

NEPA ENVIRONMENTAL ASSESSMENT

PENNSYLVANIA RESEARCH AND EDUCATION NETWORK



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TABLE OF ACRONYMS & ABBREVIATIONS

ACOE	US Army Corps of Engineers
AQI	Air Quality Index
ASCE	American Society of Civil Engineers
BHP	Pennsylvania Historical and Museum Commission Bureau for Historic Preservation
CAP	Competitive Access Provider
CARS	Customer Access Record System
DCNR	Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry
DEP	Pennsylvania Department of Environmental Protection
EPA	Environmental Protection Agency
FPPA	Farmland Protection Policy Act
KINBER	Keystone Initiative for Network Based Education and Research
NAAQS	National Ambient Air Quality Standards
NDS	Pennsylvania Fish & Boat Commission, Division of Environmental Services Natural Diversity Section
PennREN	Pennsylvania Research and Education Network
PGC	Pennsylvania Game Commission
ROW	Rights-of-Way
USFWS	Fish and Wildlife Service of the US Department of the Interior

NEPA ENVIRONMENTAL ASSESSMENT

Pennsylvania Research and Education Network

2.1 EXECUTIVE SUMMARY

The project sponsor is the Pennsylvania Research and Education Network (“PennREN”), a public/private venture for the design, construction and management of fiber optic networks statewide which will offer affordable, enhanced broadband services to Pre-K through 12 and higher education systems, health care networks, libraries, state and local governments and workforce/economic development entities.

PennREN, through its operating entity, KINBER (“Keystone Initiative for Network Based Education and Research”) will serve as the coordinator for the construction and management of a statewide fiber optic network accessible to a host of educational, research, health care and economic development partners seeking to aggregate services for their members and subscribers at affordable cost. The need for a cost-effective networking infrastructure far exceeds what any single entity could procure on its own. By aggregating the service needs of the partners, it will have the ability to negotiate rates lower than those now available.

The PennREN network will reach every region of the Commonwealth with more than 44,000 square miles of coverage. The network will provide in excess of 4,082 miles of direct access to an estimated 5,159,780 individuals in 2,047,442 households and 204,193 businesses within the 10 mile radius of the community anchor institutions.

The network is designed with 13 core nodes at anchor institutions including institutions of higher education that were chosen because of their strong presence in the potential service areas and their willingness to permit all-hours access by nonemployee staff. Each core node will host Ethernet switch and optical transport equipment. The core nodes are supplemented by over 50 local nodes which will not have PennREN-controlled equipment, but are intended as a mechanism to allow broader access to the network via dark fiber.

The project sponsor proposes developing an advanced 48-count fiber network between these key locations across Pennsylvania as a middle mile solution throughout the Commonwealth. The network would encompass approximately 1,696 route miles connecting the strategically positioned nodes to enable access and use of the network for all participating institutions.

The project would implement three fiber rings—one in the west, one in the east and a small metropolitan ring in State College (see the figure included below on page 5 illustrating the high-level fiber design of the network).

The project sponsor will contract with Fibertech Networks and other providers to build and maintain the underlying fiber backbone of the network. Fibertech currently builds and operates metro networks in 11 states across the Northeast, and currently has over 450 fiber route miles in Pennsylvania. Fibertech is a certified CAP (Competitive Access Provider) and has built more unique fiber infrastructure in the Northeast than any other metro network provider.

The fiber network constructed in this project will be either aerial, using existing utility poles within existing Rights-of-Way ("ROW"), or underground, within existing underground conduit systems. A completed engineering survey indicates that approximately 98 percent of the proposed network would be aerial and approximately 2 percent would be within existing conduit that is either underground or affixed to existing structures. No new underground conduit has been proposed. Placement of new underground conduit would only be required in limited instances where the existing conduit proved to be damaged and where no alternative aerial route is feasible. Fibertech would subsequently propose the installation of new underground conduit only in very limited circumstances and only as a last resort. Repair of an existing, damaged conduit may also be considered as an alternative to complete replacement. Like the placement of a new conduit, repair would involve some excavation. If the installation of new conduit is found to be necessary, a defined protocol identified as part of the project description will require identification and consultation with key state agencies prior to any excavation, trenching or disruption.

Cost, schedule constraints, and construction practicalities make completion of a preceding field study at a level of detail sufficient to identify and locate crushed conduit infeasible. The discovery and characterization of crushed or damaged conduit through rodding is a basic part of the construction process and there is no practical means available for obtaining this information in advance of construction.

Although relatively rare, those instances where repair or replacement of an existing conduit could not be avoided would nonetheless present some small risk of an unforeseen or unanticipated environmental impact. A field protocol (see page 18, below) has been defined for immediate implementation in instances where the potential need for repair of an existing segment or placement of a new segment of underground conduit appears. This protocol is intended to ensure that the potential need for conduit repair or replacement would be dealt with in a cost-effective and expedient manner that would simultaneously eliminate the risk of unanticipated negative environmental effects.

Work would also be in conformance with four Conservation and Avoidance Measures within the seven specific areas of concern that have been identified by DCNR as being potential locations for plant species of concern.

Work on two bridges will not take place during the period between March 15th and June 30th so as to minimize any potential disturbance to nesting peregrine falcons. Detailed plans and specifications for the anticipated bridge crossings will be provided for review, comment and final clearance as part of the permitting process within Beaver and Lancaster Counties.

The primary alternatives considered include those related to networks of a different scale, with a different configuration, or a wireless network:

- Although less extensive networks are conceivable, these would necessarily reduce the service area and would, therefore, be more limited in their response to the underlying need for improved access.
- All feasible alternatives included a crossing in the State College area. Alternate networks with fewer rings would provide less protection against a single fiber cut or the loss of a single node.
- Each core network node will host Ethernet switch and optical transport equipment and would be supplemented by over 50 local nodes intended as a mechanism to allow broader access to the network via dark fiber. The institutions of higher education were chosen because of their strong presence in the potential service areas and their willingness to permit all-hours access by nonemployee staff. Alternate networks with fewer nodes, or with different nodes, would be less effective at providing broader access.
- A wireless network alternative could provide a means for data transmission and communication; however, such a network would not provide sufficient capacity or speed for the proposed outcome of the project. The wireless alternative would be much slower than a fiber optic network and a fiber optic network provides great broadband support.

With respect to alternatives, it is significant that (with the possible exception of a dramatically less extensive network), none of those identified above offered the potential for reduced environmental impacts. Virtually any conceivable network configuration would encounter the same potential need for bridge crossings, work on sensitive road shoulders and/or installation of new underground conduit as is the case in the preferred alternative.

Although the question arose regarding a reasonable alternative methodology that would identify the presence of damaged conduit and the associated potential need for new conduit well in advance of construction, all such alternatives were abandoned. In practice, the discovery of damaged conduit is an integral part of the construction process. Alternatives that would identify and locate damaged conduits well in advance of construction would not be feasible or reasonable given the significantly higher costs and schedule delays.

The primary effects upon resources anticipated as possible project outcomes include those to:

- Plant species of concern potentially present on ROW shoulders within seven identified areas;
- Bog turtles potentially present within wetland habitats;
- Peregrine falcons known to inhabit two bridges upon which fiber would be mounted;

- Other unidentified species which might be regionally present in areas where soil disturbance might become necessary to repair or replace damaged conduit;
- Archeological resources which might be regionally present in areas where soil disturbance might become necessary to repair or replace damaged conduit; and,
- Unidentified wetlands or floodplains which might be encountered in locations where it becomes necessary to disturb soils to repair or replace damaged conduit.

The foregoing potential effects have been minimized, and possibly eliminated, by the following project processes and requirements:

- A requirement to avoid ROW shoulders and work from within the paved segments of roads within the seven identified areas;
- A defined process to explore and identify alternate routes that would avoid the need for repair or replacement of existing conduit;
- A requirement to notify a variety of agencies for further consultation and approval should a need for unanticipated disturbance or invasive activities appear; and,
- A requirement to avoid work upon two bridges inhabited by falcons during critical seasons.