

Appendix B – Project Description

National Telecommunications and Information Administration

Project Description

NANA Regional Corporation, Inc. (NT23TBC0290014)

NANA Region Middle Mile Fiber Optic Project

Northwest Arctic Borough, Alaska

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1 Project Overview

The NANA Region Middle-Mile Fiber Optic Project (project) aims to establish a reliable, scalable, and future-proof fiber-based broadband network connecting communities in the Northwest Arctic Borough (NAB) to provide affordable high-speed and low-latency internet services to thousands of individuals (Figure 1). This critical telecommunications infrastructure will address long-standing connectivity challenges in the region; it is also designed to serve the region's communities for decades to come.



Figure 1: Map of project area

The fiber optic cable (FOC) route will incorporate a combination of terrestrial ground-laid, subsea, trenched, directionally bored, and aerial cable placement methodologies. The majority of the network will consist of ground-laid fiber (GLF) installed during winter months to minimize impacts to subsistence as well as the sensitive tundra environment. This approach has been successfully implemented in other regions of Alaska, including the Arctic Slope Telephone Association Cooperative (ASTAC) North Slope Fiber Optic Project and the GCI Airraq Fiber Optic Project projects (ASTAC 2019, 2024, BLM 2019, NTIA 2024).

NANA has carefully designed the project to balance environmental protection, respect for subsistence way of life to residents of the NAB, network reliability, construction feasibility, and long-term maintenance requirements. The proposed route represents a refined alignment developed following extensive community consultation, agency feedback, and technical feasibility analysis. Specifically, the process included multiple outreach and engagement activities: visits to each community in 2024 to engage tribes, as well as community members and organizations; a consultation with ASTAC to incorporate lessons learned from their completed North Slope FOC project; and three detailed feasibility or route reviews in partnership with industry experts: New Horizons (2024), Sturgeon Electric, and Kuna Engineering.

2 Project Detailed Descriptions

The project consists of multiple integrated components strategically located throughout the NAB, with project supporting activities planned to occur between Spring 2025 and Fall 2026, and potentially into 2027, while construction activities are expected within that window from Spring 2026 through Fall 2026.

2.1 Project Components

The project consists of the installation of approximately 661 miles of 0.472 in. diameter armored FOC designed specifically for Arctic conditions. This cable contains 24 strands of optical fiber and will connect all communities in the NAB to high-speed broadband internet.

The proposed hybrid GLF approach combines elements of multiple methodologies, primarily utilizing surface-laid terrestrial FOC with strategic marine, aerial, and trenched segments where necessary for system integrity, resident safety, and environmental protection.

GLF (primary method): Cable will be placed directly on the ground during winter when the underlying tundra is frozen and snow-covered, allowing it to settle naturally into vegetation during spring thaw. In suitable habitat, the cable is anticipated to become incorporated into the surrounding landscape, similar to the ASTAC ground-lay FOC construction (Figure 2, ASTAC 2024). In areas of little vegetative cover, the cable will not be incorporated into the vegetation.



Figure 2. Photos of the ASTAC GLF one year after placement (July 2023).

GLF waterbody crossings: When it is not possible to avoid a stream or pond, the cable will be placed with adequate slack on the ice surface so it can passively drop to the bottom of the waterbody after the ice thaws. Anchors on either side of the waterbody will secure the cable at the top of banks. The cable will descend into the waterbody under its own weight after ice thaw. The cable is expected to self-bury within aquatic bed sediments. More details are in the Plan of Development (POD).

Cable Anchors: Low-profile anchoring devices with cable grips will be deployed at splice points, elevation transitions, and at regular intervals of up to 6,000 ft. to mitigate lateral cable movement and preserve splice integrity. These ground anchors will also be on either bank of each stream and lake crossing where necessary (except they are not needed for aerial crossings).

Encased splice points: Splices at intervals of roughly 24 miles, or closer as necessitated by site conditions, will be enclosed within a weatherproof enclosure designed to secure and protect the joint where FOCs are interconnected.

Large River Crossings: There are several more complex river crossings that require additional construction techniques:

Aerial crossings: There are large river crossings where the cable will be suspended 20-ft. above the water on wooden poles, which will allow safe passage for boats and wildlife. More information on aerial crossings is detailed in the POD.

Directionally bored crossings: There are complex river crossings where horizontal directional drilling (HDD) method will be utilized in the summer months—but HDD will not be utilized on federal lands. The HDD rig will bury the FOC approximately 4 ft. beneath the riverbed (in 2-in. conduit) by using a locator beacon to drill a pre-planned path and subsequently pulling the FOC through the drilled path.

Subsea crossing: The project includes one to two subsea crossing(s) at Kotzebue Sound/Hothem Inlet, where the FOC will be anchored into concrete beach manholes on either side of the channel and trenched/laid on the seafloor. Details are available in the POD. Best management practices (BMPs) will be implemented throughout the operation to protect the aquatic environment as well as marine life, minimize bank erosion, and avoid creating drainage paths. Construction of the subsea crossing is expected to take 4-12 days.

Trenched segments: Due to high traffic near villages, the cable will be shallowly buried in trenches to reduce the risk to public safety (trip and entanglement hazards) and prevent cable damage. More information on trenching is detailed in the POD. Cultural resource surveys will be conducted in the area of the trenches, and NANA will coordinate with the village tribes as well as the NAB for these surveys, which will occur summer 2026.

Network Operating Center (NOC): The NOC will be located in Kotzebue to manage and monitor the entire system.

Utility poles: The project will tie into existing utility poles to hang ~1.3 miles of FOC as it exits Kotzebue and ~7 miles as it exits Kivalina. Pole access agreements are being initiated as necessary. This multi-use of existing infrastructure here and elsewhere underscores the limited environmental or species disruption of the project as a whole.

Cable Landing Stations (CLS): There will be a CLS in each connected village to house network equipment.

For access to the construction areas, the project will primarily utilize winter trails created by low ground pressure vehicles (LGPVs) with no permanent access roads being constructed. Equipment and materials will be staged at existing facilities in villages, eliminating the need for additional staging areas and thus environmental or species disruption.

During construction, the deployment trains will include mobile sleigh camps to house crews and move along the route as work progresses (Figure 3). Fuel sleighs with 5,000-gallon capacity will travel alongside these mobile camps to provide necessary fuel for equipment and heating (Figure 4). Spill

prevention and mitigation measures will be deployed in compliance with all applicable requirements and best practices. No permanent construction facilities will remain after project completion.



Figure 3: Deployment train



Figure 4: Mobile fuel sleigh contains two 5,000-gallon double-walled tanks

Regarding waste management, all waste materials generated during construction will be transported back to villages for proper disposal. No dedicated waste disposal sites will be created for this project. Hazardous waste will be handled according to all applicable regulations and transported to approved facilities, as detailed in the project's Hazardous Materials and Waste Management Plan.

Regarding wildfire, the HDPE (high density polyethylene) cable is not highly flammable, but it is combustible (PES-TEC, undated). This means that under certain conditions it can catch fire, but it does not ignite easily compared to other materials, and it has a high melting point. In contrast to

polyvinyl chloride, which emits toxic compounds when burned, it burns with less smoke and primarily combusts into carbon dioxide and water (Table 1). It is resistant to many chemicals such as acids, bases, and most organic solvents. This is not regulated as a hazardous good and is rated as a Grade B2 (normally flammable) and HB (indicating a slow horizontal burn with a rate of less than 3 inches per minute, or the flame self-extinguishes before burning 3 inches) for flammability. Off gases when burned at 550°C yield:

Table 1: Off Gases, when burned at 550 C

Off-Gas	mg/g
Carbon Dioxide	1842
Carbon monoxide	312
Methane	18
Ethylene	70
Ethane	11
Propylene	38
Propane	8
1-Butene	19
Butane	6
Trans-2-butene	11
Cis-2-Butene	2
1-Pentene	13
Pentane	3
1,3-Pentadiene	38
1-Hexene	16
2-Hexene	6

2.2 Project Location and Land Use

The proposed 661-mile FOC route connects 8 communities within NAB’s jurisdiction. The project has been carefully designed to minimize environmental and subsistence impacts, including the number and location of waterbody crossings, while ensuring reliable broadband connectivity to all communities.

2.3 Project Timeline

The project will begin with pre-construction activities in Spring/Summer 2025, including cultural resource surveys and barging equipment/supply to Kotzebue during the summer months. Equipment and materials will be staged at villages during Summer/Fall 2025 in preparation for the main construction phase.

Winter construction will commence in January 2026 following personnel mobilization in late December 2025. This will be after the minimum snow depth has accumulated, helping to minimize the impact to vegetation and the landscape. The main FOC ground-lay operations will deploy from two to three separate teams simultaneously: one team starting in Kivalina and working towards Noatak, Noorvik, and Kiana; a second team starting in Kiana and building toward Ambler, Kobuk, Shungnak, and Selawik; and a third team starting in Kotzebue and heading south along the Baldwin Peninsula to Buckland, Deering, and Selawik. This primary GLF installation and aerial stream crossings are expected to be completed by late April 2026 or 2027.

The summer construction phase will begin in May 2026 or when the ice melts, allowing work on subsea and major river crossings utilizing the HDD method as necessary. Subsea crossing construction at Kotzebue Sound will occur during June-July 2026, while HDD river crossings as necessary will be constructed between June and August 2026. During July and August, crews will also conduct aerial-supported cable inspections from the winter construction activities, make seating adjustments where needed, and complete in-village connection work.

The project will enter its completion phase in September 2026 or early 2027, with demobilization and final inspections taking place. System testing and commissioning will follow in 2027, marking the full activation of the broadband network for communities throughout the region.

	2023	2024				2025				2026				2027			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Project Review																	
Environmental Review																	
Permitting Process																	
Preconstruction Activities																	
Winter Construction (after minimum snow cover has accumulated)																	
Summer Construction																	
Testing and Launch																	

Figure 5: Project Timeline

3 Required Permits and Authorizations

Federal permits include a Bureau of Land Management (BLM) Right-of-Way (ROW) grant for construction on BLM lands, a U.S. Fish and Wildlife Service (USFWS) ROW permit for construction on Selawik National Wildlife Refuge, a U.S. Army Corps of Engineers (USACE) Section 404/10 Permit for construction/fill in wetlands and work in Section 10 navigable waterways, and a National Oceanic and Atmospheric Administration (NOAA) NMFS Essential Fish Habitat (EFH) Assessment (Table 2).

At the state level, the project requires an Alaska Department of Natural Resources (ADNR) ROW easement for construction on state land, an ADNR Office of History and Archaeology Section 106 Consultation for National Historic Preservation Act (NHPA) and Alaska Historic Preservation Act compliance, and this Alaska Department of Fish and Game (ADF&G) Title 16 Fish Habitat Permit for crossing state waters.

Local authorizations include a Kikiktagruk Inupiat Corporation (KIC) Land Access/ROW Authorization for construction on KIC lands as necessary, a NANA Regional Corporation Land Use Permit for construction on NANA lands, and a Northwest Arctic Borough Title 9 Permit.

The status of federal authorizations for the project is being tracked through a federal permitting dashboard that will help ensure timelines are met, ultimately enabling the project construction to begin in January 2026.¹ This coordinated permitting approach allows all stakeholders to monitor progress and understand how individual authorizations fit into the overall project timeline. NANA is committed to working diligently with all permitting agencies and landowners to secure timely approvals while ensuring proper environmental protection and stakeholder engagement.

¹ The permitting dashboard, maintained by the Federal Permitting Council under the FAST-41 program can be accessed at: <https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/nana-regional-broadband-network-nrbn>.

Table 2: Listing of state, federal, and local permit applications needed for the project

Agency	Permit/ Authorization	Regulated Activity	Status
Federal			
BLM	ROW Grant	Construction on BLM lands	Submitted
USFWS	ROW Permit	Construction on USFWS land	Submitted
USACE	Section 404 Permit	Construction/fill in wetlands	In progress
USACE	Section 10 Permit	Work in Section 10 Waters	In Progress
FAA	Airspace Obstruction	Construction of structures, aerial lines, etc.	In Progress
NOAA	NMFS EFH Assessment	EFH consultation	In progress
State			
ADNR DMLW/ Northern Region	ROW easement	Construction on state land	Submitted
ADF&G	Title 16 Fish Habitat Permit	Crossing of state waters	Submitted
ADNR OHA/SHPO	Section 106 Consultation	Compliance with NHPA	In progress
Local			
KIC	Land Access/ROW Authorization	Construction on KIC lands	Submitted
NAB	Title 9 Permit	Development within the Borough	Submitted
NANA	Land Use Permit	Construction on NANA lands	In progress

4 Community Engagement and Subsistence Protection

NANA has prioritized meaningful community engagement throughout the project planning process. Between July and October 2024, the project team conducted formal community meetings in all ten villages affected by the project. These meetings included comprehensive presentations on the project scope, timeline, and anticipated benefits, followed by interactive question and answer sessions with community members. During these sessions, residents reviewed detailed maps of the proposed cable routes and provided valuable input on potential adjustments, prioritizing subsistence and customary way of life for these communities. Community concerns and suggestions were meticulously documented to ensure incorporation into the final project design. These meetings were conducted in partnership with tribal and local leadership.

NANA is committed to maintaining robust community engagement and tribal consultation throughout project implementation with a multi-phase approach. Prior to construction in Fall 2025, NANA will conduct updated presentations in all affected communities, distribute detailed construction schedules, share final route plans and construction methodologies, and encourage meaningful engagement with all tribal and community stakeholders. During the construction phases in Winter 2025-2026, Summer 2026, and potentially 2026-2027, NANA will provide updates to all stakeholders and engage in dynamic feedback and information sharing. A contact system for construction supervisors will be maintained, complemented by regular community radio announcements regarding construction progress and a quick response system for addressing any subsistence concerns that arise. Following construction completion, NANA will hold community meetings to gather feedback on construction impact mitigation efforts, present cable inspection and repair protocols, develop long-term community input mechanisms, and host information sessions on broadband service availability.

5 References

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