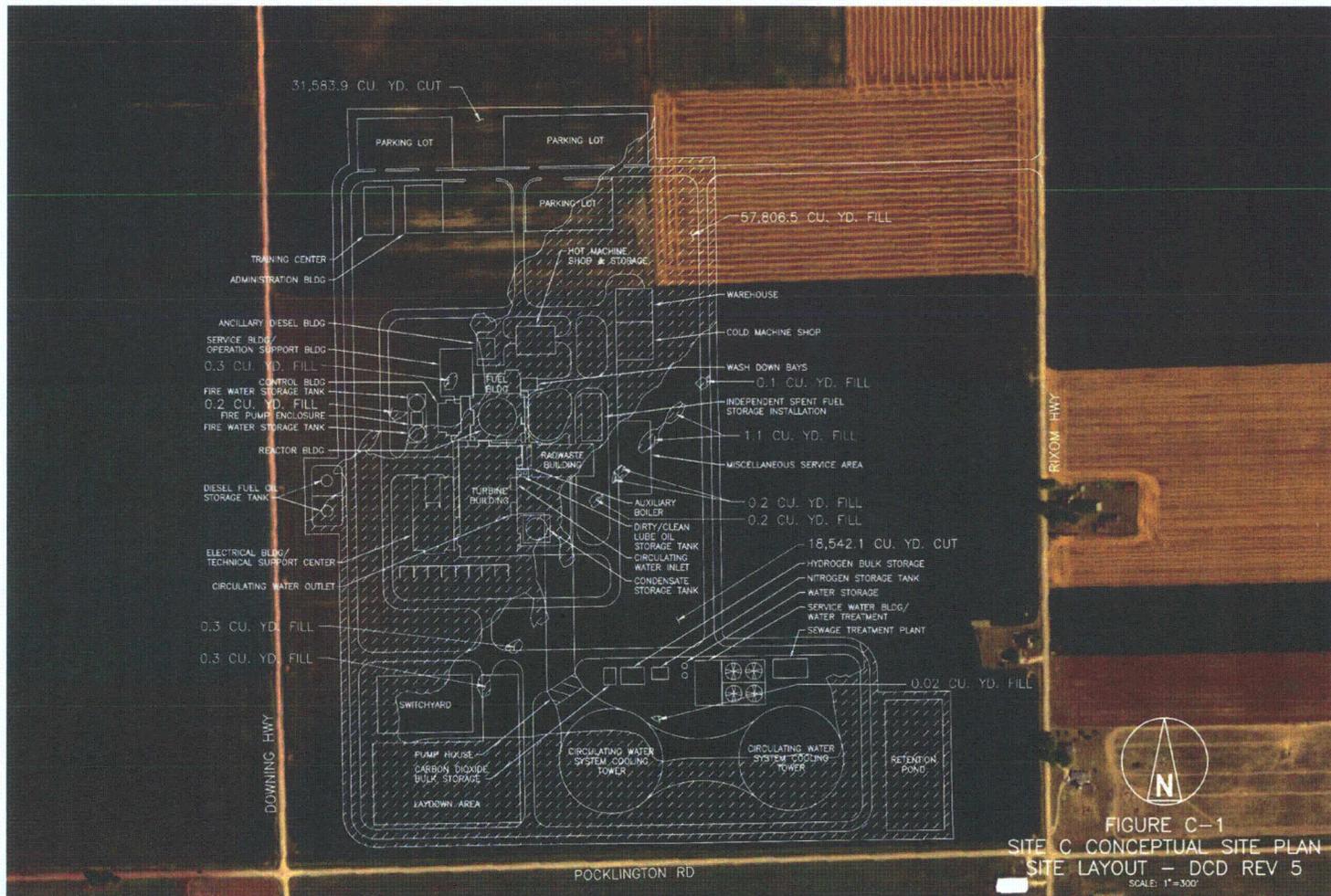


Figure AppC-5 Site F Impact Minimization Layout

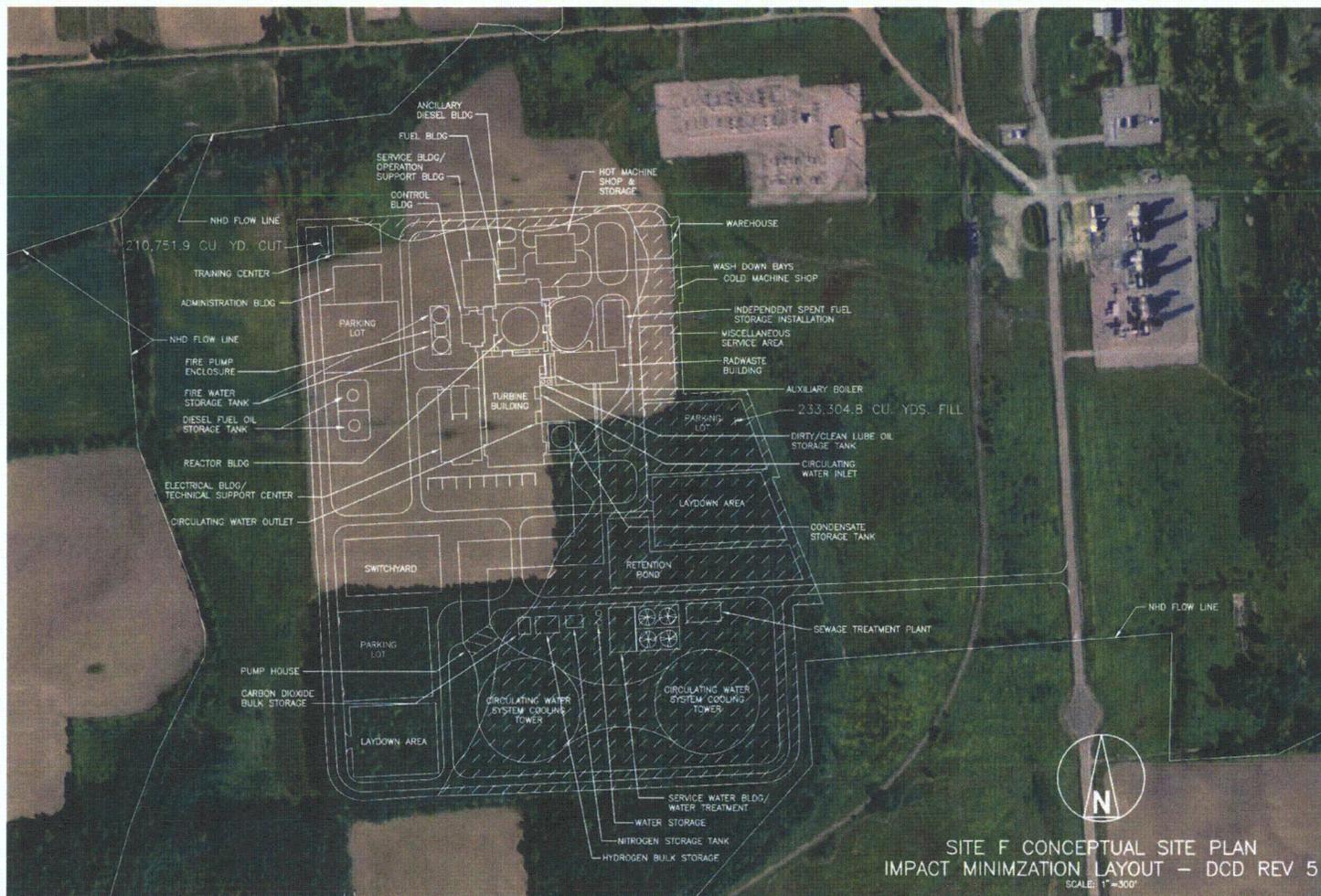


Figure AppC-7 Site N Impact Minimization Layout

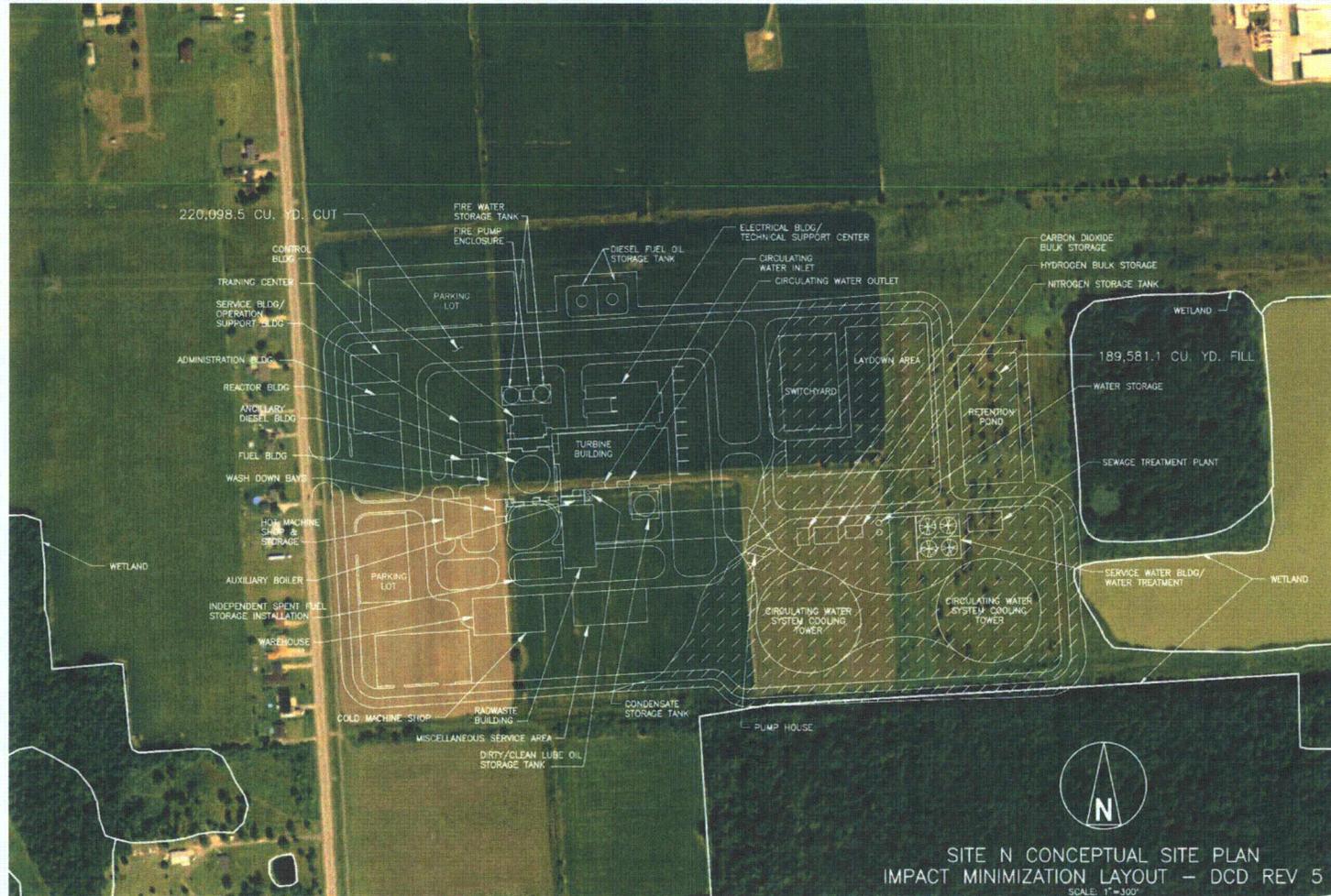


Figure AppC-8 Site W1 ESBWR DCD PlanLayout



Figure AppC-9 Site W2 ESBWR DCD PlanLayout



Figure AppC-10 Site W2 Impact Minimization Site Layout



Figure AppC-11 Site W3 ESBWR DCD PlanLayout

