National Telecommunications and Information Administration

Environmental Assessment

Peninsula Fiber Network's NTIA Middle Mile Broadband Infrastructure Project Federal Award # 26-40-MM196 EA Unique ID # EAXX-006-60-23D-1763745032 Infrastructure for Michigan's Peninsulas and Critical Crossings (IMPACC) – Project 1 and Project 2

Allegan, Antrim, Berrien, Charlevoix, Kent, Otsego, Schoolcraft and Van Buren Counties, Michigan, and Cook County, Illinois

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ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BEAD	Broadband Equity, Access, and Deployment (Program)
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
CMU	Central Michigan University
CWA	Clean Water Act
dB	decibel
dBA	Decibels on the A-weighted Scale
EA	environmental assessment
EFH	essential fish habitat
E.O.	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FirstNet Authority	First Responder Network Authority
GAP	gap analysis project
Gb	gigabit
Gbps	gigabit per second
HDD	horizontal directional drilling
HDPE	high-density polyethylene
IPaC	Information for Planning and Consultation
IXC	interexchange carrier point
LRR	Land Resource Region
Mbps	Megabits per second
MBTA	Migratory Bird Treaty Act
MLRA	Major Land Resources Area
MM	Middle Mile (Broadband Infrastructure Program)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPSBN	Nationwide Public Safety Broadband Network
NRCS	Natural Resources Conservation Service
NTIA	National Telecommunications and Information Administration
NWI	National Wetlands Inventory
PC	Program Comment for Federal Telecommunications Projects
PEIS	programmatic environmental impact statement
POI	points of interconnection
RCRA	Resource Conservation and Recovery Act
RF EME	radio frequency electromagnetic energy
ROW	right-of-way
SHPO	State Historic Preservation Office

SSURGO	Soil Survey Geographic Database
TBCP	Tribal Broadband Connectivity Program
UP	Upper Peninsula
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCS	Wetlands Classification Standard

1. Introduction

The Consolidated Appropriations Act of 2021 and the Infrastructure Investment and Jobs Act of 2021 appropriated $49.8 billion for the National Telecommunications and Information Administration (NTIA) to bring broadband service to unserved and underserved locations across the United States through its broadband grant programs, which include the Broadband Equity, Access, and Deployment (BEAD) Program, the Enabling Middle Mile Infrastructure Grant Program (MM Program), and the Tribal Broadband Connectivity Program (TBCP). The NTIA broadband grant programs will expand access to high-speed internet by funding infrastructure deployment in 50 states, 5 territories, and the District of Columbia.

Peninsula Fiber Network, LLC (PFN) is proposing to construct middle mile infrastructure as the recipient of a grant from NTIA under the MM Program, as part of award number 26-40-MM196. The Infrastructure for Michigan's Peninsulas and Critical Crossings (IMPACC) or "Project" would bring middle mile infrastructure to unserved and underserved areas across Michigan. Several last mile providers are committed to interconnecting with PFN's middle mile infrastructure to serve the households and businesses along the Project. PFN would allow wholesale broadband services at reasonable rates on a carrier-neutral basis and strengthen national security. Project 1 is located within Berrien, Van Buren, Allegan, and Kent Counties, Michigan, and Cook County, Illinois. Project 2 is located within Schoolcraft, Charlevoix, Antrim, and Otsego Counties, Michigan (see **Figures 1 through 3** on the following pages that represent the Project area and components). More detailed route information is included on overview maps and staking sheets in **Appendix A**.

NTIA is the lead federal agency responsible for evaluating the Project under the National Environmental Policy Act (NEPA).

In 2024, NTIA adopted the five Regional Programmatic Environmental Impact Statements (PEISs) that were originally issued in 2017 by the First Responder Network Authority (FirstNet Authority) under NEPA. The PEISs evaluate broadband deployments associated with the Nationwide Public Safety Broadband Network (NPSBN)[1] and contain detailed environmental analyses of the potential environmental impacts of various telecommunications deployment methods in states and territories, including:

- Collocation of network equipment on existing towers, poles, and structures;
- New construction of towers, poles, and associated structures (including generators, equipment sheds, fencing, and concrete pads);
- Use of existing fiber facilities, including lighting up dark fiber and installation of new fiber on new and existing poles and in existing conduit;
- Installation of new conduit and fiber using trenching (including vibratory plowing) or directional boring (including horizontal directional drilling [HDD]);
- Satellite deployments;
- Installation of microwave facilities for cell-site backhaul communication; and
- Utilization of deployable technologies.

[1] *See* FirstNet Authority, Regional PEISs, https://www.firstnet.gov/network/environmental- compliance/projects/regional-programmatic-environmental-impact-statements.

In its Records of Decision adopting the PEISs, NTIA confirmed that the PEISs remain valid and provide relevant and adequate assessments of the potential environmental effects and benefits of grant funded broadband projects.[2]

This site-specific environmental assessment (EA) tiers off of the Central Region PEIS by summarizing and, where appropriate, incorporating the PEIS analyses by reference. Section 1 of this EA states NTIA's purpose and need for the proposed action below. Section 2 describes the Project and alternatives to the Project, and section 3 analyzes the affected environment and the environmental consequences of the Project and alternatives. Section 4 evaluates reasonably foreseeable effects and section 5 lists relevant laws, regulations, and permits required for PFN to implement the Proposed Action.

In accordance with the Central Region PEIS and based on site-specific analysis, the EA concludes that the effects of the Project would be less than significant. Best management practices (BMPs) and mitigation measures would be implemented where appropriate to further reduce impacts.

1.1. Purpose and Need

NTIA's broadband grant programs are part of a nationwide effort to make high-speed internet service available to all Americans by: 1) connecting students to quality education and training; 2) enabling businesses to more readily connect to consumers, increasing sales and creating jobs; 3) increasing accessibility to telehealth services; 4) connecting the public to services, first responders, elected officials, and their communities; and 5) increasing workers' access to job opportunities and skills development.

The MM Program provides funding for the expansion and extension of middle mile infrastructure across the U.S. and territories. In total, the program allocated $980 million in the Summer of 2023 to fund construction, improvement, or acquisition of middle mile infrastructure projects covering more than 370 counties across 40 states and Puerto Rico. The ultimate purpose of this funding is to expand and strengthen U.S. high-speed internet networks by reducing the cost of connecting unserved or underserved areas to the internet backbone.

Throughout the nation, the digital divide has had substantial effects on the economic development of rural homes and businesses. Nearly 1.24 million Michigan households (31.5 percent) do not have a permanent, fixed internet connection, and nearly 31 percent of households earning less than $20,000 annually (197,000 persons) do not have a broadband connection. Broadband now serves as the definitive infrastructure driving global economic transformation. Project 1 and Project 2 would bring middle mile infrastructure to unserved and underserved areas across Michigan.

To accomplish these goals, PFN was awarded funding to construct three independent projects (Project 1, Project 2, and Project 3) that traverse Lake Michigan and would bring much needed middle mile infrastructure to unserved and underserved counties and communities in Michigan, supporting broadband internet connectivity for approximately 30,500 homes and businesses. Project 3 had independent utility, was cleared by NTIA via a Categorical Exclusion, and is currently under construction. This document focuses on Project 1 and Project 2. Project 1 extends approximately 239 miles from southern Chicago, Illinois to St. Joseph, Michigan and from northern Chicago, Illinois to Benton Harbor, Michigan, converges near Benton Heights, and then proceeds to Byron Center. Project 2 extends

[2] *See* NTIA, Records of Decision Adopting FirstNet Authority Regional PEISs, https://broadbandusa.ntia.gov/first-responder-network-authority-regional-programmatic-environmental-impact-statements

approximately 141 miles from Gulliver, Michigan in the Upper Peninsula (UP), to an interexchange carrier (IXC) point in Gaylord, crossing Lake Michigan and Beaver Island in the process. Projects 1 and 2 would serve approximately 28,000 homes in need of broadband internet connectivity.

Projects 1 and 2 would both install fiber along the lakebed of Lake Michigan. Unique to Michigan's geography, these submarine lines provide alternative routes to connect Michigan to Chicago and to connect the Upper and Lower Peninsulas. Fiber installed below the lakebed is less susceptible to severe weather and other catastrophic events, making it ideal for redundancy and resiliency. This approach strengthens the middle mile backbone for unserved and underserved communities in Michigan, while also strengthening national security.

1.2. Agency Participation

NTIA prepared this EA to identify and assess the reasonably foreseeable environmental effects of the Project and No Action Alternative, facilitate public involvement, inform agency decision-making, and recommend appropriate mitigation measures.

1.3. Public Involvement

This EA was issued for a 30-day public comment period from [date] to [date]. Public comments received during this time will be reviewed and addressed with revisions to this EA document if applicable.

2. Proposed Action and Alternatives

2.1. Proposed Action

Projects 1 and 2 incorporate terrestrial and marine fiberoptic cable deployment (**Figure 1**). Transitional structures known as shore landings would be required to connect the terrestrial cable routes to the underwater cable segments. Terrestrial work phases consist of the following subcategories:

- Terrestrial Fiber Optic Cable (FOC) Installation
    - Vibratory Plow/Trench Methods
    - Horizontal Directional Drilling (HDD) Methods
- Handholes and Boreholes
- Tree and Vegetation Clearing
- Hut Site and Staging Area Development
    - Temporary Access Planning
    - Site Preparation – Grading and Pad Preparation
- HDD Shore Landing Site Development
    - Temporary Access Planning
    - Site Preparation – Grading and Pad Preparation

Marine work phases consist of the following subcategories:

- Lakebed Fiber Placement

Components of Projects 1 and 2 were evaluated and refined in an iterative design process that involved multiple steps of evaluation of the terrestrial and marine work including potential landfall locations. During this process, various field surveys and assessments were conducted to assess route alternatives. Assessments and surveys included, but were not limited to, archaeological surveys, ecological surveys, hydrographic surveys, marine geophysical and geotechnical surveys, and a desktop critical issues analysis. As new information became available and potential landfall locations were narrowed down, project route alignments were further modified, and study areas were refined and reduced as applicable. Therefore, study areas, areas of potential effect, and impact areas as reported in various project studies, permit applications, and deliverables would vary based on the timeframe of the study within the design process (i.e., earlier studies included additional alternatives and larger buffer areas) and the overall purpose of analysis (i.e. the area of potential effect for archaeological surveys included a large buffer area, whereas project impact areas for permit applications were reflective of the actual extent of construction impacts). The values presented throughout this document are a subset of the broader areas and do not include areas not previously assessed.

Based on the final proposed alignment, Project 1 has a total length of approximately 239 miles (**Figure 1**). The total Project 1 area, including construction corridors, bore pits, shore landing sites, hut site locations, temporary staging areas, temporary access routes, and marine FOC installation is approximately 24.5 acres **(Table 2.1**).

Based on the final proposed alignment, Project 2 has a total length of approximately 141 miles (**Figure 1**). The total Project 2 area, including construction corridors, bore pits, shore landing sites, hut site locations, temporary staging areas, temporary access routes, and marine FOC installation is approximately 62.9 acres (**Table 2.1**). Projects 1 and 2 do not cross Tribal or federal lands.

Table 2.1. Project Areas

Project Area	Project 1	Project 2
Terrestrial (sq. ft.)		
Bore Install	34,153	19,179
Plow Install	437,444	2,054,494
Existing Conduit	36,324	5,238
Bore Pits	13,856	11,232
Handholes not in Bore Pits	3,104	1,152
Staging Areas	212,220	49,919
Hut Sites	420	19,992
HDD Landing Areas	171,923	179,439
Marine (sq. ft.)		
Bore Install	9,597	11,667
Plow Install	78,740	361,840
Surface Lay Single Armor Cable	61,569	25,382
Surface Lay Double Armor Cable	4,030	1,206
Articulated Pipe	2,250	417
Total Area – Sq. Ft.	**1,065,628**	**2,741,157**
Total Area – Acres	**24.46**	**62.93**

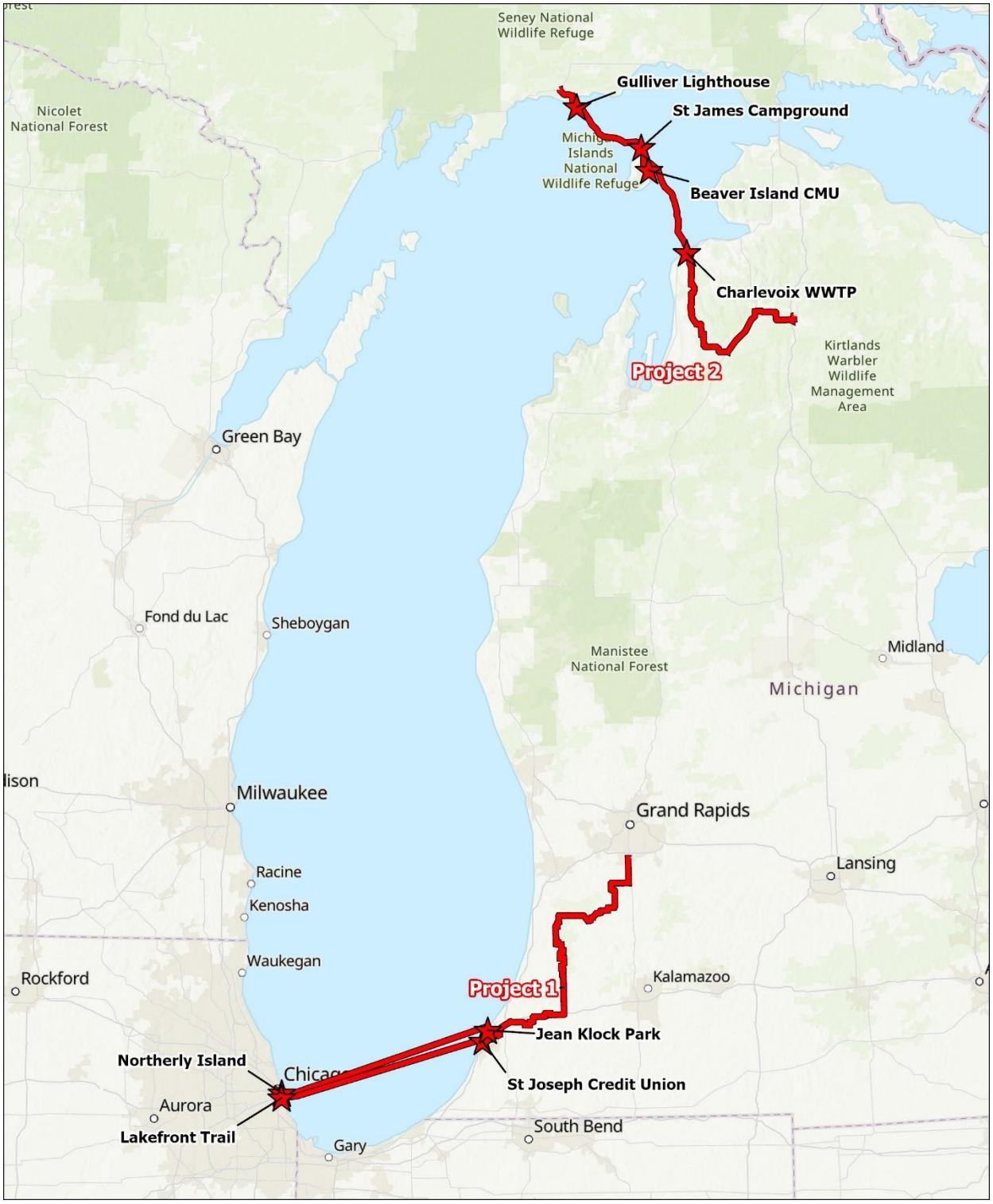

Figure 1. Regional Locations of Project 1 and Project 2

2.1.1. Terrestrial FOC Installation

The terrestrial cable routes would primarily follow existing road rights-of-way (ROWs), which are previously disturbed areas due to road construction, routine maintenance, and vegetation and tree clearing. In numerous areas, the road ROWs have also been disturbed during the installation of underground utilities, such as power, telecommunications, water, sewer, gas, etc. In more heavily populated areas or where sensitive resources exist, installation of the FOC may occur via HDD. In more rural areas where there are fewer underground utilities, the FOC would be placed with a combination of plowing in high-density polyethylene (HDPE) conduit along with HDD installation where necessary. Staking sheets in **Appendix A** provide the locations where the FOC would be installed using HDD (bore) or knife-trenching (plow) methods.

The proposed FOC would typically include between 144 and 288 optical fibers, with a diameter of less than 1 inch. The cable would typically be placed in a 1.5-inch diameter flexible HDPE conduit.

The potential exists for the proposed FOC installation to require some minimal tree disturbance, in the form of trimming, to avoid interference with construction equipment. However, as most of the proposed fiber route would be installed along existing roadway ROW, roadway maintenance (including vegetation mowing and maintenance) is a standard operating procedure performed by the landowners (city, county, state, etc.). Tree cutting may also occur at the hut sites and the HDD landing locations and is discussed in detail below.

Project 1

Project 1 extends terrestrially through unserved and underserved areas of southwest rural Michigan to an interexchange carrier (IXC) facility in Byron Center, Michigan. Project 1 consists of approximately 117.5 terrestrial miles of FOC **(Figure 2)**. The total project area of the Project 1 terrestrial route, including construction corridors, bore pits, shore landing sites, hut site locations, temporary staging areas, and temporary access routes is approximately 20.9 acres. The total area of ground disturbance anticipated from the construction of the terrestrial route for Project 1 is approximately 20.0 acres and includes terrestrial HDD entry and exit bore pits, the underground bore route, plow installation, the construction of the hut sites, temporary staging areas, and the shore landing sites for the HDD operations. Additional details on the terrestrial route construction are provided below and are shown in the staking sheets in **Appendix A**.

Figure 2. Project 1 Fiberoptic Cable Route

Project 2

Project 2 begins in Gulliver, Michigan in the UP, traverses Lake Michigan and makes landfall at Beaver Island, where a short terrestrial component traverses Beaver Island before deploying into Lake Michigan and continuing underwater to Charlevoix, Michigan. After landfall in Charlevoix, the route continues south and east through sections of underserved and unserved towns to reach an IXC point in Gaylord, Michigan. Project 2 consists of approximately 87 miles of terrestrial FOC **(Figure 3)**.

Figure 3. Project 2 Fiberoptic Cable Route

The terrestrial route for Project 2 has underground FOC spanning across four counties in northern Michigan – Schoolcraft County in the UP and Charlevoix, Antrim, and Otsego Counties connecting Gulliver, Beaver Island, and Charlevoix to Gaylord. The total project area of the terrestrial route, including construction corridors, bore pits, shore landing sites, hut site locations, temporary staging areas, and temporary access routes is approximately 53.7 acres. The total area of ground disturbance anticipated from the construction of the terrestrial route for Project 2 is approximately 53.6 acres. Ground disturbing activities include the installation of the FOC, the terrestrial HDD entry and exit bore pits, the underground bore route, plow installation, the construction of the hut sites, temporary staging areas, and the shore landing sites for the HDD operations. Additional details on the terrestrial route construction are provided below and are shown in the figures in **Appendix A** (overview maps and staking sheets).

Tree cutting may also occur at the hut sites and the HDD landing locations and is discussed in detail below.

2.1.1.1. Terrestrial Fiber Cable Installation Methods

The three anticipated methods of terrestrial FOC cable installation are knife trenching, HDD, and the use of existing conduit/tunnels. The methods are further described below:

Knife Trenching

New underground FOC may be installed using the direct underground plowing (knife trenching)

method. A 'vibra-plow' blade would be used to cut a 2 to 3-inch wide slit, or 'rip', in the ground to a depth of approximately 4 feet. A conduit would then be inserted into the slit via a chute in the blade. The rip is typically closed behind the plow, leaving limited ground disturbance, except for tire tracks left from the 'vibra-plow'. After a few weeks of normal vegetation growth and recovery along the rip and tire tracks, there is typically little to no remaining evidence of disturbance. To estimate the construction project footprint for knife-trenching, a width of 7.75 feet was utilized for the plow wheelbase. Ground disturbance areal estimates related to plowing were based on a disturbance width of 1 foot along the linear slit. Knife trenching is assumed to be the terrestrial installation method unless otherwise noted below.

HDD

HDD would be used at specific locations as an alternative installation method to avoid impacts to sensitive environmental resources or to bypass surface obstacles such as roads, railroads, or existing utilities. This method involves using a specialized directional drill to install an underground conduit, allowing the FOC to be routed beneath these features without surface disturbance beyond the bore pits. The length of the bores would vary depending on the width of the resource being crossed. For this Project, the maximum expected terrestrial bore length would be approximately 2,000 feet. The depth of a typical terrestrial HDD bore would generally be 3 to 4 feet, but the depth may vary based on topography and any existing utility crossings that are encountered. Bore entry and exit pits, each approximately 4 feet wide, 4 feet long, and 4 feet deep, would be excavated at both ends of the HDD alignment using a backhoe. The HDD entry and exit bore pits and the FOC installed via HDD methods between bore pits are included in the ground disturbance calculations, even though the FOC will have no surface disturbance. Monitoring tools and systems would be used throughout the boring process to accurately place the conduit below ground. For waterbodies that are crossed with the use of HDD methods, a minimum of 10 feet would be maintained from the top of the conduit to the bottom of the stream bed. After the conduit is installed via HDD, the FOC would either be:

- Manually pulled through the casing using vinyl ribbon pulling tape (the vinyl pulling tape is blown through the conduit with an air compressor, the pulling tape is attached to the FOC, and then FOC is then pulled through the conduit manually)
- Installed through the conduit using a fiber blowing apparatus (an air compressor-based device that pushes the FOC through the existing conduit using high-pressure air).

Existing Conduit/Tunnels:

The lease or purchase of existing conduit is available in certain areas of the Project (Chicago South Route and in Michigan). Existing conduit would be used as much as practical to minimize project costs and environmental impacts. For the Chicago North Route, the City of Chicago Freight Tunnels would be utilized to the maximum extent practicable and to the degree that approvals can be obtained. If existing conduit is available within the freight tunnels, it would be utilized to the degree practicable, or new conduit would be placed within the tunnel network. The staking sheets in **Appendix A** illustrate segments where existing conduit or tunnels may be utilized for FOC installation.

- Construction of the terrestrial fiber is expected to be completed within approximately 12 months. Work would generally be conducted five days per week, from 7 am to 7 pm.
- Use of temporary construction lighting via artificial light towers would be used when extended work hours (i.e. 24-hour per day operations) are required or during times of year when natural light is limited (< 10 hours/day). These conditions may occur during certain construction activities such as HDD installation under railways, major highway crossings, and

shore landings.

2.1.1.2. Handholes/Utility Vaults

Handholes/utility vaults would be installed along the fiber route for future access and maintenance to the FOC. Whenever possible, these would be installed in the excavations used for the HDD entry and exit bore pits. The distance between the utility vaults would vary depending on site conditions. The utility vaults/handholes, measuring up to 2.5 feet by 4 feet, would be mounted flush with the surrounding surfaces and extend up to 3 feet deep. The lid of a handhole/utility vault can support heavy loads, including extreme truck traffic.

2.1.1.3. Hut Sites

Above-ground utility structures, referred to as "huts", would be installed at key locations along the fiber optic route to house necessary equipment and support system operations. The huts are typically sited on parcels adjacent to the existing ROW to minimize interference with road ROW maintenance and landowner activities.

New hut sites may require the development of access routes, site clearing, and/or limited grading to prepare for installation. Depending on the site conditions, foundations may consist of footings or slab-on-grade construction. Each hut site would also include trenching activities to route FOC from the adjacent road ROW and the installation of electrical service to power the equipment. Whenever feasible, hut sites would also serve as staging areas to minimize the overall project footprint and reduce additional disturbance. Hut sites would be strategically located in upland areas and outside of mapped floodplains to avoid sensitive environmental impacts. Each hut structure is anticipated to have a footprint of approximately 9 feet by 21 feet, with a height of 10 feet. The total construction disturbance area would be approximately 100 feet by 100 feet per site. A typical hut site with an adjacent staging area is depicted in Photograph 12 in **Appendix B**.

Five hut sites are planned for Project 1: St. Joseph, Benton Harbor, Lawrence, Pullman, and Dumont Lake. Four hut sites would be utilized for Project 2: Gulliver, Charlevoix, Mancelona, and Beaver Island (existing hut site). The existing hut on Beaver Island exists and was constructed for a separate project but would be utilized by PFN. The locations of the hut sites are shown on the figures in **Appendix A** (Project 1 and 2 Overview Maps).

Tree clearing associated with hut sites is described in **Section 2.1.1.5** below.

2.1.1.4. Staging Areas

Temporary equipment staging areas would be used for parking construction vehicles and storing equipment and materials. These areas would be located along the fiber route, either at proposed hut sites or within existing disturbed areas such as parking lots, gravel pads, or paved surfaces, where landowner permission has been secured.

Temporary staging areas adjacent to the ROW would utilize the access routes constructed for the hut sites or existing access routes to parking lots or similar areas, and therefore no access route construction would be necessary for the temporary staging areas. Staging surfaces may consist of maintained grass, gravel, or paved surfaces such as asphalt or concrete.

Depending on existing conditions, stable working areas may require site preparation including surface leveling, tree and vegetation clearing (**Table 2.2**), or the placement of gravel. Equipment and materials, including FOC reels, would be delivered to the site via flatbed trucks and unloaded using a backhoe or similar equipment. For security, temporary fencing may be installed around the staging areas to deter theft or tampering with stored FOC reels prior to installation.

Temporary staging areas would be located at the same hut sites listed in the section above and are shown in **Appendix A** (Project 1 and 2 Overview Maps). The staging areas are approximately 150 feet by 150 feet. The staging areas would be restored upon construction completion and are expected to be used for a period of up to 6 months. Areas of ground disturbance would be stabilized and returned to the pre-construction grade as soon as possible to prevent erosion, the movement of exposed earth, and the propagation of invasive species. Stabilization techniques include erosion blankets, mulching, and reseeding. Soil decompaction may also be required in areas of routine vehicle travel or heavy equipment parking.

Restoration products such as seed mixes, mulch, or compost would not contain threatened or endangered species or invasive species and would be certified weed free. Project specific seed mixes consistent with both the Michigan Department of Environment, Great Lakes, and Energy's (EGLE's) Seeding BMP Guidance Document Revision 2019.04.02 and Michigan Department of Transportation's (MDOT's) Standard Specifications for Construction (2020), would be incorporated if ground disturbance occurs that requires restoration activities.

Follow-up monitoring would occur towards the end of the installation growing season or in the spring, if the installation occurs towards the end of the previous growing season. Restoration monitoring may occur more frequently if required by Soil Erosion Sediment Control (SESC) permits. Monitoring would include observations and notes of areas of bare ground, erosion, or invasive species that may require follow-up construction action items. Action items may include re-seeding, adding stabilization measures, soil decompaction, or controlling invasive species.

2.1.1.5. Tree Clearing

Tree clearing may be necessary to prepare the above-described hut sites, staging areas, and shore landing locations for the main construction phases. The landing locations would serve as work pads for the HDD rigs, muster locations for field crews and engineering staff, and laydown yards for equipment and materials and therefore would need space free from obstruction to facilitate the necessary project activities.

Hand operated chainsaws may be used to fell trees. Woody material is then cut into manageable sizes, to be used as firewood, milled into timber, hauled off site to an approved disposal location, or fed into a woodchipper, at which point it can then be moved to an approved disposal location. Fleet trucks, trailers or dump beds may also be used to move woody material off site. In cases where grubbing or stump grinding is needed to prepare a level surface, a grinding attachment and skid steer or backhoe can be used to bring the area to its final grade. These activities may disturb the ground to a depth of 4-6 inches but typically do not

result in significant ground disturbance. Once woody debris has been removed, the area is then raked to remove any remaining woodchips and/or shavings and restore any exposed soils.

The anticipated amount of tree clearing for the Proposed Action is presented in **Table 2.2** below.

Table 2.2. Estimated Tree Impacts

Shore Landing Location, Hut Site or Staging Area	Estimated Trees to be Cleared	Average Tree Diameter at Breast Height (DBH)(inches)	Average Tree Height (feet)	Estimated Impact Volume of Trees (cubic feet)
Project 1[+++]				
Chicago Lakefront Trail[++]	24 trees	14	30	36,911
United Federal Credit Union, St Joseph, MI*	Approx. 10-15 trees	12	25	5,200
Benton Harbor Golf Course[++]	Side trimming only	NA	NA	<100
Lawrence*	Approx. 20 trees	20	50	22,500
Pullman*	NA	NA	NA	NA
Dumont Lake*	Approx. 5 trees	14	40	4,500
Project 2				
Gulliver*	Side trimming only	NA	NA	<100
Gulliver Shore Landing[++]	4 trees	20	50	7,720
Charlevoix – WWTF South[++]	3 trees	24	50	900
Mancelona*	5 trees	10	25	4,500
Beaver Island North[+]	NA	NA	NA	NA
Beaver Island East[++]	Approx. 20 trees	20	50	22,700

* Hut site serves as a Staging Area
** Hut site is co-located at an HDD Shore Landing Location
\+ Hut site is pre-existing and no site modifications are needed
++ Site is an HDD Shore Landing
[+++] Chicago Northerly Island will have parking lot landscaping modifications of 3 ornamental trees not meeting the definition for analysis as provided by USFWS (USFWS 2026)

The Proposed Action would implement conservation measures as outlined in the Biological Assessment (BA) and U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO), which is forthcoming and once received will be included in **Appendix C**.

2.1.2. Marine FOC Installation

Project 1 includes two marine fiber connections across Lake Michigan (southern Chicago, Illinois to St. Joseph, Michigan and northern Chicago to Benton Harbor, Michigan to create a shorter, redundant,

and more reliable middle mile route to Chicago. The southern marine route is approximately 59.55 miles long and the northern route is approximately 61.89 miles long.

Project 2 spans approximately 54 miles across Lake Michigan, beginning near Gulliver in Schoolcraft County and ending in Charlevoix in Charlevoix County. This route is divided into two segments by an intermediate overland crossing on Beaver Island.

The marine FOC routes include shoreline landing sites, HDD bore holes, and submerged cables that are either laid directly on the lakebed or buried beneath it. The Lakebed Fiber Installation section below presents more information related to marine cable installation. Marine cable segments connect to terrestrial fiber segments at designated shore landing locations, integrating the land-based and underwater infrastructure.

The total project area associated with the marine route is approximately 3.59 acres for Project 1 and 9.19 acres for Project 2. The entire marine route project area is considered ground disturbance due to the installation of the FOC line along the lakebed. Four fiber cable installation methods are anticipated, as summarized below and described in greater detail in the following sections. An overview of the route installation methods is shown in the figures in **Appendix A** (Project 1 and 2 Overview Maps).

1. Burying/plowing (Nearshore and Shallow Areas)
   Burying or plowing of the fiber optic cable is anticipated in nearshore and shallower areas where an exposed fiberoptic line would be susceptible to damage. This method is estimated to have a temporary disturbance up to 20 feet in width, due to the skids of the shear/jet plow and the plow blade. The 1.5-inch diameter cable would remain in place (permanent impact).
2. Horizontal Directional Drilling (HDD) at Shore Landings
   HDD would occur at shore landings to transition from the terrestrial route to the marine route. The HDD would result in temporary disturbance from a 13-inch-diameter borehole under the bed of Lake Michigan. The borehole is considered a temporary impact as the hole would not remain open following cable installation. A maximum 6-inch-diameter casing containing the FOC would remain in place.
3. Surface lay installation (single armored cable)
   Surface lay installation of a single armored cable would occur directly on the lakebed. Disturbance area would be the diameter of the cable (1.25 inches) as the cable would remain in place (permanent impact)
4. Surface lay installation (double armored cable)
   Surface lay installation of a double armored cable would also occur on the lakebed. Disturbance area would be the diameter of the cable (1.5 inches) as the cable would remain in place (permanent impact).

2.1.2.1. Shore Landing Sites

To manage the natural and anthropogenic risks to the cable at the shoreline and in nearshore and offshore areas, various cable protection schemes would be implemented. In general, the most significant risks to cable are at the lakeshore and adjacent nearshore area. Therefore, HDD was selected at each cable landfall to manage and mitigate these shoreline/nearshore hazards.

Eight temporary landing areas would be established to support HDD operations connecting the terrestrial and marine segments of the FOC route. These areas would be used for drilling boreholes and staging equipment. Locations were selected based on their proximity to the Lake Michigan shoreline and their potential to minimize environmental impacts, favoring existing parking areas or vacant, previously disturbed lots.

Project 1 and Project 2 each have four HDD landing sites. **Table 2.3. and Table 2.4.** provide the location and total area for each landing site for Project 1 and Project 2, respectively. It is assumed that the total area for each landing site would have ground disturbance. Landing site schematics are shown in **Appendix D** (Shore Landing Sites).

Table 2.3. Project 1 Shore Landing Site Footprint and Bore Length Details

Location	Footprint Area (Acres)	HDD Bore Length (Feet)
Benton Harbor Golf Course	1.160	2,855
United Federal Credit Union	0.985	2,641
Chicago Lakefront Trail	0.847	1,895
Northerly Island	0.9856	1,495
Total:	**3.947**	**8,886**

Table 2.4. Project 2 Shore Landing Site Footprint and Bore Length Details

Location	Footprint Area (Acres)	HDD Bore Length (Feet)
Gulliver	0.620	3,325
Beaver Island North	2.133	3,374
Beaver Island East	0.620	1,905
Charlevoix WWTF, MI	0.746	2,199
Total:	**4.119**	**10,803**

HDD is a low-impact construction method compared to traditional trenching, as it minimizes overall disturbance. Specific disturbance associated with this method may include temporary access roads, temporary gravel pads, and an entry pit.

For locations where necessary, tree clearing (**Table 2.2.**), temporary access roads and surface gravel pads would be constructed prior to HDD equipment mobilization and removed after drilling is complete. The gravel pads would be a maximum of 150 feet by 250 feet and would be in place for approximately two months. Upon completion of the work, the gravel pads would be removed from each site and the disturbed area restored in a manner acceptable to the landowner.

At each shore landing, HDD would be used to install the FOC underground, allowing it to bypass nearshore obstacles and hazards. Each borehole is expected to be approximately 6 inches (13 inches maximum) in diameter and would accommodate a 4-inch casing (6-inch maximum). HDD would enable the FOC to be installed beneath areas at high risk for erosion, ecologically sensitive zones, and locations where ice scour could pose a risk to the cable.

The HDD entry points would be in upland areas, outside the boundaries of regulated wetlands and

waterbodies. A small entry pit, approximately 6 feet by 6 feet by 4 feet deep, would be excavated. Erosion and sedimentation controls, including straw bales, filter socks, silt fences, and safety fencing would be installed and maintained for the duration of operations.

A bentonite-based drilling fluid (slurry), potentially with specialized additives, would be used to stabilize the borehole and transport cuttings back to the entry pit. A solids separation system would be used to reclaim and recycle the drilling fluid, while residual slurry and cuttings would be contained and hauled off-site for proper disposal. Prior to borehole exit at the lakebed, the drill stem would be flushed with fresh water to minimize the risk of inadvertent fluid returns. Drilling mud additives would be NSF/ANSI Standard 60 certified, meaning they are non-toxic and safe for use in drilling applications that may affect drinking water quality. Examples of additives that could be used include bentonite products that are used for borehole stability and specialized additives (e.g. QUIK-FOAM® HP, QUIK-GROUT®, SYSTEM-FLOC 360, Clay-Drill) to reduce clay sticking or for dispersing sediments.

The borehole exit location would be confirmed by dive crews. Once confirmed, the drill stem would be retracted and fitted with a blunt steel nose. After reaming and final preparation, a coned or duckbill fitting would be attached to the conduit for pullback. A pre-installed stainless-steel pulling cable would then be used to pull the fiber optic cable from the lakeside exit point back to the upland transition manhole using a winch and pulley system. The transition manhole would be installed at the upland landing and connected to the HDD conduit using restrained flange couplings and HDPE pipe.

HDD operations are expected to take approximately 3 to 8 weeks, depending on bore length and subsurface conditions. The various shore landing HDD operations are expected to be completed within approximately 7 months (including site preparation and restoration work) but would depend on drillers' schedules and access restrictions. The HDD operations would need to be completed when ice does not prevent divers from inspecting the borehole exit locations and within the timeframe approved by the landowners, where applicable. The anticipated duration to advance an individual bore is approximately 3 weeks. Due to the intricacies of HDD operations, site work may advance continuously (24 hours per day, 7 days a week) during certain phases of construction. During these situations, use of construction lighting may be required.

Subsurface conditions that could cause extensions in drilling duration include hard, abrasive bedrock and the presence of gravel and/or boulders. These conditions can cause drill bits to wear excessively, increase pull forces, or lead to borehole collapse. Extended drilling operations can also arise from fractured rock, artesian groundwater pressures, and variable soil properties that require design changes or specialized equipment. As stated above, HDD advancement rates vary based on numerous factors; however, anticipated HDD bore advancement rates in rock range from 100 feet to 350 feet per day, assuming one 12-hour shift per day. HDD advancement rates in soil may range from 250 feet to 500 feet per day, assuming a 12-hour shift.

Typical equipment used to install an HDD boring includes a drill rig, mud rig, mud reclaimers, power units, generators, excavators, drill pipe, support vehicles, pumps, trailers, and storage tanks, as illustrated in **Appendix B**. The entry angle (typically 15 degrees) and bore geometry have been selected to minimize the risk of bore skipping and inadvertent fluid returns, particularly at transitions between sand and limestone. Final bore path geometry and depth are presented in the figures contained in **Appendix D**. In addition, **Appendix D** also contains conceptual drawings of the

anticipated landing site layouts.

2.1.2.2. Lakebed Fiber Placement

Beyond the HDD exit point, the FOC would be laid on the existing lakebed surface or buried to protect the cable from nearshore marine hazards. The laying of submarine cables leads to temporary lakebed disturbance, but these effects are mainly restricted to the discrete time periods related to initial installation, any future repair work, and/or removal of the cable at the end of service.

For Project 1, **Table 2.5.** presents the lengths and associated ground disturbance for each of the submarine FOC elements.

Table 2.5. Project 1 Length and Ground Disturbance for Submarine FOC Elements

Project Element	Length (Linear Feet)	Total Footprint/Ground Disturbance (Acres)
HDD FOC Installation	8,886	0.220
Submarine Cable Burial Installation	3,937	1.808
Submarine Cable Surface Lay Installation - Single Armor	592,008	1.413
Submarine Cable Surface Lay Installation - Double Armor	32,236	0.093
Submarine Cable Installation in Articulated Pipe	4,429	0.052
Total	**641,**496	3.586

For Project 2, **Table 2.6**. presents the lengths and associated ground disturbance for each of the submarine FOC elements.

Table 2.6. Project 2 Length and Ground Disturbance for Submarine FOC Elements

Project Element	Length (Linear Feet)	Total Footprint/Ground Disturbance (Acres)
HDD FOCC Installation	10,803	0.268
Submarine Cable Burial Installation	18,092	8.307
Submarine Cable Surface Lay Installation - Single Armor	244,062	0.583
Submarine Cable Surface Lay Installation - Double Armor	9,648	0.028
Submarine Cable Installation in Articulated Pipe	820	0.010
Total	**283,425**	**9.194**

Surface Lay Installation Methods

For surface lay installations, the fiber cable would be connected to a vessel carrying spooled cable for deployment across Lake Michigan. The cable would be laid directly on the lakebed surface (see figures in **Appendix A** and Photograph 13 in **Appendix B**), with the vessel adjusting its path to avoid known underwater obstructions such as boulders, sensitive resources, or existing infrastructure. The submarine cable is expected to be installed during the summer of 2027. The diameter of the submarine cable is 34 millimeters (mm) (1.3 inches); therefore, very little sediment disturbance is expected.

Cable-laying ships use a combination of dynamic positioning systems and advanced navigation software to ensure the cable lands on the lakebed in the planned location. These systems allow the ship to maintain a precise position and guide the cable's descent.

Underwater Cable Burial Methods

In certain areas, the FOC may need to be buried beneath the lakebed to manage natural and anthropogenic hazards associated with the nearshore areas. Once the underwater FOC is past the immediate shoreline and associated hazards via the HDD bore, cable protection is typically managed by cable burial. Cable burial is typically facilitated by a jet plow/water jetting or shear plowing. The underwater plowing methodologies are deployed from a dedicated ship or barge, are tightly controlled, and are monitored using advanced software that receives real-time data from various onboard instruments, including geographic positioning systems (GPS) to ensure accurate placement.

The width of a submarine cable burial trench is typically less than 1 meter (m) (approx. 3.3 feet) wide. Submarine cable plows and water jets are designed to create a very narrow, temporary trench, minimizing lakebed disturbance as the cable is simultaneously inserted below the sediment at a depth of 1.0 to 1.5 meters (3.3 to 4.9 feet) or less. The disturbance from skids associated with the cable plows is typically less than 20 feet (6.1m) wide and would be limited to surficial sediments.

In most cases, the burial lengths are limited to a relatively short distance from the HDD exit point. The route overview maps in **Appendix A** illustrate the various submarine cable installation methods that would be utilized for each crossing. Burial operations would be carried out using industry standard burial equipment. Equipment would operate at minimum power levels required to achieve expected burial and to maximize the sediment retained in the trench, thereby minimizing suspension of sediments. The impact of sediment suspension is expected only in close proximity to the trench, less than 10m (32.8 feet) on either side (OSPAR, 2009). Additional details regarding the suspension of sediment during cable burial are provided following the discussion of burial methods below.

Specific cable burial decisions would be finalized following the completion of laboratory testing of lakebed sediment samples and an engineering evaluation of these geotechnical characteristics. Final cable protection design decisions are expected to occur by mid-2026.

At this time, no anchoring is proposed during cable installation, limiting potential bottom-disturbing impacts to the area immediately underlying the proposed cable. Methods of cable burial are discussed below.

Jet Plow/Water Jetting

Jet plow or water jetting (Photograph 14 in **Appendix B**) is a preferred method for underwater cable installation due to its efficiency and relatively low environmental impact compared to traditional mechanical dredging or trenching techniques. This simultaneous cable-laying and burial method ensures the cable reaches the target burial depth while minimizing disturbance to the lakebed. The majority of fluidized sediment settles back into the trench, reducing the temporary turbidity and dispersion. Additional discussion of sediment mobilization, suspension, and deposition is included in the Sediment Suspension/Mobilization/Deposition Section below.

The system operates by drawing water from the surrounding waterbody and pressurizing it onboard the installation vessel. This water is delivered through hydraulic nozzles mounted along the length of "jetting swords," which are inserted into the sediment on either side of the cable. These nozzles generate a directed downward and backward "swept flow," fluidizing the in-situ sediment column and forming a trench. As the equipment advances along the cable route, the fluidized sediment allows the cable to settle into the trench under its own weight, achieving the planned burial depth. Importantly, the hydrodynamic forces are directed within the trench, minimizing the upward suspension of sediment into the water column and promoting sediment resettlement within the trench itself. The burial depth is controlled by pre-determined deployment settings of the jetting swords, which are hydraulically adjustable.

The water jetting system can be equipped with horizontal and vertical positioning sensors to continuously record cable position, burial depth, and installation conditions. This data is monitored in real time aboard the installation vessel to ensure compliance with design specifications.

Mechanical Plowing

Mechanical plowing creates a trench by towing a plow along the lakebed while simultaneously feeding the cable into the trench as it is formed (Photograph 15 in **Appendix B**). The plow is pulled by a surface support vessel that provides the necessary towing force for propulsion. Once the cable is laid, the trench is backfilled naturally by slumping of the trench walls and water-induced sediment movement.

Mechanical plows are a specific type of plowing equipment that can minimize sediment disturbance because they do not fluidize the sediment and typically require less force to create a narrower trench. This can result in a more targeted burial with less disruption to the surrounding substrate. However, their effectiveness depends on factors such as sediment cohesiveness and required burial depth. Shear plows are generally used for shallow cable burial (typically less than four feet), which further limits the volume of sediment displaced during installation. Sediment properties being equal, redeposition of mobilized particles would occur faster than jet plowing due to the lack of sediment fluidization.

Sediment Suspension/Mobilization/Deposition

Cable burial would result in suspension, mobilization, and deposition of lakebed sediments. The key characteristics of these processes involve the duration of sediment suspension and width of mobilization prior to redeposition.

The BERR (2008) Technical Report indicated:

- Medium or coarse sand would settle within minutes.
- The vast majority of the disturbed sediment would initially resettle within 20 meters of the cable (BERR, 2008).

The OSPAR Commission Report (OSPAR, 2008) indicated that the spatial disturbance extent for cable plowing is in the order of a 10-meter width.

In one study for a submarine cable project (AECOM, 2021), modeling predicted:

- Sediments suspended by burial operations generally remain suspended around the burial corridor centerline.
- After two hours, the maximum Total Suspended Solids (TSS) level drops below 90% for any of the simulated scenarios, while it drops below 99% after less than four hours.
- The study concluded, "The deposition of the sediment resulting from cable installation activities occurs relatively locally. Most of the released mass settles out quickly and is not transported for long distances by the (ocean) currents."

For another submarine cable project (Tetra Tech, Inc. 2021), modeling predicted that:

- Mobilized silt and clay sediment particles remain in suspension for about 4 hours after being mobilized in the water column.
- Coarser particles (fine sand) settle at a faster rate—about 1 minute after being mobilized.

In summary, literature indicates that lake/seabed deposits and water quality impacts from cable installation trenching operations remain generally localized and of short duration (AECOM, 2021). The prevalence of sandy sediment in most of the nearshore areas of the Project suggests that for most of the cable burial, most of any disturbed sediment would rapidly fall to the lakebed near the cable.

Articulated Pipe Cable Protection:

In certain situations, cable burial is not practical. In these cases, cables are protected using ductile cast iron articulated pipe (AP) surrounding the FOC (see figures in **Appendix A** and Photograph 16 in **Appendix B**). AP offers high strength and corrosion resistance and is used in areas where burial is not possible, such as boulder fields (Chicago shore landings) and shallow water (north of Beaver Island). AP can also be used for protection against mechanical damage such as anchor strikes or dragging.

Cable Crossing:

To cross the power cable located a few miles offshore of Charlevoix, a low impact cable crossing technique is planned. The current cable crossing design envisions the use of polyurethane half-shells cable protection (Photograph 17 in **Appendix B**). Polyurethane half-shells are a specialized, heavy-duty submarine cable protection system made from highly abrasion-resistant polyurethane.

The system comprises two cylindrical half shells which overlap and interlock to form close fitting protection around a cable. The half shells are manufactured in lengths of up to 2 meters (6.6 feet)

with flexing characteristics to suit the required minimum bend radius of the product. The half shells are secured in place using corrosion resistant banding located in recessed grooves to ensure a smooth external profile.

2.2. Alternatives Considered but Eliminated

Numerous routes were considered for IMPACC Projects 1 and 2 prior to proceeding with the chosen routes. These alternatives are discussed in detail in the following documents:

- Project 1 Alternatives Analysis presented in **Appendix E**
- Project 2 Alternatives Analysis presented in **Appendix F**.

A summary of these studies is presented below in Section 2.2.

In addition to evaluating Project alternatives referenced above, and in light of the overall IMPACC project purpose and NTIA MM Grant Program requirements, PFN considered the use of alternative communication technologies; however, based on project and program requirements, it was determined early on in the process that fiber installation was the most feasible technology to satisfy these requirements, and that alternative technologies such as wireless and satellite technologies were not viable alternatives. These alternative technologies were assessed relative to factors of technological feasibility (including subsea deployment), cost, environmental impact, geography, PFN's current network configuration, and the need for resiliency and redundancy with the IMPACC Project.

2.2.1. Shore Landing (Cable Landfall) Locations

Twenty-five shore landing alternatives were evaluated during Project 1 development. The locations are divided into four distinct areas associated with a necessary cable landfall vicinity:

- Benton Harbor, MI Area (4 alternatives)
- St, Joseph, MI Area (9 alternatives)
- Chicago, IL Area North (6 alternatives)
- Chicago, IL Area South (6 alternatives)

Eighteen cable landfall alternatives were evaluated during Project 2 development. The locations are also divided into four distinct areas associated with a necessary cable landfall vicinity:

- Seul Choix (Gulliver, MI) Area (4 alternatives)
- North Beaver Island, MI Area (4 alternatives)
- East Beaver Island, MI Area (6 alternatives)
- Charlevoix, MI Area (4 alternatives)

In the selection of shore landing alternatives, optimizing the combination of the submarine and terrestrial cable routes was a key priority. Other major considerations included the results of a near-shore marine hazards analysis, a geotechnical investigation, landing site geography, landlord interest, permitting requirements, and minimizing disruption to surrounding communities.

2.2.2. Submarine Cable Routing

Based on the location of the potential shore landing areas, an analysis of offshore routing constraints was conducted to identify potential submarine cable routes between the shore landings, to assess feasibility, and to understand the potentially significant challenges along each

route. In considering submarine cable routes between the shore landings, the most direct submarine cable route served as the starting point in developing the route. This was also driven by technical constraints and costs, including cable costs, installation time, and distance limits associated with non-repeated fiber optic transmission.

For Project 1, due to the relatively consistent and benign lake bottom conditions in southern Lake Michigan, the submarine cable routes for Project are as direct as possible once out of the nearshore area (see Overview Maps in **Appendix A**). The final Project 1 route and cable protection strategy decisions were informed by the marine cultural survey, an offshore hazards analysis, a near-shore marine hazard assessment, and the location of near-shore infrastructure. Near Benton Harbor, one of the shore landing locations was ruled out due to lack of landlord interest, and another was ruled out due to a steep embankment that would have hindered deployment. Near St. Joseph, it was determined that the size of the construction equipment would be too large for the existing roadway and therefore would have caused a significant disruption to the community.

For Project 2, the lake bottom in the northern portion of Lake Michigan is more complex and significant marine hazards are present. Therefore, several route alternatives were evaluated. Bathymetry datasets from National Oceanic and Atmospheric Administration (NOAA) and project-specific hydrographic and marine geophysical survey data were collected to analyze general lakebed conditions and specific lakebed-related risks along the potential submarine cable routes. These have allowed for routing to minimize traversing steep slopes, complex lakebed areas, and areas that exhibit natural risks such as areas of ice scour, sediment mobility, boulder fields, and anthropogenic risk such as anchorages, dredge spoils disposal areas, or dredged channels.

Project 2 preferred submarine route alternatives and cable protection strategy decisions were informed by the marine cultural survey, an offshore hazards analysis, a nearshore marine hazard assessment, and the location of nearshore infrastructure.

2.2.3. Terrestrial Cable Routing

The goal of the terrestrial cable alternatives analysis was to develop a constructible route that is largely sited within public ROWs and minimizes impacts on the environment and the public. Terrestrial cable route alternatives are limited to routes starting at practicable cable landfall alternatives, passing through the required unserved and underserved areas, connecting with anchor institutions, and ending at the points of interconnection (POI) with the existing fiber optic network.

Similar to the Proposed Action, the alternative terrestrial cable routes would also primarily follow existing road ROWs, which are previously disturbed areas due to road construction, routine vegetation and tree clearing, and routine maintenance. In more heavily populated areas or where sensitive resources exist, installation of the FOC would occur via HDD. In more rural areas where there are fewer underground utilities, the FOC would be placed with a combination of vibratory plowing in HDPE conduit along with HDD installation where necessary.

2.2.3.1. Project 1

During the planning phases and initial network design for Project 1, terrestrial route alternatives were developed and evaluated in two different areas:

- Byron Center, MI to St. Joseph/Benton Harbor, MI
- Chicago, IL

Byron Center, MI to St. Joseph/Benton Harbor, MI

The Byron Center, MI to St. Joseph/Benton Harbor, MI route was designed to extend to unserved and underserved areas and provide required connections to community anchor institutions within these areas in accordance with the objectives of the MM Grant Program.

Once an initial route was developed to best meet the Project requirements, desktop and field surveys were conducted to identify and characterize ecological and cultural resources. Field reconnaissance, which included critical habitat and species presence/absence surveys and wetland delineations, were conducted along the terrestrial cable route. In addition, in coordination with Michigan State Historical Preservation Office (SHPO), cultural desktop and field surveys were conducted to identify cultural resources along the proposed route. Once biological and cultural resources were identified, minor route changes (changing sides of the road/micro re-routes) were implemented to reduce the environmental and cultural impact of the Project while still meeting the Project objectives.

The potential use of existing fiber conduit in this area also informed routing decisions. The use of existing conduit was maximized to minimize impacts and reduce costs. Areas where existing conduit would be used along the terrestrial routes are depicted in the overview maps in **Appendix A**.

Chicago, IL

The two Chicago route alternatives were controlled by the location of shore landings acceptable to the City of Chicago Park District, the location of the City of Chicago Freight Tunnel system, existing buildings, roads and other Chicago infrastructure/resources, as well as POIs with Data Centers.

Chicago area routes were optimized to avoid existing infrastructure, reduce impact to City of Chicago assets, and utilize pre-existing fiber optic infrastructure wherever available.

2.2.3.2. Project 2

During the planning phases and initial network design for Project 2, terrestrial route alternatives were developed and evaluated in three different areas:

- Southern UP between the existing PFN Network to the Lake Michigan Shoreline
- Beaver Island, MI
- Charlevoix, MI to Gaylord, MI

Southern Upper Peninsula

Several terrestrial routes along the existing fiber optic network along the southern shore of the UP were evaluated. The existing PFN network extends along US-2 in the eastern UP and was used as the POI for terrestrial route alternatives.

Terrestrial routes (associated with shore landing alternatives) were evaluated near:

- Naubinway, MI;
- Epoufette, MI; and,
- Seul Choix/Gulliver, MI Area.

The Naubinway, MI and Epoufette, MI shore landing locations were considered but not pursued because these locations would require a longer cable route and higher cable deployment costs without providing a tangible benefit to the Project. Additionally, the Lake

Michigan lakebed south of these areas (which was avoided by PFN) is very complex and contains many hazards, such as significant shoaling, high slope areas, and ice scour.

Beaver Island, MI

Four route options on Beaver Island were identified and evaluated after consultation with the Beaver Island Broadband Task Force, Township Supervisors, Charlevoix County, and Central Michigan University's (CMU) Biological Station.

Terrestrial cable route alternatives are bound by the shore landing locations and existing fiber optic network POIs. To minimize impacts on the environment and the public, the terrestrial cable route alternatives primarily follow existing road ROWs, which are previously disturbed areas due to road construction and routine vegetation and tree clearing. Route alternatives were also guided by the presence of existing conduit and active development plans. On Beaver Island, the cost of the easements, impacts to species and habitats, water depth, geotechnical soil data, and navigation of water features were considered and resulted in ruling out three of the alternative routes in favor of the Proposed Action Alternative, which utilizes existing conduit to the extent practicable.

Charlevoix, MI to Gaylord, MI

The Charlevoix, MI to Gaylord, MI route was designed to extend to unserved and underserved areas and provide required connections to community anchor institutions within these areas in accordance with the objectives of the MM Grant Program.

Once an initial route was developed to best meet the Project requirements, desktop and field surveys were conducted to identify and characterize ecological and cultural resources. Field reconnaissance, which included critical habitat and species presence/absence surveys and wetland delineations, were conducted along the terrestrial cable route. In addition, in coordination with the Michigan SHPO, cultural desktop and field surveys were conducted to identify cultural resources along the proposed route. Once these biological and cultural resources were identified, minor route changes (changing sides of the road/micro re-routes) and the utilization of a short segment of existing conduit were implemented to reduce the environmental and cultural impact of the Project while still meeting the Project requirements.

2.3. No Action Alternative

Under the No Action Alternative, the IMPACC Project would not be constructed and the environmental effects described in Section 3 would not occur. Under the No Action alternative, the Project purpose and need would not be met, and unserved and underserved areas would remain without adequate broadband access. Counties, towns and villages along the Project 1 and 2 routes would continue to have diminished access to telehealth, remote learning, remote work, public services, emergency services, and economic opportunities. High-speed internet connections for students, and for those who work from home, would remain below standard connectivity speeds (100 megabits per second [Mbps] for downloads and 20 Mbps for uploads). Furthermore, several of these counties, towns, and villages are at or below the poverty level, particularly along the Project 1 corridor. No Action perpetuates a disadvantage for economic development, community growth, and housing and business development in these areas that middle mile infrastructure and subsequent high-speed internet connectivity would otherwise bring to these unserved and underserved communities.

3. Affected Environment and Environmental Effects

This section analyzes the affected environment and the potential environmental effects of the Proposed Action and No Action Alternative. The Central Region PEIS identified potential environmental effects on the natural and human environment that would result from the implementation of broadband deployment as well as specific BMPs and mitigation measures that would avoid or minimize such effects. NTIA and PFN have reviewed the Central Region PEIS and determined that the PEIS includes detailed analyses for all applicable environmental areas of concern (resource areas) for projects in Michigan and Illinois. PFN has also reviewed, and commits to adhere to, the resource area-specific BMPs identified in Chapter 19, Best Management Practices and Mitigation Measures, of the Central Region PEIS.

The EA evaluates the Proposed Action and No Action Alternative for one category of potential effects:

- No or less than significant (e.g., moderate, minor, or *de minimis*) effects. Central Region PEIS BMPs would be incorporated and adhered to, as applicable.

Table 3.1. analyzes the potential environmental effects of the Proposed Action under all relevant resource areas. The Affected Environment column summarizes the resource areas discussed in the state-specific PEIS applicable to the Project, supplemented as appropriate with site-specific information and data. The Environmental Effects column includes a statement of potential effects for each resource area, accounting for incorporation of the PEIS BMPs and any additional BMPs where appropriate.

Table 3.2. compares the effects of the No Action Alternative to the Project.

Table 3.1. Affected Environment and Environmental Effects of the Proposed Action

Resource Area	Affected Environment	Environmental Effects
Infrastructure	Infrastructure along the project generally consists of multi-lane state and federal highways, county and local roads, and railroad tracks. Project 1 would cross or be immediately adjacent to surface transportation routes, including but not limited to Clyde Park Avenue, 142nd Avenue, 24th Street, 128th Avenue, Dumont Lake Road, Lincoln Road, State Highway 8, 52nd Street, Hill Avenue, Carmody Road, and Red Arrow Highway. In addition, Project 1 would cross or be immediately adjacent to aerial utilities, buried utilities, and railroad tracks. Project 2 would cross or be immediately adjacent to surface transportation routes, including but not limited to Interstate 75, State Highway 32, State Highway 131, State Highway 88, State Highway 65, State Highway 31, Kings Highway, State Highway 432, and U.S. Bicycle Route 10. In addition, Project 2 would cross or be immediately adjacent to aerial utilities, buried utilities, the Charlevoix Municipal Airport, and railroad tracks.	Consistent with Section 8.2.1 and Table 8.2.1-1 of the Michigan chapter and Section 4.2.1 and Table 4.2.1-1 of the Illinois chapter of the Central Region PEIS, there would be less than significant effects on infrastructure. Installation would occur within ROWs via underground plowing. HDD would be used at specific locations as an alternative installation method to bypass surface obstacles such as roads, railroads, or existing utilities. There would be minimal to no adverse effect on utility service levels and any effects would be limited in time and location. Standard BMPs and mitigation measures in Chapter 19 of the PEIS would be incorporated and adhered to as applicable. Potential effects on traffic patterns during construction would be reduced with implementation of a Traffic Mitigation Plan (see **Appendix G**).
Soils	The Natural Resources Conservation Service (NRCS) defines three Land Resource Regions (LRRs) in Michigan. Project 1 is within the Lake State Fruit, Truck Crop, and Dairy Region; and Project 2 is within the Lake State Fruit, Truck Crop, and Dairy Region and the Northern Lake States Forest and Forge Region (FirstNet 2017). Within and among Michigan's three LRRs are Major Land Resource Areas (MLRA), which are characterized by patterns of soils, climate, water resources, land uses, and type of farming. Project 1 is within the Michigan Eastern Upper Peninsula Sandy Drift, and Project 2 is within the Northern Highland Sandy Drift MLRA, Northern Michigan and Wisconsin Sandy Drift MLRA, and Erie-Huron Lake Plain	Consistent with Section 8.2.2 and Table 8.2.2-1 of the Michigan chapter and Section 4.2.2 and Table 4.2.2-1 of the Illinois chapter of the Central Region PEIS, there would be less-than-significant effects on soils. There would be minimal to no adverse effects on soils due to erosion, topsoil mixing, or perceptible soil compaction. Any adverse effects on soils during construction of the terrestrial portions of Projects 1 and 2 would be limited and temporary, generally occurring in roadway rights-of-way, and prior conditions would be restored once construction has been completed. For the Project 1 and 2 marine routes, cable would be laid directly on the lakebed surface, or in certain areas, the fiber cable may need to be buried beneath the lakebed. Surface laying of the cable would mobilize very low quantities of sediment as the only disturbance is cable

Resource Area	Affected Environment	Environmental Effects
	(FirstNet 2017). **Table 3.1.1.** below identifies the MRLA and soil characteristics. Based on a review of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO), the terrestrial portion of the Project 1 route would cross 184 soil series in Michigan and four soil series in Illinois (NRCS 2025). The terrestrial portion of the Project 2 route would cross 119 soil series (NRCS 2025). **Appendix H** provides a summary of soil compaction, topsoil mixing, and erosion potential for each soil series. There are no prime or unique farmlands within the Proposed Action area. Lake Michigan's lakebed consists of unconsolidated, loose sediments, primarily sandy and silt materials, lying over a base of semi consolidated clay and bedrock. The thickness of these sandy sediments varies, but they can extend several meters deep before reaching older, denser clay and bedrock layers (Data Basin 2011).	touchdown on the lakebed. Cable burial would temporarily suspend sediment that would be redeposited in the vicinity of the cable alignment. Coarser sediments are expected to settle in minutes within a few meters of the cable route following disturbance. Finer sediments are expected to settle in hours. Therefore, construction of the Project 1 and 2 marine routes would have less-than-significant effects on lakebed soils.

Table 3.1.2. Proposed Action - Soil Characteristics of MLRAs in the Project Area

MLRA	Soil Characteristics
Project 1	
Michigan Eastern Upper Peninsula Sandy Drift	Alfisols, Entisols, Histosols, and Spodosols are the dominant soil orders. These clayey to sandy soils range from very poorly drained to excessively drained. They range from shallow to very deep.
Project 2	
Northern Highland Sandy Drift	Histosols and Spodosols are the dominant soil orders. These mucky, sandy, or loamy soils range from very poorly drained to excessively drained and are very deep.
Northern Michigan and Wisconsin Sandy Drift	Alfisols, Entisols, Histosols, and Spodosols are the dominant soil orders. These sandy and very deep soils range from poorly drained to excessively drained.
Erie-Huron Lake Plain	Alfisols, Inceptisols, Mollisols, and Spodosols are the dominant soil orders. These clayey or loamy soils are typically poorly drained to somewhat poorly drained and are very deep.

Source: FirstNet 2017

Resource Area	Affected Environment	Environmental Effects
Geology	Projects 1 and 2 would be in the Central Lowland of the Interior Plains (First Net 2017). Bedrock in the Central Lowland Province consists of sedimentary deposits overlain by glacial till. The bedrock underlying northern Lake Michigan consists primarily of 400-million-year-old Devonian limestones and Silurian dolomites, which contain the fossilized coral that forms Petoskey stones and Charlevoix stones. This bedrock was formed in an ancient sea and later shaped by glaciation, which carved out the lake basin and deposited sediments. Projects 1 and 2 and their immediate vicinities are at low risk for earthquakes, landslides, and land subsidence (First Net 2017). However, portions of Project 2 in Schoolcraft County and Beaver Island consist of carbonate karst topography[3], and these areas have a higher susceptibility to subsidence (FirstNet 2017). The Proposed Action is not in the vicinity of known sites with extensive fossils within the state (FirstNet 2017).	Consistent with Section 8.2.3 and Table 8.2.3-1 of the Michigan chapter and Section 4.2.3 and Table 4.2.3-1 of the Illinois chapter of the Central Region PEIS, there would be less than significant effects. Projects 1 and 2 and their immediate vicinities are at low risk for earthquakes, landslides, and land subsidence. In addition, locations with karst topography would be avoided during construction. The footprint of the Project 1 and 2 terrestrial and marine routes would not affect, or be affected by, areas with geologic hazards.

[3] Karst is defined as a distinctive landscape (topography) that can develop where the underlying bedrock, often limestone or marble, is partially dissolved by surface or groundwater.

Resource Area	Affected Environment	Environmental Effects
Water Resources	<u>Waterbodies</u> Projects 1 and 2 cross Lake Michigan as well as several types of waterbody features including perennial and intermittent streams/rivers, canals/ditches, and artificial paths (GEI Consultants 2025a, 2025b) (**Appendix I**). No ephemeral waterbodies were classified within the Proposed Action areas for Projects 1 and 2 (GEI Consultants 2025a, 2025b). There are no Wild and Scenic Rivers or state-designated high quality and exceptional value waters in the Proposed Action area (FirstNet 2017). The terrestrial route of Project 1 intersects two waterbody boundaries that are classified as lakes/ponds. However, the project is entirely within the road shoulder directly adjacent to the lake and pond and does not actually cross these waterbodies. The Project 2 terrestrial route does not cross any waterbodies that are classified as lakes or ponds (GEI Consultants 2025a, 2025b). This is in addition to the main crossings of Lake Michigan, which both Projects 1 and 2 would cross. Based on review of the USGS National Hydrography Dataset (NHD), the Project is within Northeastern Lake Michigan (USGS 2025a). The Project 1 terrestrial route has 73 waterbody crossings, and the Project 2 terrestrial route has 35 waterbody crossings (GEI Consultants 2025a, 2025b). The waterbody identification number and waterbody name, type, bank width, depth, and annual mean flow are provided in the 2025 Wetland Delineation Reports completed by GEI for Projects 1 and 2 (**Appendix J**). None of these waterbodies are classified as impaired under Section 303(d) of the Clean Water Act (Michigan Department of Environment, Great Lakes, and Energy 2024). Wetlands are discussed separately below. No waterbodies other than Lake Michigan would be crossed in Illinois (GEI Consultants 2025c). Impacts on the bed of Lake Michigan would result from the	Consistent with Section 8.2.4 and Table 8.2.4-1 of the Michigan chapter of the Central Region PEIS, there would be less than significant effects on water resources. Surface water resources would be fully avoided and protected through directional drilling. In addition, an Inadvertent Release (Frac-Out) Plan (**Appendix K**) has been prepared to include the procedures and responsibilities for preventing, detecting, containing, and cleaning up frac-outs during directional drilling operations. <u>Waterbodies</u> Waterbodies, not including Lake Michigan, are crossed with the use of HDD methods with a minimum of 10 feet to be maintained from the top of the conduit to the bottom of the stream bed. HDD entry and exit bore pits would be located outside of the banks of waterbodies and would not impact the banks. There are a few instances where the FOC would be buried along the road shoulder where it crosses over the top of a culverted waterbody. However, no impacts would occur to the waterbody by crossing the waterbody by this method. An Inadvertent Release (Frac-Out) Plan has been prepared to include the procedures and responsibilities for preventing, detecting, containing, and cleaning up frac-outs during directional drilling operations. If this occurs in waterbodies, an after-the-fact permit would be obtained. <u>Floodplains</u> Within floodplains, the FOC would be installed 4 feet below grade using HDD methods and therefore there are no surface area impacts above ground. Impacts to floodplains associated with HDD bore pits are considered temporary and there would be no change in grade to the existing conditions of the floodplain. The handholes are installed so that the top of the structure is at, or near, the existing ground surface within the floodplain. Excavated material that is not used as backfill would be removed from the site, and

Resource Area	Affected Environment	Environmental Effects
	installation of the fiber line along the lakebed. The temporary impacts are summarized in **Table 3.1.2.** and the permanent impacts are summarized in **Table 3.1.3**. **Appendix L** provides the full summary of lakebed effects. <u>Floodplains</u> Project 1 and 2 cross areas that have been mapped by the Federal Emergency Management Agency (FEMA) as 1% Annual Chance Flood Hazard and 2% Annual Chance Flood Hazard areas (GEI Consultants 2025a, 2025b). Project 1 also crosses areas designated as Regulatory Floodways (GEI Consultants 2025a). Project 1 terrestrial FOC would cross 1.3 miles (6,679.6 feet) of FEMA Zone A and Zone AE floodplains that are not associated with Lake Michigan (GEI Consultants 2025a). Project 1 would also cross regulatory floodplains[4] that are associated with Lake Michigan near the landing sites. There are 19 bore pits used for the HDD entry/exit points that are in or near a regulated floodplain that has the potential to temporarily impact a 4' x 4' area of floodplain. HDD bore pits in the floodplain would be excavated and then restored to pre-existing conditions once the cable is installed. There are 13 handholes that are planned to be installed within Zone A or Zone AE floodplain. Each of the handhole structures are 2 ft. x 3 ft. and installed to a depth of 2 ft. Like the bore pits, these handholes would be installed using open trench or excavation methods that would be promptly backfilled around the handhole and restored. The Project 1 terrestrial route does not intersect FEMA floodplains in Illinois (GEI Consultants 2025c). Project 2 would cross a regulated FEMA Zone AE Floodplain.	there would be no change to the ground surface elevation, and no above grade structure would remain in the floodplain from the installation of the handholes. There would be no permanent impacts to flood storage and no permanent surface area impacts above ground within the floodplain, therefore the installation of in-ground fiber would have no effects on, nor would it be subject to impacts from, floodplains. <u>Lake Michigan</u> Installation of the fiber-optic cable is considered less than significant as it would result in limited, temporary impacts to the bed of Lake Michigan, primarily from surface placement of the cable, with permanent fill restricted to the cable and HDD casing at shore approaches which is also less than significant. Extensive hydrographic, geophysical, sediment, and maritime archaeological studies informed route selection to avoid sensitive resources. Cable routes and landing sites were selected to minimize disturbance by using the most direct path and surface-lay installation techniques, with burial limited to nearshore areas using low-impact methods. Installation activities would be continuously monitored to limit sediment disturbance, and an Inadvertent Release (Frac-Out) Plan would guide prevention and response measures during HDD operations.

[4] A Regulatory Floodway means the watercourse and adjacent land areas must be reserved to discharge base flow levels that do not increase the water surface elevation more than a designated height. Communities regulate development on these floodways so there is no increase in flood elevation.

Resource Area	Affected Environment	Environmental Effects
	The floodplain is associated with Lake Michigan near the Charlevoix landing site. The fiberoptic cable would be installed 4 feet below grade using HDD methods (GEI Consultants 2025b). <u>Water Quality</u> The U.S. EPA summarizes water quality conditions in Lake Michigan according to reporting requirements under Section 303(d) of the Clean Water Act. The water quality data is compared to water quality goals to determine the suitability of waters for specific uses, including aquatic life, recreation, human health impacts related to fish tissue contamination, and public drinking water supplies. Lake Michigan is currently considered impaired due to atmospheric deposition of toxins affecting fish tissue. These toxins include Dichlorodiphenyltrichloroethane (DDT), dioxins, mercury, and perfluorooctan sulfonate (U.S. Environmental Protection Agency 2025). The Proposed Action would not cross sole source aquifers or other significant groundwater resources (FirstNet 2017).	

Table 3.1.3. Proposed Action - Temporary Impacts on Lake Michigan

Installation Method	Distance (Mile)	Lakebed Impacts (Acres)
Project 1 (Michigan and Illinois)		
Cable Plow	0.75	1.81
HDD Borehole	1.68	0.22
Total Temporary Impacts	**2.43**	**2.03**
Project 2		
Cable Plow	3.43	8.31
HDD Borehole	2.05	0.27

Installation Method	Distance (Mile)	Lakebed Impacts (Acres)
Total Temporary Impacts	**5.47**	**8.58**

Source: GEI Consultants 2025a, 2025b

Table 3.1.4. Proposed Action - Permanent Impacts on Lake Michigan

Installation Method	Distance (Mile)	Lakebed Impacts (Acres)
Project 1 (Michigan and Illinois)		
Plowed Cable	0.75	0.01
Surface Lay	118.23	1.51
HDD Casing	1.68	0.10
Articulated Pipe	0.84	.052
Total Permanent Impacts	**121.5**	**1.67**
Project 2		
Plowed Cable	3.43	0.05
Surface Lay	48.05	0.61
HDD Casing	2.05	0.12
Articulated Pipe	0.16	0.1
Total Permanent Impacts	**53.69**	**0.88**

Source: GEI Consultants 2025a, 2025b

Resource Area	Affected Environment	Environmental Effects
Wetlands	Several areas of the Proposed Action for Projects 1 and 2 are in or adjacent to forested, emergent, and scrub shrub wetlands. For Project 1, wetlands are more prevalent in the central portion of the route within Allegan and Van Buren counties (GEI Consultants 2025a). For Project 2, wetlands are more abundant and larger in the northern portion of the route within Charlevoix and Schoolcraft counties (GEI Consultants 2025b). For both Projects 1 and 2, the forested wetlands were most abundant, followed by emergent, followed by scrub shrub (GEI Consultants 2025a, 2025b). Based on a review of the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and Michigan Department of Natural Resources' Michigan Resource Inventory System (MIRIS), the Proposed Action would be in, or adjacent to, wetlands classified under the national Wetlands Classification Standard (WCS). Wetland delineations for Project 1 and Project 2 were conducted following the USACE procedure for identifying wetland boundaries by completing the appropriate number of sampling points, investigating the required wetland criteria, and identifying the boundary between wetland and upland areas. For the Michigan portion of Project 1, 341 wetlands were delineated covering 208.4 acres within the approximate 4,660-acre Area of Investigation[5] comprising 4.6 percent of the total land area. The wetlands were classified into three main types: forested, emergent, and scrub shrub. The forested wetland type was the most prevalent at 133.82 acres followed by emergent wetland at 46.84 acres and scrub shrub wetlands at 27.74 acres (**Table 3.1.4.**). Some of the emergent wetlands consisted of formerly forested wetlands that were previously	Consistent with Section 8.2.5 and Table 8.2.5-1 of the Michigan chapter of the Central Region PEIS, there would be less than significant effects on wetlands. Wetlands being impacted by the permanent installation of the fiber line were determined to be lower quality wetlands due to having already been impaired and impacted by the existing rights-of-ways. Presence of invasive species, periodic routine maintenance for vegetation management activities, and road maintenance projects all contributed to the factors that reduced the quality of these features. Additionally, potential temporary effects on wetlands may be reversed over 1-2 growing seasons. Standard BMPs in Chapter 19 of the PEIS would also be implemented, as applicable, to further minimize and avoid effects on wetlands. <u>Permanent Impacts:</u> Although the fiber cable would be installed below the surface of the wetland and would not result in wetland loss, its permanent placement is considered a permanent impact due to the structural fill associated with the fiber optic cable. In addition, several bore pits would be located in or near wetland boundaries. <u>Temporary Impacts:</u> The equipment used for the plow installation method measures approximately 7.75 feet in width, which would result in temporary wetland impacts associated with the equipment's access through wetland areas during cable installation. There are 39 HDD bore pits for Project 1 and there are 67 HDD bore entry/exit pits associated with Project 2 that are in or within 15 feet of a wetland boundary. The bore pits have the potential to temporarily impact a 4' x 4' area of wetland. The HDD bore pits in the wetland would be excavated and then restored to pre-work conditions once the cable is installed. Therefore, the impacts associated with HDD bore pits

[5] The Project Area of Investigation represents the total area evaluated for the wetland delineation, including the proposed fiber installation location, a 300-foot-wide buffer zone that extends 150 feet outward from the fiber line location, and the shoreline landing areas.

Resource Area	Affected Environment	Environmental Effects
	cleared of trees and received periodic vegetation maintenance to limit tree and shrub growth within the existing right-of-way. There are 4.36 miles (23,010 feet) in total where the fiber line crosses wetlands; however, 11,373 feet are crossed through existing conduits, where no new impacts would occur (**Table 3.1.5.**). The primary area of Project 1 that uses existing conduit is in Allegan County. No wetlands were identified in the Illinois portion of Project 1 (GEI Consultants 2025c). **Appendix J** provides the wetland delineation report for Project 1. The Project 2 wetland delineation determined that wetlands are more abundant and larger in the northern portion of the Project 2 corridor within Charlevoix and Schoolcraft counties. Two hundred and ninety-seven wetlands were delineated covering 310.7 acres within the approximately 3,308.5-acre Area of Investigation comprising 9.4 percent of the total land area (**Table 3.1.4.**). The wetlands were classified into three main types: forested, emergent, and scrub shrub. The forested wetland type was the most prevalent at 237.6 acres followed by emergent wetland at 44.5 acres and scrub shrub wetlands at 28.6 acres (**Table 3.1.4.**). Some of the emergent wetlands consisted of formerly forested wetlands that were previously cleared of trees and received periodic vegetation maintenance to limit tree and shrub growth within the existing right-of-way. There are 4.32 miles (22,787 feet) in total where the fiber line crosses wetlands (**Table 3.1.5.**). **Appendix J** provides the wetland delineation report for Project 2.	are considered temporary. In addition to the HDD bore pits, both projects have handholes that would be installed within, or near (less than 15 feet), the wetland boundaries. Project 1 has 22 handholes within or near wetland boundaries, while Project 2 has 6. These handholes are expected to result in permanent wetland impacts from installation. Each handhole structure is 3 feet x 4 feet and is installed to a depth of 3.5 feet. Handholes are installed within the HDD Entry/Exit Bore Pit whenever possible, which requires a slightly larger excavation area than that required for the bore pit. The bore pit excavation would be 4 feet by 4 feet and the handhole would require an excavation of 4 feet by 6 feet. Therefore, the handholes being installed within the bore pit in a wetland area would require an extra 8 square feet of excavation. A total of 14 handholes (12 for Project 1 and 2 for Project 2) impacting wetlands are not associated with HDD Entry/Exit Bore Pits. The excavation area for the handholes not associated with an HDD Entry/Exit Bore Pit would temporarily disturb a 6' x 4' area (24 square feet), and the excavation would be to a depth of 3.5 feet. Like the bore pits, these handholes would be installed using open trench or excavation methods that would be promptly backfilled around the handhole and restored. The total temporary and permanent impacts from the handholes are included in **Table 3.1.6**. **Table 3.1.6.** shows the linear feet and acreage of temporary and permanent wetland impacts by installation method. As shown in **Table 3.1.6.**, approximately 2 acres of wetlands would be temporarily affected during construction, and 0.07 acres would be permanently affected from installation of the fiber optic cable. No wetlands would be affected by any of the staging areas or hut sites. **Appendix L** provides the full summary of impacts. There are no wetlands adjacent to Section 10 Waters that are impacted by this project; therefore, wetland impacts are regulated by EGLE under Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act 1994 PA 451, as

Resource Area	Affected Environment	Environmental Effects
		amended (NREPA). One wetland adjacent to a Section 10 water is crossed by the project via existing conduit, so no new impacts or construction would occur. An EGLE Part 303 permit application was submitted for wetland impacts from the HDD bore pits and handholes. There are no wetland impacts from staging areas, laydown areas, or hut sites. The wetland impacts from the fiber cable installation are covered under the 303 Utility Exemption and are provided for informational purposes only. The exemption includes the installation of utility lines having a diameter of six inches or less using directional drilling or boring, or knifing-in, where the top of the utility line is at least 4 feet below the soil surface of the wetland (when bored via HDD) and following the EGLE Suggested Best Management Practices for Utility Corridor Projects that Cross Wetlands. Lastly, there would be no effects on high quality or special value wetlands from the Proposed Action.

Table 3.1.5. Proposed Action - Wetland Acres Categorized by Type

Wetland Type	Acreage
Project 1	
Forested Wetland	133.82
Emergent Wetland	46.84
Scrub Shrub Wetland	27.74
Total	**208.4**
Project 2	
Forested Wetland	237.6
Emergent Wetland	44.5

Wetland Type	Acreage
Scrub Shrub Wetland	28.6
Total	**310.7**

Source: GEI Consultants 2025a, 2025b

Table 3.1.6. Proposed Action - Wetland Impact in Linear Feet within the Fiber Route

Installation Method	Wetland Impacts (Linear feet)
Project 1	
Plow Installation Methods	463
Bore (HDD) Installation Methods	11,174
Total	**11,637**
Project 2	
Plow Installation Methods	12,245
Bore (HDD) Installation Methods	10,542
Total	**22,787**

Source: GEI Consultants 2025a, 2025b

Table 3.1.7. Proposed Action - Temporary and Permanent Wetland Impacts from Terrestrial Route Fiber Line Installation

Installation Method	Linear Feet Installed in Wetlands	Wetland Impacts (Acres)
Project 1		
Plow Installation (Temporary Impacts)	463	0.08
HDD Bore Pits (Temporary impacts)	-	0.014
Handholes (Temporary impacts)	-	0.007
Handholes	-	0.018

Installation Method	Linear Feet Installed in Wetlands	Wetland Impacts (Acres)
(Permanent impacts)		
Plow Cable (Permanent Impacts)	463	0.001
Bore/HDD Cable (Permanent Impacts)	11,174	0.03
Total Temporary Impacts	**463**	**0.101**
Total Permanent Impacts	**11,637**	**0.049**
Project 2		
Plow Installation (Temporary Impacts)	12,245	2.2
HDD Bore Pits (Temporary impacts)	-	0.025
Handholes (Temporary impacts)	-	0.001
Handholes (Permanent impacts)	-	0.005
Plow Cable (Permanent Impacts)	12,245	0.04
Bore/HDD Cable (Permanent Impacts)	10,542	0.03
Total Temporary Impacts	**12,245**	**2.231**
Total Permanent Impacts	**22,787**	**0.076**

Source: GEI Consultants 2025a, b

Resource Area	Affected Environment	Environmental Effects
Biological Resources	Biological resources include terrestrial vegetation, terrestrial and aquatic habitats, fisheries, wildlife, threatened and endangered species, critical habitats, and species of conservation concern. Vegetation within and in the immediate vicinity of Projects 1 and 2 includes forested wetlands, emergent wetlands, shrub-scrub wetlands, mesic forests, and surrogate grasslands. The Proposed Action areas include wildlife consisting of mammals, birds, reptiles, amphibians, insects, and aquatic species. Projects 1 and 2 are also located within the range of several protected species, including federally endangered and state endangered, threatened, and special concern species. <u>Vegetation</u> Project 1 occurs within the Central Corn Belt Plains and Southern Michigan/Northern Indiana Drift Plains U.S. Environmental Protection Agency (USEPA) Level III ecoregions. Vegetation within Project 1 and the immediate vicinity includes forested wetlands, emergent wetlands, shrub-scrub wetlands, mesic forests, and surrogate grasslands. Community types within Project 1 along the transportation and utility corridors are often dominated by or have invasive species such as reed canary grass and glossy buckthorn. Project 2 occurs within the Northern Lakes and Forests and North Central Hardwood Forests USEPA Level III ecoregions. Vegetation within Project 2 and the immediate vicinity includes forested wetlands, shrub scrub wetlands, emergent wetlands, mesic northern forests, and surrogate grasslands. Due to the extensive linear nature and scale of the projects, precise acreage impacts for each vegetation community cannot be reliably quantified based on the field data collected. The projects primarily occur within	Consistent with Section 8.2.6 and Table 8.2.6-1 of the Michigan chapter of the Central Region PEIS and based on the Biological Assessment completed for these projects, there would be less than significant effects on vegetation, wildlife, and fisheries. Adherence to the standard BMPs and mitigation measures in Chapter 19 of the PEIS would be implemented to further minimize and avoid effects on biological resources; however, project activities may result in adverse effects on the dwarf lake iris, a federally listed threatened species, as determined through consultation with the USFWS. Effects on these resources would be localized and predominantly temporary; permanent effects would be limited to the loss of dwarf lake iris individuals and occupied habitat within the construction footprint. Approximately 14,999 square feet (0.34 acres) of occupied dwarf lake iris habitat would be permanently affected as a result of project construction. Although these effects cannot be reduced to insignificant or discountable levels, no population or sub-population effects would occur, given the localized nature of impacts, avoidance and minimization measures incorporated into project design, and the presence of large dwarf lake iris populations adjacent to and outside of the project footprint. Consistent with Section 8.2.6 and Table 8.2.6-1 of the Michigan chapter of the Central Region PEIS, Project 1 may affect, but would not be likely to adversely affect, ten federally listed species, based on adherence to agency-identified construction windows. Project 1 would have no effect on the remaining four federally listed species, as they are not present at the Project site. See **Appendix M** for species-specific determinations pending USFWS concurrence with the "not likely to adversely affect" determinations. There are no critical habitats within the Project 1 project area. Consistent with Section 8.2.6 and Table 8.2.6-1 of the Michigan chapter of the Central Region PEIS, Project 2 may affect, but is not likely to adversely affect, eight proposed and federally listed species. Effects on these species would be less than significant due to the

	previously disturbed rights-of-way, and impacts on natural vegetation communities are expected to be minimal and localized. Wildlife and Fisheries General wildlife includes mammals, birds (including migratory birds protected under the MBTA), reptiles, amphibians, insects, and aquatic species typical of the region's habitats. Bald and golden eagles are present and protected under the Bald and Golden Eagle Protection Act. No Essential Fish Habitat or Habitat Areas of Particular Concern were identified within the project areas. General habitat for migratory birds covered under the Migratory Bird Treaty Act (MBTA) is present within the Project footprints. Threatened and Endangered Species and Critical Habitat Based on a review of the USFWS IPaC Official Species List (OSL), Project 1 is located within the range of fourteen proposed, listed, and experimental population species outlined in **Table 3.1.7**. Based on the USFWS IPaC OSL, Project 2 is located within the range of fifteen proposed and listed species outlined in **Table 3.1.8**. Critical habitat for federally listed species is not present in or immediately adjacent to the Project footprints. IPaC Consultation Codes (**Appendix C**): • Project 1 Bryon Center to Benton Harbor – IPaC Project Code: 2025-0138806 • Project 1 Maritime IL – IPaC Project Code: 2025-0136689 • Project 2 – IPaC Project Code: 2025-0101803. State Agency Wildlife Consultations (**Appendix N)** • Project 1: Illinois Department of Natural Resources Records of the state-listed Mudpuppy (*Necturus maculosus*) exist in the project vicinity. These amphibians move closer to the Lake Michigan shore in winter and can be found in cracks and crevices	limited, temporary, and localized nature of anticipated disturbances and agency-identified avoidance, minimization, and seasonal construction measures that would be implemented to further minimize potential effects. Project 2 may affect and is likely to adversely affect one federally listed species, the dwarf lake iris (*Iris lacustris*). NTIA initiated formal consultation with the USFWS on February 6, 2026; consultation is ongoing. Project 2 would have no effect on Houghton's goldenrod, Hungerford's crawling water beetle, lakeside daisy, Michigan monkey-flower, and Pitcher's thistle, as they are not present within the Project area. Project 2 would have no effect on rufa red knot based on the USFSW Michigan Determination Key. See **Appendix M** for species-specific determinations pending USFWS concurrence with the "not likely to adversely affect" determinations as well as the "may affect and likely to adversely affect" determination for the dwarf lake iris. There are no critical habitats for Project 2. State agencies have been consulted, and no communities of concern were identified within the project sites based on available data and field assessments, except for occurrences of dwarf lake iris within Project 2, which are addressed separately in the Environmental Effects section and through Section 7 consultation. Bald and golden eagles may occur within or near the project areas; however, suitable nesting or roosting habitat is limited within the project footprints due to the predominantly linear, disturbed nature of the rights-of-way. Project activities may result in short-term disturbance to individual eagles during construction, primarily related to noise and human activity. These effects would be temporary and localized. No removal of known eagle nests or roost sites is anticipated, and project activities are not expected to result in injury or mortality of bald or golden eagles. As a result, effects on bald and golden eagles are anticipated to be less than significant. Standard construction BMPs, including limiting the duration of disturbance and avoiding unnecessary vegetation clearing, would be implemented to further minimize potential disturbance. No mitigation measures are required to maintain effects below the level of significance. General habitat for migratory birds protected under the Migratory Bird Treaty Act occurs within the project footprints, particularly within

	around human-made structures. The project proponent has indicated that the FOC installation nearshore would not involve burial into the lakebed, and that a 10-meter buffer from human-made structures on the lake bottom would be maintained during cable placement (with the exception that HDD may pass beneath shoreline riprap at less than 10 meters depth). Furthermore, HDD operations for the Chicago shore landings are anticipated to occur in late spring through summer 2026. The Short-eared owl (*Asio flammeus*) and Mottled sculpin (*Cottus bairdii*) were identified within proximity to the project area. • Project 1 Maritime IL – IL DNR EcoCAT Reviews (**Appendix N**): #2602408 & #2602411	roadside vegetation, wetlands, and forested edges. Project construction may result in temporary disturbance to migratory birds and limited vegetation removal that could affect nesting habitat. Impacts on migratory birds are anticipated to be minor, localized, and temporary. No substantial loss or degradation of migratory bird habitat would occur, and populations are expected to continue to utilize adjacent habitats during and following construction. Therefore, effects on migratory birds would be less than significant. BMPs and avoidance measures, including minimizing vegetation clearing and restricting clearing activities during the peak nesting season, where feasible, would be implemented to further reduce potential impacts. These measures would further minimize effects but are not required to maintain impacts below the level of significance. The Illinois Department of Natural Resources has determined that adverse impacts to the state-listed Mudpuppy, short-eared owl, and mottled sculpin are unlikely to occur (Appendix N).

Table 3.1.8. Proposed Action - Project 1 Special Status Species

Taxa	Species	Federal Listing	MI/IL State Listing	Finding of Effect	Finding Summary
Mammal	Indiana Bat (*Myotis sodalis*)	LE	E/E	NLAA	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity would result in effects that are insignificant or discountable.
Mammal	Northern Long-eared Bat (*Myotis septentrionalis*)	LE	T/-	NLAA	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity would result in effects that are insignificant or discountable.
Mammal	Tricolored Bat (*Perimyotis subflavus*)	PT	T/-	NLAA	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity would result in effects that are insignificant or discountable.
Bird	Piping Plover (*Charadrius melodus*)	LE	E/E	NLAA	Temporary disturbance may occur near suitable shoreline habitat; however, no habitat alteration or loss would occur. Effects are expected to be insignificant or discountable.
Bird	Rufa Red Knot (*Calidris canutus rufa*)	LT	-/T	NLAA	Temporary disturbance during migration may occur within suitable stopover habitat; however, no habitat modification is proposed. Effects are expected to be insignificant or discountable.
Bird	Whooping Crane (*Grus americana*)	EXPN	-/-	NLAA	Individuals may experience temporary disturbance if present; however, no habitat loss or long-term changes to habitat availability would occur. Effects are expected to be insignificant or discountable.
Bird	Black Tern (*Chlidonias niger*)	-	T/E	No Take	Temporary disturbance may occur within suitable habitat; however, no habitat loss or long-term effects are anticipated. Effects are expected to be insignificant.
Bird	Cerulean Warbler (*Setophaga cerulea*)	-	T/T	No Take	Temporary disturbance may occur within suitable habitat; however, no habitat loss or long-term effects are anticipated. Effects are expected to be insignificant.
Bird	Common Loon (*Gavia immer*)	-	T/-	No Take	Temporary disturbance may occur within suitable habitat; however, no habitat loss or long-term effects are anticipated. Effects are expected to be insignificant.
Bird	Henslow's Sparrow (*Centronyx henslowii*)	-	E/-	No Take	Temporary disturbance may occur within suitable habitat; however, no habitat loss or long-term effects are anticipated. Effects are expected to be insignificant.

Bird	Short-eared owl (*Asio flammeus*)	-	E/E	NLAA	Short-eared owl may occur within the project vicinity; however, project activities are not expected to result in habitat loss or modification. Any potential effects would be limited to temporary disturbance, and the Illinois Department of Natural Resources has determined that adverse impacts are unlikely. Effects are expected to be insignificant or discountable.
Reptile	Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)	LT	T/E	NLAA	Construction within suitable habitat may result in temporary disturbance or displacement; however, impacts are localized and short-term, and no permanent habitat loss or fragmentation would occur. Effects are expected to be insignificant or discountable.
Reptile	Spotted Turtle (*Clemmys guttata*)	-	T/E	No Take	Construction within suitable habitat may result in temporary disturbance or displacement; however, avoidance measures would prevent take and limit impacts to short-term effects. Effects are expected to be insignificant.
Reptile	Eastern Box Turtle (*Terrapene carolina carolina*)	-	T/-	No Take	Construction within suitable habitat may result in temporary disturbance or displacement; however, avoidance measures would prevent take and limit impacts to short-term effects. Effects are expected to be insignificant.
Amphibian	Blanchard's Cricket Frog (*Acris blanchardi*)	-	T/-	No Take	Construction within suitable habitat may result in temporary disturbance or displacement; however, avoidance measures would prevent take and limit impacts to short-term effects. Effects are expected to be insignificant.
Amphibian	Mudpuppy (*Necturus maculosus*)	-	SC/T	NLAA	Mudpuppies may occur within the project vicinity, including nearshore areas of Lake Michigan where individuals may use cracks, crevices, or human-made structures, particularly during winter. Project activities would avoid direct disturbance to these features by maintaining a buffer from lakebed structures and utilizing trenchless construction methods at shoreline crossings. Because nearshore work would not involve lakebed disturbance and construction timing does not coincide with periods of highest vulnerability, adverse impacts are unlikely. Effects are expected to be insignificant or discountable.
Insect	Hine's Emerald Dragonfly (*Somatochlora hineana*)	LE	E/E	NLAA	Suitable habitat occurs nearby; however, HDD and erosion controls would avoid habitat disturbance and degradation. Effects are expected to be insignificant or discountable.
Insect	Karner Blue Butterfly (*Lycaeides melissa samuelis*)[†]	LE	T/E	NE	No suitable habitat is present within the action area; therefore, no impacts would occur.
Insect	Mitchell's Satyr Butterfly (*Neonympha mitchellii mitchellii*)	LE	E/-	NLAA	No impacts to fen habitat are proposed, and indirect effects on adjacent wetlands would be minimal. Effects are expected to be insignificant or discountable.

Insect	Monarch Butterfly (*Danaus plexippus*)	PT	-/-	NLAA	Temporary, localized disturbance to individuals or host plants may occur within previously disturbed areas; however, habitat conditions would remain unchanged following construction. Effects are expected to be insignificant or discountable.
Insect	Frosted Elfin (*Callophrys irus*)	-	T/-	No Take	Suitable habitat may be present; however, project design avoids habitat disturbance, and effects are expected to be insignificant.
Insect	Persius Dusky Wing (*Erynnis persius persius*)	-	T/-	No Take	Suitable habitat may be present; however, project design avoids habitat disturbance, and effects are expected to be insignificant.
Insect	American Bumble Bee (*Bombus pensylvanicus*)	-	E/-	No Take	Suitable habitat may be present; however, project design avoids habitat disturbance, and effects are expected to be insignificant.
Insect	Ottoe Skipper (*Hesperia ottoe*)	-	E/E	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Gastropod	Proud Globe (*Mesodon elevatus*)	-	E/-	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Clam	Threehorn Wartyback (*Obliquaria reflexa*)	-	E/-	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Fish	Bigmouth Shiner (*Notropis dorsalis*)	-	T/-	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Fish	Lake Sturgeon (*Acipenser fulvescens*)	-	T/E	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Fish	Pugnose Shiner (*Notropis anogenus*)	-	E/E	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, use of trenchless methods and erosion controls would avoid impacts to habitat and water quality. Effects are expected to be insignificant.
Fish	Mottled sculpin (*Cottus bairdii*)		-/T	NLAA	Mottled sculpin may occur within the project vicinity; however, project activities are not expected to result in habitat alteration or degradation. Use of trenchless construction methods and avoidance of in-water disturbance would maintain substrate and water quality conditions. The Illinois Department of Natural Resources has determined that adverse impacts are unlikely. Effects are expected to be insignificant or discountable.

Plant	Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)	LT	E/E	NE	No suitable habitat or individuals are present within the action area; therefore, no impacts would occur.
Plant	Leafy Prairie-clover (*Dalea foliosa*)	LE	-/E	NE	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Pitcher's Thistle (*Cirsium pitcheri*)	LT	T/E	NE	No suitable dune habitat occurs within the action area; therefore, no impacts would occur.
Plant	Blue-eyed Mary (*Collinsia verna*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Showy Orchis (*Galearis spectabilis*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Tinted Spurge (*Euphorbia commutata*)	-	T/-	No Take	Suitable habitat may occur within or near the action area; however, project design and avoidance measures would avoid impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Virginia Bluebells (*Mertensia virginica*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Atlantic Blue-eyed Grass (*Sisyrinchium atlanticum*)	-	T/E	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Beach Three-awned Grass (*Aristida tuberculosa*)	-	E/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Dropseed (*Sporobolus clandestinus*)	-	E/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Few-flowered Nut Rush (*Scleria pauciflora*)	-	E/E	No Take	Suitable habitat may occur within the action area; however, avoidance measures and limited disturbance would prevent impacts on individuals or occupied habitat. No impacts are anticipated.
Plant	Ginseng (*Panax quinquefolius*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.

Plant	Panicled Hawkweed (*Hieracium paniculatum*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Rosepink (*Sabatia angularis*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Rosinweed (*Silphium integrifolium*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Swamp Cottonwood (*Populus heterophylla*)	-	E/-	No Take	Suitable habitat may be present; however, project activities would avoid impacts on individual trees and associated habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Wild Potato Vine (*Ipomoea pandurata*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Wild Rice (*Zizania aquatica*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Yellow-flowered Leafcup (*Smallanthus uvedalia*)	-	T/-	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.

Table 3.1.9. Proposed Action - Project 2 Special Status Species

Taxa	Species	Federal Listing	MI State Listing	Finding of Effect	Finding Summary
Mammal	Canada Lynx (*Lynx canadensis*)	LT	E	NLAA	Canada lynx may occur within the project vicinity; however, project activities are limited to previously disturbed areas and would not result in habitat loss or fragmentation. Any disturbance would be temporary and localized, and effects are expected to be insignificant or discountable.
Mammal	Gray Wolf (*Canis lupus*)	LE	SC	NLAA	Gray wolf may occur within the action area; however, suitable habitat is abundant and individuals are expected to avoid active construction. No denning habitat or prey resources would be impacted. Effects are expected to be temporary, localized, and insignificant.
Mammal	Northern Long-eared Bat (*Myotis septentrionalis*)	LE	T	NLAA	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity result in effects that are insignificant or discountable.

Mammal	Tricolored Bat (*Perimyotis subflavus*)	PE	T	NLAA	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity result in effects that are insignificant or discountable.
Mammal	Little Brown Bat (*Myotis lucifugus*)	–	T	No Take	Limited tree clearing during the active season may result in minor, short-term disturbance or displacement of individuals; however, the small clearing footprint, absence of known roosts or hibernacula, and use of trenchless methods to maintain canopy connectivity result in effects that are insignificant or discountable.
Bird	Rufa Red Knot (*Calidris canutus rufa*)	LT	–	NE	Project activities would not occur within suitable coastal stopover habitat and would not affect shoreline or intertidal foraging areas used by rufa red knot. Based on application of the Michigan Determination Key, no impacts would occur.
Bird	Piping Plover (*Charadrius melodus*)	LE	E	NLAA	Temporary disturbance may occur near suitable shoreline habitat; however, no habitat alteration or loss would occur. Effects are expected to be insignificant or discountable.
Bird	Common Loon (*Gavia immer*)	–	T	No Take	Temporary disturbance may occur within suitable habitat; however, no habitat loss or long-term effects are anticipated. Effects are expected to be insignificant.
Fish	Lake Herring or Cisco (*Coregonus artedi*)	–	T	No Take	Project activities near aquatic habitat may result in minor, short-term disturbance; however, buffers around spawning areas, timing considerations, and implementation of BMPs would maintain water quality and habitat conditions, resulting in effects that are insignificant or discountable.
Reptile	Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)	LT	T	NLAA	Construction within suitable habitat may result in temporary disturbance or displacement; however, impacts are localized and short-term, and no permanent habitat loss or fragmentation would occur. Effects are expected to be insignificant or discountable.
Insect	Hine's Emerald Dragonfly (*Somatochlora hineana*)	LE	E	NLAA	Suitable habitat occurs nearby; however, HDD and erosion controls would avoid habitat disturbance and degradation. Effects are expected to be insignificant or discountable.
Insect	Hungerford's Crawling Water Beetle (*Brychius hungerfordii*)	LE	E	NE	Suitable habitat for Hungerford's crawling water beetle is not present within the action area, and project activities would not affect the cold, groundwater-fed stream systems required by the species. Based on application of the Michigan Determination Key, no impacts would occur.
Insect	Monarch Butterfly (*Danaus plexippus*)	PT	E	NLAA	Temporary, localized disturbance to individuals or host plants may occur within previously disturbed areas; however, habitat conditions would remain unchanged following construction. Effects are expected to be insignificant or discountable.

Insect	Lake Huron Locust (*Trimerotropis huroniana*)	–	T	No Take	Suitable habitat may occur within the action area; however, project activities are limited in extent and avoidance measures would avoid impacts to host plants and occupied habitat, resulting in effects that are insignificant or discountable.
Gastropod	Land Snail (no common name) (*Euconulus alderi*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Gastropod	Hubricht's Vertigo (*Vertigo hubrichti*)	–	E	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Calypso or Fairy-slipper (*Calypso bulbosa*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	False Violet (*Dalibarda repens*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Ginseng (*Panax quinquefolius*)	–	T	No Take	Suitable habitat may occur; however, project design avoids impacts on individuals and habitat. No permanent habitat loss or modification would occur, and effects are not anticipated.
Plant	Hill's Pondweed (*Potamogeton hillii*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Northern Ragwort (*Packera indecora*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Pumpelly's Bromegrass (*Bromus pumpellianus*)	–	T	No Take	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Dwarf Lake Iris (*Iris lacustris*)	LT	T	LAA	Dwarf lake iris occurs within the construction corridor, and while alignment adjustments would reduce impacts, direct and indirect effects cannot be avoided. Impacts are expected to exceed insignificant or discountable levels.
Plant	Houghton's Goldenrod (*Solidago houghtonii*)	LT	E	NE	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Lakeside Daisy (*Hymenoxys herbacea*)	LT	E	NE	No suitable habitat occurs within the action area; therefore, no impacts would occur.

Plant	Michigan Monkey-flower (*Mimulus michiganensis*)	LE	E	NE	No suitable habitat occurs within the action area; therefore, no impacts would occur.
Plant	Pitcher's Thistle (*Cirsium pitcheri*)	LT	T	NE	No suitable dune habitat occurs within the action area; therefore, no impacts would occur.

Resource Area	Affected Environment	Environmental Effects
Land Use and Recreation	Based on a review of USGS Land Cover Data (Gap Analysis Project [GAP]), the Proposed Action would affect land classified as forest and woodland, agricultural, and developed (**Appendix O**) (USGS 2025b). The total area of ground disturbance anticipated from the construction of the terrestrial portion of Project 1 is approximately 10.2 acres, and approximately 12 acres for Project 2. Specific types of vegetation impacts are discussed above, in vegetation. Projects 1 and 2 would cross land classified as private, local, and state. Projects 1 and 2 do not cross Tribal or federal lands. **Appendix P** illustrates the land ownership and conservation easements for the Proposed Action. Project 1 would be directly adjacent to the following recreation areas: Hungry Horse Family Campground, East Lake Camping, Dumont Lake Family Campground, and the Chicago Lakefront Trail. Project 2 would be directly adjacent to the following recreation areas: the Alpine Soccer Complex, Camp Santa Maria, Lost Valley Retreat Center, Chain O'Lakes Campground, Snowflake Spiritualist Church Camp, Belvedere Golf Club, Beaver Island Retreat, and St. James Township Campground. The project also crosses the North Country National Scenic Trail between post marker 118 and 118.5 where the trail crosses US highway 131 N.	Consistent with Section 8.2.7 and Table 8.2.7-1 of the Michigan chapter and Section 4.2.7 and Table 4.2.7-1 of the Illinois chapter of the Central Region PEIS, there would be less-than-significant effects on land use. Changes in the existing land use would be minimal, occurring at isolated locations, and would be short-term, occurring during the construction phase, with the exception of the installation of fiber huts. However, fiber huts are of small stature and are proposed in areas with compatible land uses, therefore the Project would not conflict with existing permitted uses and would not require a change in zoning. There would be no direct or indirect permanent change in land use, with the exception of hut sites, as referred to above. In addition, there would be no conversion of agricultural lands with soils classified as prime or unique (see "Soils," above for further discussion). As there are no permanent changes to land use, there are no impacts on long term land use. Project effects on recreation would be less than significant because they would result in minimal access restrictions (on the order of hours for fiber installations) and are not anticipated to result in visitation reductions. These restrictions would occur where equipment in the project area crosses access roads or driveways. No long-term staging of equipment or material would occur that would prevent complete access to a recreation area as most of the work would occur at isolated locations adjacent to recreation areas that are not nationally significant and would persist only as long as construction. The Proposed Action would not result in the permanent conversion of land to a new land use category.
Visual Resources	Landscape characteristics at and around the Project are discussed above under Land Use. The Project would not cross or be adjacent to the following visual resources: National Heritage Areas, National Historic Landmarks, National Historical Parks, National Parks, National Forests, State parks and recreation areas,	Consistent with Section 8.2.8 and Table 8.2.8-1 of the Michigan chapter of the Central Region PEIS, there would be less than significant effects on visual resources. Disturbance associated with the installation of fiber optic cable in existing conduit would be limited to entry and exit points of the existing conduit in previously disturbed areas. Changes in the existing viewshed would be isolated

Resource Area	Affected Environment	Environmental Effects
	federal or state natural areas, wildlife refuges, or State Heritage Areas. Project 2 would cross the North Country National Scenic Trail where the trail crosses US highway 131 N, as noted in the previous section.	during the construction and deployment phases and the areas would be restored to their original state after Project deployment with the exception of huts. Huts would be 10 feet or less in height and are not expected to alter visual resources as they are not planned in any visually sensitive areas and would generally blend in with other structures. Plowing (including vibratory plowing), trenching, or directional boring and the construction of huts or hand-holes to access fiber could result in potential impacts to visual resources. Effects on visual quality and character would persist through the construction and deployment phase, but visual resources of the area would be returned to original state following the construction and deployment phase with the exception of the huts as described in Section 2.1. No visual impacts to National Scenic or National Historic Trails, National Wild and Scenic Rivers, or wilderness areas would occur from the Project, because the installation of in-ground fiber would not create visual impacts once installed. During installation, there would be minor, short-term impacts. (Appendix P).
Historic and Cultural Resources	As discussed in Section 2.1, components of Projects 1 and 2 were evaluated and refined in an iterative design process that involved multiple steps of evaluation of the terrestrial and marine work including potential landfall locations. As such the values described within this section represent the total study area at the time of the review and analysis. The acreages and amounts presented below included a greater total area than the than the final project. In accordance with guidance issued by the Advisory Council on Historic Preservation (ACHP), the Program Comment for Federal Telecommunications Projects (PC) applies to the Proposed Action and the NTIA has elected to use the PC process as an alternative to the standard Section 106 review process. The PC provides a streamlined process for Section 106 reviews by considering previous survey coverage, previous ground	Based on the cultural resources review completed for the project, and consistent with Section 8.2.11 and Table 8.2.11-1 of the Michigan chapter and Section 4.2.11 and Table 4.2.11-1 of the Illinois chapter of the Central Region PEIS, no adverse effects on historic properties or cultural resources would occur, and effects are anticipated to be less than significant. Adherence to the standard BMPs and mitigation measures would be implemented to further lessen impacts. In Project 1, the Project transverses through Jean Klock Park in Benton Harbor. Jean Klock Park was determined eligible for listing in the NRHP in 2004 for significance in 20th century landscape architecture (P48275). Project activities within the direct Project area are expected to occur underground and would be constrained to the existing right of way along Klock Road, Jean Drive, and Higman Park Road. The indirect Project area consists of a small fiber optic utility hut that would introduce a minor visual element; however, it would be located within a modernized portion of the park that has been substantially altered by

Resource Area	Affected Environment	Environmental Effects
	disturbance, and archaeological sensitivity of the Project area for direct effects in the evaluation of effects. Because most of the Project area had not been previously surveyed and the Project area included areas of moderate to high sensitivity for archaeological resources, fieldwork was conducted in those areas where practicable. The direct study area is the width of the construction ROW along the terrestrial FOC line and all staging and hut locations. An indirect study area was also added to consider the effect of permanent hut construction. The indirect study area was created by placing a 500-foot buffer around proposed hut locations. This buffer accounts for the visual, auditory, and setting-related effects of the huts, which are permanent above-ground features with footprints of approximately 9 feet by 21 feet and heights of up to 10 feet, as well as associated site clearing, foundations, and utility connections. The study area for marine archaeology consists of all submerged portions of Route 1 and Route 2, with a corridor totaling 300 feet in width and covering approximately 2.75 acres. The study area encompasses all areas of planned ground disturbances associated with the Project. Project activities such as geotechnical boring, trenching, and installation of cables have the potential to adversely affect cultural resources (i.e., archaeological sites and buried shipwrecks). The study area would also encompass the maximum horizontal and vertical extent of the planned physical effects of the Project, both directly and indirectly. The study area for Project 1 and 2, Direct and Indirect, measures approximately 1,342.27 acres. The Project 1 study area acreage was 500.35 acres, across a route. The Project 2 study area acreage was 498.23 acres across a route.	existing roads, pavement, and buried utilities. This area does not retain the defining characteristics of the historic design. Given the limited scale of the aboveground feature and the modern, previously disturbed setting, the indirect Project area would not diminish the historic landscape character or integrity of Jean Klock Park. The planned work is not expected to adversely affect the park. The direct and indirect Project 1 area traverses through Higman Park in Benton Harbor, Michigan. Higman Park is one of the earliest resort communities in southwest Michigan and was established circa 1900. The exact boundaries of the district are not well defined; however, based on SHPO mapping it appears the potential district intersects the project area along Higman Park Road. The residences adjacent to the project area on Higman Park Road are modern and were constructed after 2010. Project activities are anticipated to occur underground and constrained to the existing right of way along Higman Park Road. The indirect Project area consists of a small fiber optic utility hut that would introduce a minor visual element within an area already characterized by modern development and existing infrastructure. Given the limited scale of the aboveground feature and the modern, previously disturbed setting, the project is not expected to adversely affect resources associated with the potential Higman Park Historic District. Temporary visual and auditory disturbances are anticipated for the duration of the work within the Project area, but such disturbances would not result in adverse effects on the resources. Project 1 transverses through the Main-Water Historic District in Benton Harbor, Michigan. The Main-Water Historic District was determined eligible for listing in the NRHP by Michigan SHPO in 1999. The downtown commercial core of Benton Harbor, including historic buildings fronting Main Street and Water Street, reflects the city's early twentieth-century development and commercial significance. The exact boundaries of the district are not well defined. The district intersects the Project area along Water Street, W and E Main Street, W and W Wall Street. Project activities are expected to be restrained to the right of way along Water Street, Main Street, and Wall Street, and are not expected to adversely

Resource Area	Affected Environment	Environmental Effects
	A literature review to identify documented resources included a review of the National Historic Landmarks (NHL) List, NRHP GIS Public Database maintained by the National Park Service (NPS), Illinois Cultural Resource Management (CRM) Report Archive Database, Illinois Inventory of Archaeological Sites, (IIAS) the Historic and Architectural Resources Geographic Information System (HARGIS), Michigan SHPO Archaeological Site Files, Michigan SHPO Files for Architectural Resources, the Michigan Department of Natural Resources, the Michigan state maritime archaeologist, online shipwreck datasets including the Michigan Shipwreck Research Association (MSRA), the Michigan Underwater Preserves Commission (MUPC), and the United States Office of Coast Survey of the National Oceanic and Atmospheric Administration (NOAA) Automated Wreck and Obstruction Information System (AWOIS) and Electronic Navigational Charts (ENC) databases, historical United States Geological Survey (USGS) topographic maps, and a review of historical mapping of offshore areas maintained by the Office of Coast Survey of the National Oceanic and Atmospheric Administration (NOAA). Based on the results of the SHPO records search, less than five percent of the study area has been previously surveyed for both Project 1 and Project 2. Thus, prior studies yielded very limited information about the presence or absence of cultural resources in the study area. Based on NTIA's guidance, it was proposed that a qualified archaeologist would review information to determine the archaeological sensitivity along the Project route and consider prior disturbance through actions such as previous grading activities, existing public services and utility installation, sidewalk installation, etc. to inform plans to avoid sensitive areas or to consult on strategies for survey. A preliminary archaeological resources sensitivity assessment was conducted for Projects 1 and 2. In the	affect historic buildings in the Main-Water Historic District. Temporary visual and auditory disturbances are anticipated for the resources near the Project Area for the duration of the work, but such disturbances would not result in adverse effects on the resource. Project 1 transverses through the Benton Harbor Downtown Historic District in Benton Harbor, Michigan. The Benton Harbor Downtown Historic District was determined eligible for listing in the NRHP by Michigan SHPO in 1999. The downtown commercial core of Benton Harbor, centered along Main Street and Water Street, reflects the city's development as a regional center of commerce and industry during the late nineteenth and early twentieth centuries. The district boundaries are located along W. Main Street from 8th Street to 5th Street in downtown Benton Harbor. Project activities are expected to occur underground within the right-of-way along Pipestone Street and are not expected to adversely affect historic buildings in the Benton Harbor Downtown Historic District. Temporary visual and auditory disturbances are anticipated for the resources near the Project Area for the duration of the work, but such disturbances would not result in adverse effects on the resource. Project 1 transverses through the Lawrence Historic District in Lawrence, Michigan. The Lawrence Historic District has not been evaluated for listing the NRHP. The downtown commercial core of Lawrence, Michigan, reflects the village's development as a regional service and trade center in Van Buren County since the mid-nineteenth century. Project activities are expected to be restrained to the right of way along S Paw Paw Street and are not expected to adversely affect any historic buildings. Temporary visual and auditory disturbances are anticipated for the duration of the work, but such disturbances would not result in adverse effects on the resource. Project 2 transverses the western and southern edges of the NRHP-unevaluated West Round Lake Historic District in Charlevoix, Michigan. Project activities are constrained to the existing and paved portions of Grant Street and West Carpenter Street where the route intersects with

Resource Area	Affected Environment	Environmental Effects
	absence of significant information about previously recorded sites along the route, the study was designed to identify landforms that have an elevated potential to harbor Precontact period archaeological sites. Two datasets were used in the study, including soil data from the U.S. Department of Agriculture (USDA), NRCS Soil Survey Geographic Database (SSURGO) and the mapped locations of Quaternary shorelines from the Quaternary Geology Features dataset published by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). A search of the confidential records on file with Michigan and Illinois SHPOs identified historic properties and/or areas with high probability for cultural resources in the Project area. Similarly, the sensitivity assessment identified portions of the Project area that would benefit from survey. It was determined that a Survey and/or Monitoring Program would be implemented to avoid adverse effects. For Project 1, previous studies addressing the Project area were reviewed to determine the presence or absence of known and recorded terrestrial cultural resources. Twenty (20) previously recorded archaeological investigations and twenty-three (23) archaeological sites are on file with SHPO as occurring either in or adjacent to the Project. Project 1, crosses or intersects with five previously documented architectural resources; however, the route does not overlap any of the buildings associated with these resources. The resources include Jean Klock Park, Higman Park, The Main-Water Historic District, and the Benton Harbor Downtown Historic District in Benton Harbor, Michigan. The Project also traverses through The Lawrence Historic District in Lawrence, Michigan.	the district. Thus, Project activities are not expected to adversely affect this resource. Limited temporary visual and auditory disturbances are anticipated for properties with views to the Project for the duration of the work, but such disturbances would not result in adverse effects on the resource. Project 2 intersects the location of the NRHP-listed Seul Choix Pointe Lighthouse in Seul Choix Pointe, Michigan. The Seul Choix Pointe Lighthouse, County Road 431 at Seul Choix Pointe in the Gulliver vicinity of Mueller Township, Schoolcraft County, Michigan, was listed in the NRHP in 1984. Project 2 proposes installing underground fiber optic broadband cables along an alignment that travels below the Seul Choix Lighthouse Station, which is listed in the NRHP. The method for installation at the lighthouse property would be HDD that uses a non-percussive technique rather than percussive drilling. This non-percussive technique would push conduit underground along an alignment that would be approximately 73 feet below ground surface and more than 120 feet laterally from every structure of the Seul Choix Lighthouse Station—including the Lighthouse, Keeper's Dwelling, Steam Fog Horn Building, Boathouse, Secondary Residence, and two Oil Houses—except for the Giftshop, which is roughly 10 feet laterally from the FOC alignment. This proposed method of FOC installation would not impact any building or structure associated with the Seul Choix Lighthouse Station, all of which are assumed to be contributing features for the purposes of this Project, because of the relative depth and lateral distance of the FOC alignment. Project 2 does not include activities that are expected to cause physical destruction or alteration to any part of the property because no above-ground or at-grade equipment would be installed on the Property. No part of the property would be removed, and no change in the property's purpose of physical characteristics would occur. New visual and audible elements may temporarily appear during construction of Project 2, but these would not diminish the integrity of the property because they are not permanent. Project 2 would also not cause any

Resource Area	Affected Environment	Environmental Effects
	Jean Klock Park and Higman Park are adjoining resources. Jean Klock Park has been determined eligible for the NRHP. Higman Park has not been evaluated for listing in the NRHP. The Project also transverses the eastern portion of the Main-Water Historic District in Benton Harbor, Michigan. The Main-Water Historic District has been determined eligible for the NRHP. The final architectural resource the Project transverses in Benton Harbor is the Benton Harbor Downtown Historic District. The Benton Harbor Downtown Historic District is determined eligible for the NRHP. The Project transverses the Lawrence Historic District, which is an unevaluated district in Lawrence, Michigan. Nine (9) previously recorded archaeological sites in Project 1 are mapped within the terrestrial areas. Of the nine sites intersected by the Project, all the resources are Indigenous sites. Six of the Indigenous sites are Precontact, and two of the Indigenous sites were utilized in the 19th century. The Precontact sites include two Archaic Period sites, one Woodland Period site, and the remaining three are Precontact camps and villages of an undetermined time period. The two 19th century sites include an Indigenous sugar bush site, and an Indigenous settlement and fishing area. One site is a multi-component site with a 19th century farmhouse and a lithic scatter with an unknown temporal association. Fourteen (14) previously recorded archaeological sites are mapped within Project 2 terrestrial area. Of the fourteen sites intersected by the Project, eight of the resources are Precontact sites, four of the resources are 19th-20th century Euro-American Historic sites, and two sites are multi-component. The Precontact sites include burials, a Woodland Period village, and a mound group, and two habitation sites with undetermined temporal association. The historic sites include residential buildings and homesteads, two schools, and one church.	neglect to the property, and no property transfer, lease, or sale would happen. The primary potential impact would be surface settlement caused by ground movement during drilling. However, such settlement is unlikely to occur. The HDD alignment is located no closer than 120 feet laterally from every resource at the site aside from the Giftshop, which is approximately 10 feet laterally away, and the borehole is approximately 73 feet below ground surface—well beyond the depth at which surface movement generally occurs at this diameter of excavation. Site borings confirmed that the HDD would pass through fair to very good quality limestone bedrock beneath a thin surface soil layer. This competent rock is self-supporting and not prone to collapse or displacement. Moreover, the non-percussive technique of drilling means that vibrations are not anticipated. Nonetheless, a detailed Instrumentation and Monitoring Specification has been developed to safeguard the Suel Choix Lighthouse Station during construction. Daily surveys would record any structure movement in three dimensions. If movement of ¼ inch or greater is detected, work would pause for evaluation. At ½ inch movement, drilling would cease until a mitigation plan is approved by the engineer, owner, and permitting agencies. As a result of these safeguards, even the resource closest to the HDD alignment, the Giftshop, is highly unlikely to suffer any damage or loss of integrity through vibrations. For the duration of Project 2, a staging area and HDD landing site would be temporarily installed directly west of the Seul Choix Lighthouse Station, more than 150 feet away from the westernmost building associated with property, the Secondary Residence. The area would be restored upon construction completion so that it resembles its pre-construction appearance, thereby leaving the setting around the property unchanged.

Resource Area	Affected Environment	Environmental Effects
	In Project 2, the Project transverses three historic district boundaries, the Lawrence Historic District in Lawrence, Michigan, the Main-Water Historic District and Benton Harbor Downtown Historic District in Benton Harbor, Michigan, and the West Round Lake Historic District in Charlevoix, MI. The Project also transverses three above ground resources, Higman Park (Benton Harbor, MI), Jean Klock Park (Benton Harbor, MI), and the Seul Choix Pointe Lighthouse (Seul Choix Pointe, MI), which is listed on the NRHP. Because the Project is generally limited to existing road ROWs, the FOC does not overlap with any of the buildings associated with the historic districts. None of the previously recorded architectural resources are expected to be adversely affected by the Project. Cultural resources reviews were also completed for the geotechnical boring locations for Projects 1 and 2. These include both near shore (submerged) and on-land geotechnical boring locations. The geotechnical borings have been completed. For Project 1, drilling occurred between May 19, 2025, and June 6, 2025, and between October 21, 2025 and November 1, 2025. For Project 2, drilling occurred between May 28, 2025, and June 3, 2025; June 10, 2025, and June 24, 2025; and October 1, 2025, and October 10, 2025. To evaluate potential Tribal concerns regarding the Proposed Action, the NTIA initiated Tribal notification using the FCC's Tower Construction Notification System (notification identification number 297851).	Michigan SHPO has concurred that there would be no physical damage to and/or destruction of historic properties, there would be no indirect effects on historic properties (i.e., visual, noise, vibration, atmospheric), there would be no loss of character defining attributes of historic properties, nor would there be loss of access to historic properties. On February 4, 2026, GEI, as NTIA's delegated authority, submitted a PC Documentation Form to the Michigan state historic preservation office (SHPO) and any consulting parties. This form notified the SHPO and consulting parties of the NTIA's intention to use the ACHP PC process and provided project documentation for the review. GEI's submittal indicated that in accordance with the ACHP's guidance, no further Section 106 responsibilities are required for the Proposed Action (see **Appendix Q**). None of the portions of the new or previously recorded sites that are in the direct or indirect study areas for Project 1 and Project 2 appear to be eligible for the NRHP under any of the criteria and all lack integrity. Therefore, all archaeological sites in the study area were recommended as not eligible for inclusion in the NRHP and as such, these archaeological sites are not considered Historic Properties under Section 106. On February 26, 2026, Illinois SHPO concurred with the overall finding of no historic properties adversely affected. On March 19, 2026, the Michigan SHPO provided its response indicating its concurrence that the proposed undertakings would have no adverse effect on a concluded review conditioned on the Unanticipated Monitoring Plan. Please refer to **Appendix Q** for a copy of the SHPO concurrence letters. To evaluate potential Tribal concerns regarding the Proposed Action,

Resource Area	Affected Environment	Environmental Effects
		the NTIA initiated Tribal notification using the FCC's Tower Construction Notification System (notification identification number 297851) Seven Tribal responses were received during the Tribal consultation period, which did not result in the identification of any additional potential historic properties (see **Appendix R**). Consultation concluded December 29, 2025. As reviewed under the Program Comment (PC) for Federal Telecommunications Projects, the Project meets conditions that require no further review. Consultation under Section 106 is complete. Inventory and evaluation studies were completed for marine archaeology, terrestrial archaeology, and architectural history. The studies recommended a finding of No Adverse Effect as provided in 36 CFR Part 800.5(b), to which both Michigan and Illinois concurred. No historic properties were identified and no additional Tribal consultation is required.
Air Quality	Berrien County, Michigan and Cook County, Illinois, located within Project 1, are designated as serious nonattainment areas with the 8-hour ozone (2015) standard and Cook County, Illinois is designated as a maintenance area for lead (2008) (USEPA 2025b).The Project 2 counties are designated as attainment areas with the National Ambient Air Quality Standards (NAAQS) (USEPA 2025b). Volatile organic compounds (VOCs) and nitrogen oxides (NOx) are considered precursor pollutants of ozone. Therefore, a General Conformity determination is required for VOCs, NOx, and lead. The Proposed Action is not within 100 kilometers of any Class I area(s) (First Net 2017).	Consistent with Section 8.2.12 and Table 8.2.12-1 of the Michigan chapter and Section 4.2.12 and Table 4.2.12-1 of the Illinois chapter of the Central Region PEIS, there would be less than significant effects on air quality. Negligible emissions would occur for any criteria pollutants within an attainment or nonattainment area but would not cause a NAAQS exceedance. All emission units associated with the proposed construction would be temporary and short-term, and emissions would be spread over the construction period. In addition, emission sources within the project area are generally considered mobile sources and/or exempt from permitting under the CAA, except for the portable stationary air emission sources that would be located at landing locations, including a horizontal directional drill, diesel generator, mud pumps, etc., which would be permitted. No major operational emissions would occur as part of the Project, and no Title V permit is required. Because most of the fiber installation would be transitory in nature, the areas of greatest potential for sustained air quality impacts are the proposed landing sites, which would require a more prolonged

Resource Area	Affected Environment	Environmental Effects
		use of heavy equipment due to the efforts required for their construction. The calculated air emissions per landing location were compared to the de minimis thresholds provided in 40 CFR 93.153(b)(1) for serious nonattainment areas and 40 CFR 93.153(b)(2) for maintenance areas. The projected VOC emissions (1.4 tons per year) are below the *de minimis* threshold of 50 tons per year for serious ozone nonattainment areas. The projected NOx emissions (6.0 tons per year) are below the *de minimis* threshold of 50 tons per year for serious ozone nonattainment areas. The projected lead emissions are considered negligible and therefore below the *de minimis* threshold of 25 tons per year for lead maintenance areas. Given that the project emissions in nonattainment and maintenance areas are below the *de minimis* levels, the Project is exempt from conformity determination. Activities at project locations beyond the landing locations may include plowing, trenching, handhole installation, staging locations, and hut site construction, which are anticipated to use mobile equipment or equipment that is exempt from air permitting requirements under the CAA.
Noise and Vibration	Generally, land surrounding the Proposed Action is urban, rural, agricultural, and residential. There are noise-sensitive receptors in proximity to the Proposed Action that could be susceptible to increased noise levels during construction or operation. Noise-sensitive receptors include residences, schools, places of worship, libraries, and parks. There are no sensitive receptors within 150 feet of the Project 1 route. The nearest noise-sensitive receptor to the Project 2 route is the Beaver Island Community School, located approximately 100 feet from the route. Construction equipment can intermittently operate at maximum sound levels ranging between 92 and 115	Consistent with Section 8.2.12 and Table 8.2.12-1 of the Michigan chapter and Section 4.2.12 and Table 4.2.12-1 of the Illinois chapter of the Central Region PEIS, there would be less than significant noise and vibration effects and adherence to the standard BMPs and mitigation measures in Chapter 19 of the PEIS would be implemented, as appropriate, to further reduce noise impacts. Noise and vibration levels resulting from Project activities would exceed natural sounds but would not exceed typical levels from construction equipment. Noise-producing activities during construction would occur 5 days a week between 7 a.m. and 7 p.m. Exceptions to this may occur during certain construction activities such as HDD installation under railways, major highway crossings, and shore landings but effects would remain less than significant as these areas are generally away from noise sensitive receptors.

Resource Area	Affected Environment	Environmental Effects
	decibels (dB)[6]. Maximum construction-related noise levels at 50 feet from this equipment could range from 84 to 109 dB. Construction noise in a well-defined area typically attenuates at approximately 6 dB per doubling distance. Therefore, at a distance of 100 feet, the construction noise level would be approximately 78 to 103 dBA (A-weighted decibels)[7], and at a distance of 200 feet, the noise levels would range from 72 to 97 dBA, and to 66 to 91 dBA at 400 feet. Background noise levels around 75 dB are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. For reference, a lawn mower operates at about 94 dB and the typical decibel range of a dog bark is between 60 dB and 110 dB. City traffic produces approximately 80-85 decibels, washing machines and dishwashers operate at approximately 70 dB, and normal conversations occur at 60 dB.	Construction equipment would be outfitted with exhaust mufflers and engine enclosures that are in place and in good working order for all on-site trucks and equipment. Engine enclosures reduce low-frequency noise coming from the engine, while an exhaust muffler deadens the noise of escaping gases from combustion, similar to a car muffler. Construction limits would be clearly demarcated to prevent the general public from walking into the construction zone during active activities.
Human Health and Safety	PFN would ensure that safe work conditions are provided and enforced during construction of the Proposed Action. GEI reviewed the following databases to determine if contaminated and hazardous waste sites were within or adjacent to Projects 1 and 2: • US EPA Underground Storage Tank (UST) Finder database and MI EGLE UST database to identify the location of USTs that may have an adverse impact on the subsurface conditions within the Project 1 and 2 routes as well as tree clearing locations. • US EPA Enforcement and Compliance History	Consistent with Section 8.2.12 and Table 8.2.12-1 of the Michigan chapter and Section 4.2.12 and Table 4.2.12-1 of the Illinois chapter of the Central Region PEIS, there would be no significant effects on human health and safety and standard BMPs and mitigation measures in Chapter 19 of the PEIS would be implemented, as appropriate, to further reduce human health and safety impacts. Construction of the Project would not expose workers to hazardous chemicals, and contaminated sites are not known to exist in the Project area, but any discovered during construction and deployment would be handled in accordance with applicable regulations. Although manmade disasters cannot be predicted, PFN confirms it would monitor for natural disasters and ensure that safety plans

[6] A decibel is a unit for measuring the relative intensity of sounds.

[7] An A-weighted decibel is the relative loudness of sounds as perceived by the human ear.

Resource Area	Affected Environment	Environmental Effects
	Online (ECHO) database layer to identify registered ECHO facilities and associated enforcement and compliance data for air emissions from stationary sources, surface water dischargers, hazardous waste handlers, and drinking water systems. • Michigan EGLE's Part 201 Environmental Contamination Sites database to identify locations of facilities where environmental contamination has been documented within or near the area of the Proposed Action. Although ECHO facilities and USTs were identified in the Project area (452 ECHO facilities and/or USTs were within 300ft of Project 1; 180 ECHO facilities and/or UT were within 300ft of Project 2), none of these facilities intersect the Project 1 or Project 2 routes. **Appendix S** provides the location of these facilities.	and evacuation routes are communicated to workers. The Project is anticipated to have an overall positive impact on human health and safety as unserved and underserved areas gain improved connectivity (e.g. telehealth care, emergency response networks etc.) and network resilience (e.g. the redundant routes to Chicago to strengthen the network). This would reduce challenges that subscribers and institutions would continue to face during growing demand for higher-quality broadband services. In the absence of this project, communities may turn to alternative, and potentially more environmentally disruptive, solutions to meet their connectivity needs.

Table 3.2. compares the effects of the Other Action Alternative identified in Section 2.2 to the effects of the Preferred Action Alternative.

Table 3.10. Comparison of the Action Alternatives

Resource Area	Effects of Preferred Action Alternative	Affected Environment and Effects of No Action Alternative
Infrastructure	Less than significant. There would be minimal to no adverse effects on traffic or utility service levels and any effects would be limited in time and location. Potential effects on traffic patterns during construction would be reduced to less than significant levels with implementation of a Traffic Control Plan (**Appendix G**).	Affected Environment: No unique types of infrastructure would be crossed by the No Action Alternative. Effect Determination: No effect. There would be no effect on traffic or utility service levels because the fiber would not be constructed and installation crews would not need access to project areas.
Soils	Less than significant. There would be minimal to no adverse effects on soils due to erosion, topsoil mixing, or perceptible soil compaction. Any adverse effects on soils during construction of the terrestrial project routes would be limited and temporary and prior conditions would be restored once construction has been completed. Construction of the marine Project route would result in low levels of sediment that are mobilized during cable laying causing only low levels of deposition around the cable route.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, no soil would be disturbed. Effect Determination: No effect. There would be no effect on soils because the fiber would not be constructed and temporary adverse effects on soils during the construction of the terrestrial fiber would not occur. In addition, there would be no effects on lakebed soils since the marine route would not be constructed.
Geology	Less than significant. Locations with karst topography would be avoided during construction. The footprint of the terrestrial and marine Project routes would not affect, or be affected by, areas with geologic hazards.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, the No Action Alternative would not affect, or be affected by, areas with geologic hazards. Effect Determination: No effect. There would be no effect on geology because the fiber would not be constructed; therefore, there would be no effects on geology resulting from direct underground plowing or HDD installation methods.
Water Resources	Less than significant. Surface water resources would be fully avoided and protected through directional drilling. In addition, an Inadvertent Release (Frac-Out) Plan (**Appendix K**) has been prepared to include the procedures and responsibilities for preventing, detecting, containing, and cleaning up frac-outs during directional drilling operations.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, the No Action Alternative would not result in the potential for frac-outs. Effect Determination: No effect. There would be no effect on water resources because the fiber would not be constructed;

Resource Area	Effects of Preferred Action Alternative	Affected Environment and Effects of No Action Alternative
		therefore, there would be no frac-outs from directional drilling operations. In addition, since the fiber would not be constructed, there would be no waterbody crossings or crossings of floodplains, wild and scenic rivers, and sole source aquifers. Lastly, there would be no impact on Lake Michigan bottomlands, as no fiber would be installed on the lakebed.
Wetlands	Less than significant. Potential effects on wetlands may result in periodic or temporary loss of wetlands that may be reversed over 1-2 growing seasons, and there would be no effects on high quality or special value wetlands.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, the No Action Alternative would not result in the potential for loss of wetlands. Effect Determination: No effect. There would be no effect on wetlands because the fiber would not be constructed; therefore, there would be no periodic or temporary loss to wetland type and function. Since the fiber would not be constructed, there would be no permanent impacts due to the structural fill associated with fiber cable construction. There would also be no temporary wetland impacts due to equipment access for plow installation methods through wetland areas.
Biological Resources	Less than significant. Project 1 may affect, but would not be likely to adversely affect, ten federally listed species, based on adherence to agency-identified construction windows as discussed above. Project 1 would have no effect on the remaining four federally listed species, as they are not present at the Project site. Project 2 may affect, but is not likely to adversely affect, eight federally listed species, based on adherence to agency-identified construction windows as discussed above. Project 2 may affect and is likely to adversely affect one federally listed species. Project 2 would have no effect on the remaining six federally listed species, as they are not present at the Project site.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, the No Action Alternative would not result in potential effects on federally listed species. Effect Determination: No effect. There would be no effect on biological resources because the fiber would not be constructed; therefore, fiber installation methods, vegetation and tree clearing, and other ground disturbing activities that could impact biological resources would not occur.
Land Use and Recreation	Less than significant. Changes in the existing land use would be minimal, occurring at isolated locations, and would be short-term, occurring during the construction phase. The Project would not conflict with existing permitted uses and would not require a	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, there would be no changes in land use during construction and no minimal access restrictions on recreational areas.

Resource Area	Effects of Preferred Action Alternative	Affected Environment and Effects of No Action Alternative
	change in zoning. Hut sites will represent a permanent change to land use, but the footprint is minimal. There would be no other direct or indirect permanent change in land use. In addition, there would be no conversion of prime or unique agricultural lands. Project effects on recreation would be less than significant because they consist of minimal access restrictions and visitation reductions, occur at isolated locations that are not nationally significant, and would persist only as long as construction. Additional temporary impacts would result from construction and may impact recreation in the forms of increased construction noise during operations, and atmospheric impacts.	Effect Determination: No effect. There would be no effect on land use and recreation because the fiber would not be constructed. Since the fiber would not be constructed, there would be no temporary or permanent land use impacts from ground disturbing activities due to fiber installation, HDD entry and exit bore pits, hut sites, temporary staging areas, and the shore landing sites.
Visual Resources	Less than significant. Disturbance associated with the installation of fiber optic cable in existing conduit would be temporary and limited to entry and exit points of the existing conduit in previously disturbed areas. Changes in the existing viewshed would be isolated during the construction and deployment phases and the areas would be restored to their original state after Project deployment, with the exception of the huts. Huts would be 10 feet or less in height and are not expected to alter visual resources as they are not planned in any visually sensitive areas and would generally blend in with other structures.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, there would be no change in the existing viewshed. Effect Determination: No effect. There would be no effect on visual resources because the fiber route and huts would not be constructed; therefore, there would be no effects on visual quality and character of the project area.
Historic and Cultural Resources	Less than significant. Inventory and evaluation studies were completed for marine archaeology, terrestrial archaeology, and architectural history. Michigan SHPO, Illinois SHPO, and federally recognized tribes in the project area were invited to identify potential historic properties that could be impacted by the project. The effects that the Project would have on the Seul Choix Pointe Lighthouse Station (P24762) were assessed in compliance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations 36 CFR Part 800, as amended. The NRHP-listed property is considered a Historic Property per Section 106. The studies recommended a finding of No Adverse Effect as provided in 36 CFR Part 800.5(b). Michigan SHPO concurred with the finding of No Adverse Effects	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, the No Action Alternative would not result in impacts on historic and cultural resources. Effect Determination: No effect. There would be no effect on historic and cultural resources because the fiber would not be constructed; therefore, no historic or cultural resources would be impacted.

Resource Area	Effects of Preferred Action Alternative	Affected Environment and Effects of No Action Alternative
	with conditions on March 19, 2026. Illinois SHPO concurred with the finding of No Adverse Effect on February 26, 2026 for the portions of the project within their jurisdiction. No additional potential historic properties were identified via Tribal consultation. As reviewed under the Program Comment (PC) for Federal Telecommunications Projects, the Project meets conditions that require no further review. Consultation under Section 106 is complete.	
Air Quality	Less than significant. Negligible emissions would occur for any criteria air pollutants within attainment, nonattainment, and maintenance areas and would not cause a NAAQS exceedance.	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, there would be no emission of criteria air pollutants. Effect Determination: No effect. There would be no effect on air quality because the fiber would not be constructed, so there would be no emissions that would occur.
Noise and Vibration	Less than significant. Noise and vibration levels resulting from Project activities would exceed natural sounds but would not exceed typical levels from construction equipment. Noise-producing activities during construction would occur 5 days a week between 7 a.m. and 7 p.m. Exceptions to this may occur during certain construction activities such as HDD installation under railways, major highway crossings, and shore landings but effects would remain less than significant as these areas are generally away from noise sensitive receptors	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, there would be no construction-related noise and vibration. Effect Determination: No effect. There would be no effect on noise and vibration levels because the fiber would not be constructed; therefore, there would be no noise and vibration levels exceeding normal ambient levels.
Human Health and Safety	Less than significant. The Project would not expose workers to hazardous chemicals, and contaminated sites are not known to exist in the Project area, but there is the potential of discovering previously unknown contaminated sites during construction and deployment. Further, The Alternative to the Preferred Action is likely to have a positive effect on human health and safety as unserved and underserved areas would gain improved connectivity to telehealth care, emergency response networks, etc. and network resilience (e.g. the redundant routes to Chicago to strengthen the network). This would reduce challenges that subscribers and institutions would continue to face during growing demand for higher-quality	Affected Environment: There would be no construction activities under the No Action Alternative; therefore, there would be no potential of discovering previously unknown sites during construction and deployment. Effect Determination: No effect. There would be no effect on human health and safety because the fiber would not be constructed so there is no potential of discovering previously unknown contaminated sites within the project area. The No Action alternative may also result in a negative impact on health and human safety as unserved and underserved areas would remain without adequate broadband access, limiting their access to

Resource Area	Effects of Preferred Action Alternative	Affected Environment and Effects of No Action Alternative
	broadband services.	telehealth care, emergency response networks, and resulting in lower network resilience. Subscribers and institutions would continue to face constraints in utilizing modern communications technologies and as demand for higher-quality broadband services continues to grow, communities may turn to alternative, and potentially more environmentally disruptive, solutions to meet their connectivity needs.
Conclusion	The Preferred Action Alternative would result in less than significant environmental effects.	The No Action Alternative would result in no environmental effects; however, under the No Action alternative, the project purpose and need would not be met, and unserved and underserved areas would remain without adequate broadband access. Although there are no environmental impacts associated with the No Action Alternative when compared to the Proposed Action, there is the potential for multi-generational negative impacts which include loss of earning potential and knowledge as rural communities decrease in population, loss of business revenue as corporations and industry focus on areas with existing high-speed internet infrastructure, the potential for a lower standard of medical care than in areas with connectivity due to lack of telehealth services, low network resilience, and limited connectivity in rural communities.

4. Reasonably Foreseeable Effects

This section evaluates the reasonably foreseeable effects of the Project on the environment resulting from reasonably foreseeable future actions, including projects other than those evaluated in this EAs, regardless of the agency (federal or non-federal) or person undertaking those actions. Section 3 considered past actions as part of evaluating the affected environment (i.e., baseline conditions).

Last mile infrastructure is considered a consequence of the Proposed Action because it would not occur but for this project; however, the plans and extent of last mile installations are currently unknown as these projects are still in the planning stages and therefore cannot be included in the Action Area at this time.

No additional consequences are reasonably certain to occur as a result of the Proposed Action. The project consists of installing underground fiber optic cable primarily within existing road rights-of-way and previously disturbed areas as well as marine cable placement along the bed of Lake Michigan. Associated features such as utility huts, handholes, shore landing sites, and temporary staging areas are integral components of the Proposed Action and have been accounted for in the immediate impact area.

The project does not involve new permanent roads or infrastructure development that would induce secondary growth or expansion. No future projects beyond the aforementioned last mile fiber projects have been identified that are contingent upon completion of this fiber installation.

Table 4.1. identifies present and reasonably foreseeable future actions within range of the Proposed Action area. This EA concludes that although these actions together have the potential to result in minor reasonably foreseeable effects, the incremental effects of the Proposed Action, when added to those effects, would not be significant.

Table 4.1. Present and Reasonably Foreseeable Future Actions

Action Name	Location	Sponsor or Proponent	Brief Description	Anticipated Timing
Nottawaseppi Huron Band of Potawatomi Tribal Broadband and Use Project	Michigan	Funding: Tribal Broadband Connectivity Program Recipient: Nottawaseppi Huron Band of Potawatomi	The project would include the following (NTIA 2025a): • increase existing circuits from 2Gb to 6Gb. Tribal government speeds would be maintained by 1Gb for government functions and the operation of a guest network. • Procure software for ISP management to maintain network for residential	Unknown at this time

			service areas; • Purchase and install broadband equipment to upgrade service area cellular and public address communication systems; • Purchase software and licenses for broadband equipment functional use; Microsoft Office 365, Zoom, Box.com; • Upgrade existing network firewalls and security measures; and • Conduct annual penetration testing of network. • Improve connectivity at Tribal government offices, Tribal businesses, and community anchor institutions in addition to 35 Tribal households	
Bay Mills Indian Community Tribal Broadband Project 2021	Brimley, Michigan	Funding: Tribal Broadband Connectivity Program Recipient: Bay Mills Indian Community	The project would complete a network operations center (NTIA 2024)	Ongoing
Lac Vieux Desert Band of Lake Superior Chippewa Indians Broadband Infrastructure, Use,	Watersmeet, Michigan, or on lands designated by the Assistant Secretary of Indian	Funding: Tribal Broadband Connectivity Program Recipients: Lac	The project would enhance and expand telehealth capabilities, remove barriers to	Unknown at this time

and Development Project	Affairs of the Department of the Interior and that are near to the reservation where financial assistance and social service programs are provided to individuals because of their status as Indians	Vieux Desert Band of Lake Superior Chippewa Indians Community	broadband access, and allow the Tribe to engage in Broadband Infrastructure Planning (NTIA 2025b).	
MOON-Light Project	Michigan	Funding: Broadband Infrastructure Program Recipient: East Lansing Subrecipient: Merit Network, Inc.	The project intends to expand the optical capabilities of Merit's existing 2,200-mile physical fiber network. MOON-Light would expand the optical capabilities of Merit's existing fiber network by adjusting the sizing and capacity of the optical network to reduce power and colocation requirements and replace aging multi-slot terminal technologies with modern data center interconnect technologies capable of supporting both new and existing services from 10 Gbps to 800 Gbps capacities either natively or through aggregation onto the coherent core architecture. (NTIA 2025c)	Ongoing
Broadband Equity, Access, and Deployment (BEAD)	Michigan	Potential funding: BEAD Proponent:	The Michigan High Speed Internet Office (MIHI) BEAD	Proposal approved December 16,

Final Proposal		Michigan High Speed Internet Office Recipient: Various, including Tribes and local Michigan communities	Final Proposal includes 334 project awards to 30 organizations and includes a mix of technologies to address the state's unique communities and needs. Additionally, MIHI proposes using other deployment dollars to support the "national security imperative for the United States to achieve and maintain unquestioned and unchallenged global technological dominance," mainly through artificial intelligence and other transformative technologies, American First Policy Initiatives focused on investing in education, training the workforce, and growing our industries (Michigan Department of Labor and Economic Opportunity 2025)	2025.

Sources: NTIA 2024, NTIA 2025a, NTIA 2025b, NTIA 2025c, Michigan Department of Labor and Economic Opportunity 2025

5. Relevant Laws, Regulations, and Permits

Table 5.1. lists relevant laws, regulations, and permits for the Project and describes the compliance status for each, including the status of any applicable consultations. PFN confirms that it is consulting with the applicable federal and state agencies and applicable local municipalities/entities regarding proposed Project 1 and Project 2 construction and will comply with all applicable laws and regulations.

Table 5.1. Relevant Laws, Regulations, and Permits

Laws and Regulations	Status
General	
• National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 *et seq.*)	Environmental Assessment in process
Vegetation, Wildlife, and Fish	
• Endangered Species Act (ESA) (16 U.S.C. § 1531 *et seq.*) • Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712) • E.O. 13186, Responsibilities to Federal Agencies to Protect Migratory Birds • Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. §§ 668-668d) • Fish and Wildlife Conservation Act (16 U.S.C. §§ 2901-2911] • Fish and Wildlife Coordination Act (16 U.S.C. § 661 *et seq.*) • Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq.*) • Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 • Part 365 – Endangered Species Protection • Illinois Endangered Species Protection Act (520 ILCS 10) • Illinois Natural Areas Preservation Act (525 ILCS 30)	• Endangered Species Act (ESA) (16 U.S.C. § 1531 et seq.) *Status:* Section 7 consultation initiated with USFWS via IPaC; Biological Assessment prepared. Formal Section 7 consultation initiated for the finding of may affect, likely to adversely affect the dwarf lake iris; consultation is ongoing. *Description:* Effects determinations completed for listed species; avoidance and minimization measures incorporated (e.g., HDD at sensitive crossings, timing restrictions for tree clearing). No critical habitat present. • Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712) *Status:* Compliance through avoidance measures. *Description:* Construction scheduled outside peak nesting periods where feasible; no intentional take of migratory birds anticipated. • E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds *Status:* Addressed through MBTA compliance measures. *Description:* Project incorporates BMPs to minimize disturbance to migratory birds during construction. • Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. §§ 668-668d) *Status:* No eagle nests or roosts identified in project area. *Description:* Compliance achieved; monitoring during construction will ensure no disturbance if eagles are observed. • Fish and Wildlife Conservation Act (16 U.S.C. §§

	2901-2911) *Status:* Voluntary compliance through habitat protection measures. *Description:* Project design avoids high-quality habitats; BMPs implemented to minimize impacts to non-game species. • Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.) *Status:* Coordination with USFWS as part of ESA Section 7 consultation is in progress. *Description:* HDD used at water crossings to avoid habitat disturbance; recommendations incorporated. • Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.) *Status:* EFH consultation not triggered; project occurs in Great Lakes, not marine EFH. *Description:* Underwater cable placement designed to minimize lakebed disturbance; HDD at shore landings to avoid shoreline distrubances. • Michigan NREPA, Part 365 – Endangered Species Protection *Status:* State-listed species reviewed; compliance through avoidance and minimization measures. *Description:* Habitat surveys completed; reroutes and timing restrictions implemented to protect state-listed species. • Illinois Endangered Species Protection Act (520 ILCS 10) *Status:* EcoCAT review completed; no adverse impacts anticipated. *Description:* HDD and avoidance measures prevent impacts to listed species. • Illinois Natural Areas Preservation Act (525 ILCS 30) *Status:* No designated Illinois Natural Areas within project footprint. *Description:* Compliance achieved; project confined to disturbed ROW and developed areas.
Waters, Wetlands, and Floodplain Protection	
• Clean Water Act (CWA) (33 U.S.C. § 1251 *et seq.*) • Floodplain/Wetlands Environmental Review Requirements (10 C.F.R. § 1022.12)	• Clean Water Act (CWA) (33 U.S.C. § 1251 *et* seq.) *Status:* Federal and state authorizations obtained or pending *Description:* Temporary impacts to waters and wetlands are authorized through USACE Section 404 (NWP 57) and associated EGLE permits, including Water Resources Division General Permits issued under Part 325. Water quality compliance is ensured through EGLE Section 401 Water Quality Certification. HDD methods are used to minimize impacts at shoreline and water

	crossings. • Rivers *and Harbors Act of 1899 (33 U.S.C. § 403)* *Status*: Section 10 authorization required and being obtained. *Description:* Work within Lake Michigan is authorized through USACE Section 10 approvals coordinated via the EGLE/USACE Joint Permit Application processes. • *Floodplain/Wetlands Environmental Review* (10 C.F.R. § 1022.12) *Status:* Addressed through project design and permitting. *Description*: HDD and offshore boring methods avoid floodplain alteration and minimize wetland disturbance. No long-term floodplain impacts are anticipated.
Air Quality	
• Clean Air Act (CAA) (42 U.S.C. § 7401 *et seq.*)	• *Clean Air Act (CAA) (42 U.S.C.* § 7401 *et seq.*) *Status:* State permits are being obtained. *Description:* Proposed air emission sources at the HDD landing locations are authorized through EGLE permits. Emission sources are anticipated to meet EPA emission standards (Tier 1-4) for certain criteria pollutants. Air permitting requirements are limited to HDD landing locations, where equipment usage and duration may trigger applicable state permitting thresholds. Emission sources are anticipated to comply with applicable federal requirements under the Clean Air Act, including EPA Nonroad Diesel Engine Standards for criteria pollutants. Emissions from other construction activities are short-term and dispersed and are not anticipated to require air permitting.
Historic and Cultural Resources	
• National Historic Preservation Act (NHPA) (54 U.S.C. § 300101 *et seq.*) and NHPA Section 106 regulations (36 C.F.R. Part 800)	*Status:* Section 106 of the NHPA consultation initiated with Michigan and Illinois SHPO. Cultural resources studies prepared and submitted. On February 26, 2026, Illinois SHPO concurred with the overall finding of no historic properties adversely affected. On March 19, 2026, the Michigan SHPO provided its response indicating its concurrence that the proposed undertakings will have no adverse effect on a concluded review conditioned on the Unanticipated Monitoring Plan.

	To evaluate potential Tribal concerns regarding the Proposed Action, the NTIA initiated Tribal notification using the FCC's Tower Construction Notification System (notification identification number 297851) , 7 Tribal responses were received, and none of the responses identified additional potential historic properties that could be impacted by Projects 1 and 2. Tribal consultation concluded December 29, 2025. *Description:* Effects determinations completed, with a finding of no adverse effects on historic properties. Section 106 review is complete.
Noise, Public Health, and Safety	
• Spill Prevention Control and Countermeasures Rule (40 C.F.R. § 112.12) • Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601 *et seq.*) • Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 *et seq.*)	• Spill Prevention Control and Countermeasures Rule (40 C.F.R. § 112.12) *Status:* Applicable. *Description*: Shore landing HDD Contractor(s) will be responsible for complying with 40 CFR 112 for oil storage above the regulatory threshold. Standard best management practices will include proper equipment fueling and maintenance procedures, use of spill kits, prompt containment and cleanup of any releases, and adherence to contractor environmental control requirements. Contractors will be responsible for implementing these measures in accordance with applicable federal and state regulations and project-specific environmental protection plans. Formal spill prevention plan requirements under the Spill Prevention, Control, and Countermeasure Rule are not anticipated to be triggered for most project areas due to the temporary and mobile nature of fuel storage; however, applicable requirements will be followed where thresholds are met. • Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601 *et seq.*) *Status:* Not Applicable. • Resource Conservation and Recovery Act (RCRA) 42 U.S.C. § 6901 *et seq.*) *Status:* Not Applicable.
STATE, COUNTY, AND LOCAL PLAN CONSISTENCY	

• *Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451* • *Part 301 – Inland Lakes and Streams* • *Part 303 – Wetlands Protection* • *Part 325 – Great Lake Submerged Lands (MCL 324.32501 et seq.) Part 91 – Soil Erosion and Sedimentation Control (MCL 324.91901 et seq.)* • *Michigan Coastal Zone Management Program (CZMP)* • *Illinois Administrative Code Part 3704 – Construction in the Vicinity of Lake Michigan* • *Illinois Coastal Management Program* • *Applicable County Soil Erosion and Sedimentation Control Ordinances (Michigan)* • *Applicable Local Zoning, Right-of-Way, and Building Ordinances (Michigan and Illinois)*	• *State, County, and Local Plan Consistency (Michigan and Illinois)* *Status*: Consistent with applicable state, county, and local plans and regulatory frameworks. *Description*: In Michigan, the Proposed Action is consistent with NREPA and local ordinances through EGLE and relevant county agencies, including permits for work regulated under Parts 301, 303, 325, and Part 91. County-issued SESC approvals are anticipated in Berrien, Charlevoix, and Schoolcraft Counties. The project is also consistent with the CZMP, as coastal and nearshore activities will be implemented in coordination with EGLE and designed to minimize impacts to coastal resources through the use of horizontal directional drilling, avoidance of sensitive features, and implementation of best management practices. In Illinois, the project is consistent with IDNR Lake Michigan shoreline regulations under Part 3704. Local permits, including SESC, right-of-way, and building permits, will be obtained prior to construction where required.

6. List of Preparers

Table 6.1. lists the individuals involved in preparing this EA.

Table 6.1. List of Preparers

Name	Organization	Title/Role	Qualifications
Matt Peramaki	GEI Consultants	Project Manager	See **Appendix T** for Staff Resumes
Jennifer Shelton	GEI Consultants	Project Coordinator	
Jenifer King	GEI Consultants	NEPA Specialist	
Eric Englund	GEI Consultants	NEPA Specialist	
Denise Jurich	GEI Consultants	Cultural Resources Lead	
Mari Olson	GEI Consultants	Biological Resources Lead	
Sarah Krantz	GEI Consultants	Biologist	
Emma Horvath	GEI Consultants	Engineer	

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Appendix A: Overview Maps and Staking Sheets

Appendix B: Representative Photographs

Appendix C: Biological Assessment and Biological Opinion

Appendix D: Shore Landing HDD

Appendix E: Alternative Analysis Project 1

Appendix F: Alternative Analysis Project 2

Appendix G: Traffic Mitigation Plan

Appendix H: Soil Surveys

Appendix I: Water Resources

Appendix J: Wetland Delineations

Appendix K: Frac-Out Plans

Appendix L: Summary of Impacts

Appendix M: Biological Resources Species Effects

Appendix N: Biological Resources Correspondence

Appendix O: Land Cover

Appendix P: Land Use and Conservation Easements

Appendix Q: Cultural Resources Coordination

Not Intended for Public Review or Release

Documentation contained in this Appendix is limited to general correspondence with State Historic Preservation Offices. Specific cultural resource documents have been purposefully omitted due to the confidential nature of cultural resource location information. Anyone with a legitimate need to review this documentation should contact the following individual:

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Appendix R: Tribal Consultation

Appendix S: ECHO Facilities and Underground Storage Tank Locations

Appendix T: Staff Resumes