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| DESIGN REPORT  AUGUST 2013  Pond Eddy Include General Project Type: Bridge Project  P.I.N. 980389 BIN: 5228710  Route PA S.R. 1011 over the Delaware River  Sullivan County  Town of Lumberland  dad_ MAP_revised |
|  | FHWA%20solid |
| NEW YORK STATE DEPARTMENT OF TRANSPORTATION  ANDREW M. CUOMO, Governor JOAN McDONALD, Commissioner | Flying%20T%20wt2 |

PROJECT APPROVAL SHEET

(Pursuant to SAFETEA-LU Matrix)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **A.** IPP Approval: | The project is ready to be added to the Regional Capital Program and project scoping can begin. | | | | | |
|  | The IPP was approved by: RPPM David Ligeikis | 5/5/1999 | | |  |
|  | | | | |  |
|  | | | | | | |
| **B.** Scope Approval: | The project cost and schedule are consistent with the Regional Capital Program. | | | | | |
|  | The scope was approved by: RPPM David Ligeikis | 5/5/1999 | |  | |
|  | | |  | | |
|  | | | | | | |
| **C.**  Public Hearing Certification (23 USC 128): | A public hearing was not required. | | | | | |
|  |  |  |  | | |
| Design Squad Leader or Project Manager | | |  | | |
|  | A public hearing was not held. | | | | | |
|  |  |  |  | | |
| Regional Director | | |  | | |
|  | | | | | | |
| **D.** Recommendation for Design Approval: | The project cost and schedule are consistent with the Regional Capital Program. | | | | | |
|  |  |  |  | | |
| Regional Program Manager | | |  | | |
|  | | | | | | |
| **E.** Recommendation for Design and Nonstandard Feature Approval: | All requirements requisite to these actions and approvals have been met, the required independent quality control reviews separate from the functional group reviews have been accomplished, and the work is consistent with established standards, policies, regulations and procedures, except as otherwise noted and explained. | | | | | |
|  |  |  |  | | |
| Regional Design Engineer | | |  | | |
|  | | | | | | |
| **F.** Nonstandard Feature Approval: | The nonstandard features have been adequately justified and it is not prudent to eliminate them as part of this project.  OR, No nonstandard features have been identified, created, or retained. | | | | | |
|  |  |  |  | | |
| Regional Director, FHWA OR Deputy Chief Engineer | | |  | | |
|  |  | | | | | |
| **G.** Design Approval: | The required environmental determinations have been made and the preferred alternative for this project is ready for final design. | | | | | |
|  |  |  |  | | |
| Regional Director, FHWA OR Deputy Chief Engineer | | |  | | |

LIST OF PREPARERS

**Group Director Responsible for Production of the Design Approval Document:** Only stamp the final report.

|  |  |
| --- | --- |
| \_\_(Name)\_\_\_\_\_, P.E., Regional Design Engineer, NYSDOT Region \_\_\_  OR  \_\_(Name)\_\_\_\_\_, P.E., Regional Maintenance Engineer, NYSDOT Region \_\_\_  OR  \_\_(Name)\_\_\_\_\_, P.E., Director, Design Services Bureau, NYSDOT  OR  \_\_(Name)\_\_\_\_\_, P.E., Principal, \_\_\_(Consultant firm name)\_\_\_  Description of Work Performed by Firm: Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document. | PLACE P.E. STAMP |

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**This report was prepared by the following NYSDOT staff:**

|  |  |
| --- | --- |
| \_\_(Name)\_\_\_\_\_, P.E., \_\_\_\_\_\_\_\_\_\_\_\_, NYSDOT, \_\_\_\_\_  **Description of Work Performed:**  Prepared the \_\_\_\_\_ for the Design Approval Document in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document.    OR  Description of Work Performed: Directly supervised the preparation of the Final Design Report Chapters 1 through 3 in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document. | PLACE P.E. STAMP |
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# – EXECUTIVE SUMMARY

## 1.1. Introduction

The New York State Department of Transportation (NYSDOT) Region 9 (Southern Tier) working in conjunction with the Pennsylvania Department of Transportation (PennDOT), Engineering District 4-0, and the Federal Highway Administration (FHWA), proposes to address the structural and functional deficiencies of the existing Pond Eddy Bridge. The Pond Eddy Bridge (known locally as the All Veterans Memorial Bridge) is a two-span, pin-connected Pennsylvania (Petit) through truss, constructed between 1904 and 1905 and listed in the National Register of Historic Places (Appendices A-1 – A-4 and E-1). It carries Pennsylvania State Route (S.R.) 1011 over the Delaware River between Shohola Township, Pike County, Pennsylvania, and the Town of Lumberland, Sullivan County, New York (Figure 1). Bridge Inspections have rated the bridge as structurally deficient and functionally obsolete and the bridge currently has a weight limit posting for 7-tons.

For the community of Pond Eddy, Pennsylvania, the bridge is the only egress to the outside world. When new (1905), the bridge was adequate for providing basic services, such as delivery of fuel oil, coal, and firewood, as well as local emergency response services. Over the years, the physical condition of the bridge has deteriorated. Simultaneously, the vehicles providing basic services have increased in size, so much so special arrangements have to be made to supply the community.

The Need for the project is based upon the existing structural and functional deficiencies that currently prevent or limit access over the Delaware River for basic, essential and emergency services. Representatives from Pond Eddy, PA have repeatedly expressed the need to have the bridge repaired or replaced so that access for these types of services can get across the river to Pond Eddy. The PennDOT is mandated under its enabling legislation to provide adequate, safe and efficient transportation facilities for the overall benefit and use by the residents of the Commonwealth. The purpose of the Pond Eddy Bridge Project is to provide a structurally sound bridge to carry S.R. 1011 over the Delaware River. PennDOT must meet other federal and state laws, including Section 4(f) of the USDOT Act of 1966 and its state counterpart, PA Act 120. Section 4(f) affords protection to publicly owned parks, recreation areas, or wildlife and waterfowl refuges, or any significant historic sites. For this project, Section 4(f) resources include the historic Pond Eddy Bridge, the Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail, State Game Land No. 209, and the Delaware State Forest. Project alternatives were developed to meet the project purpose and need and avoid and minimize impacts to Section 4(f) Resources.

Alternatives that were evaluated as part of the project development process consisted of both off-line and on-line alternatives.Off-line alternatives included: a buyout of the Pond Eddy community; an alternative south access route through State Game Lands 209 (SGL 209); alternative access route east to Mill Rift; and an alternative access route southwest to Parkers Glen. None of the off-line alternatives were advanced to detailed analysis due to the inability to meet the purpose and need, environmental impacts, and/or extraordinary costs. The cost of the Buyout option totals $9.5 million and costs for the alternate access routes range from $41 - $45.5 million.

On-line alternatives included: maintaining the bridge in its current condition (the No-Build Alternative); returning the bridge to its original condition (Rehabilitation Option 1); rehabilitating the bridge with strengthening (Rehabilitation Option 2); rehabilitating the bridge with strengthening and widening (Rehabilitation Option 3); replacing the existing bridge; and, adding a new bridge next to the existing bridge, but keeping the old bridge (Dual Bridge Option).

**None of the proposed on-line alternatives could meet the project need and protect the 4(f) resources at a reasonable cost. Bridge Rehabilitation Option 1 would protect the 4(f) historic bridge, but would not meet the purpose and need. The resulting structure would require a posted weight restriction between 15 and 18 tons (which is less than the minimum needed for basic services) and have a limited life expectancy. The local residents and public officials have expressed a need to have safe, efficient access for basic and emergency services. The cost would be substantial ($15.3 million), but require another full rehabilitation in 10-20 years. Finally, Option 1 would have additional engineering issues related to construction logistics and access. Bridge Rehabilitation Options 2 or 3 could meet the project need, but sacrifice the historic fabric of the bridge. Costs for Options 2 and 3 are $16.3 million and $18.5 million respectively, and still would require another full rehabilitation in 10-20 years. As with Option 1, Options 2 and 3 would have additional engineering issues related to construction and access. The Dual Bridge alternative violates the National Park Service’s (NPS) 10-bridge limit management policy for the implementation of Section 7 of the National Wild and Scenic Rivers Act for the Upper Delaware Scenic and Recreational River and negatively impacts recreational boating and flooding of the river.**

The Replacement Alternative, while resulting in a 4(f) “use” (impact), is the best remaining alternative, resulting in the “least overall harm.” A bridge replacement would meet the project need. It would be constructed immediately upstream of existing bridge and provide the safe, efficient access of S.R. 1011 over the Delaware River with a life expectancy of approximately 75 - 100 years (Appendix A-5). Existing access to Pond Eddy would be maintained during construction via the existing Pond Eddy Bridge, thereby avoiding and minimizing impacts to the river by eliminating the need for a temporary access bridge and additional construction causeways. While impacting one 4(f) resource (the historic bridge) this alternative has the least potential impact of the alternatives meeting the project need on the Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail as one of the other major 4(f) resources. The Replacement Alternative best meets the purpose and need of the project, is supported by the NPS and is cost effective; therefore, it would result in the Least Overall Harm.

Section 4(f) not only requires the DOT’s to try to avoid “use” of 4(f) resources, but also to take measures to minimize harm to these resources. Measures to minimize harm to the Pond Eddy Bridge have been developed and implemented through the execution of an approved Memorandum of Agreement (MOA). The mitigation measures include marketing the reuse of the bridge, recordation of the bridge, and the formation of a Pond Eddy Bridge Design Advisory Committee (DAC) to solicit local input on the aesthetics of the Replacement Structure. As part of the DAC process, the DOT’s considered different structure types, alternate span lengths, pier arrangements and aesthetic treatments for selection for the Final Design process. The final design process would include coordination with the National Park Service (NPS), Pennsylvania Fish and Boat Commission (PFBC), and permitting agencies to further avoid and minimize impacts to the Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail.

The project development process, including the Section 106 consultation and the Section 4(f) Evaluation, demonstrates that a number of alternatives have been evaluated for the Pond Eddy Bridge Project, including total Section 4(f) Resource Avoidance Alternatives. Based on the analysis of these alternatives, a feasible and prudent total Section 4(f) Resource Avoidance Alternative does not exist for this project. Of the alternatives studied in detail, the Bridge Replacement Alternative is the alternative that results in the least overall harm to Section 4(f) resources. As part of the Section 106 Memorandum of Agreement, PennDOT in coordination with NYSDOT formed a Design Advisory Committee consisting of local interest groups to solicit input on the bridge type and the aesthetic treatments for the replacement structure. The formation of the DAC consisted of a series of three meetings that resulted in the identification of two bridge types for the DOTs’ consideration along with aesthetic treatments: 2-span truss and 3-span steel girder bridge. The DOT’s considered the DAC options and decided to advance the 2-span truss through the DOT’s final design processes for approval.

23 CFR applies if a federal action is required such as funding or a federal permit.

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This report was prepared in accordance with the NYSDOT Project Development Manual, NYS SEQRA 17 NYCRR Part 15.

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## 1.2. Purpose and Need

### 1.2.1. Where is the Project Located?

Include a project map developed utilizing both ArcMap and snag-it, or similar method. For additional Guidance on ArcMap see Design Section’s [GIS Webpage](http://intradot.nysdot.private/design/gis/gis.html). The minimum mapping information should include (in a text bubble):

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(1) Route number = S.R. 1011, Section 470

(2) Route name = Pond Eddy Bridge

(3) SH number and official highway description = Connects with NY S.R. 97 (SH 1483)

(4) BIN number and feature crossed = #5228710 over the Upper Delaware River

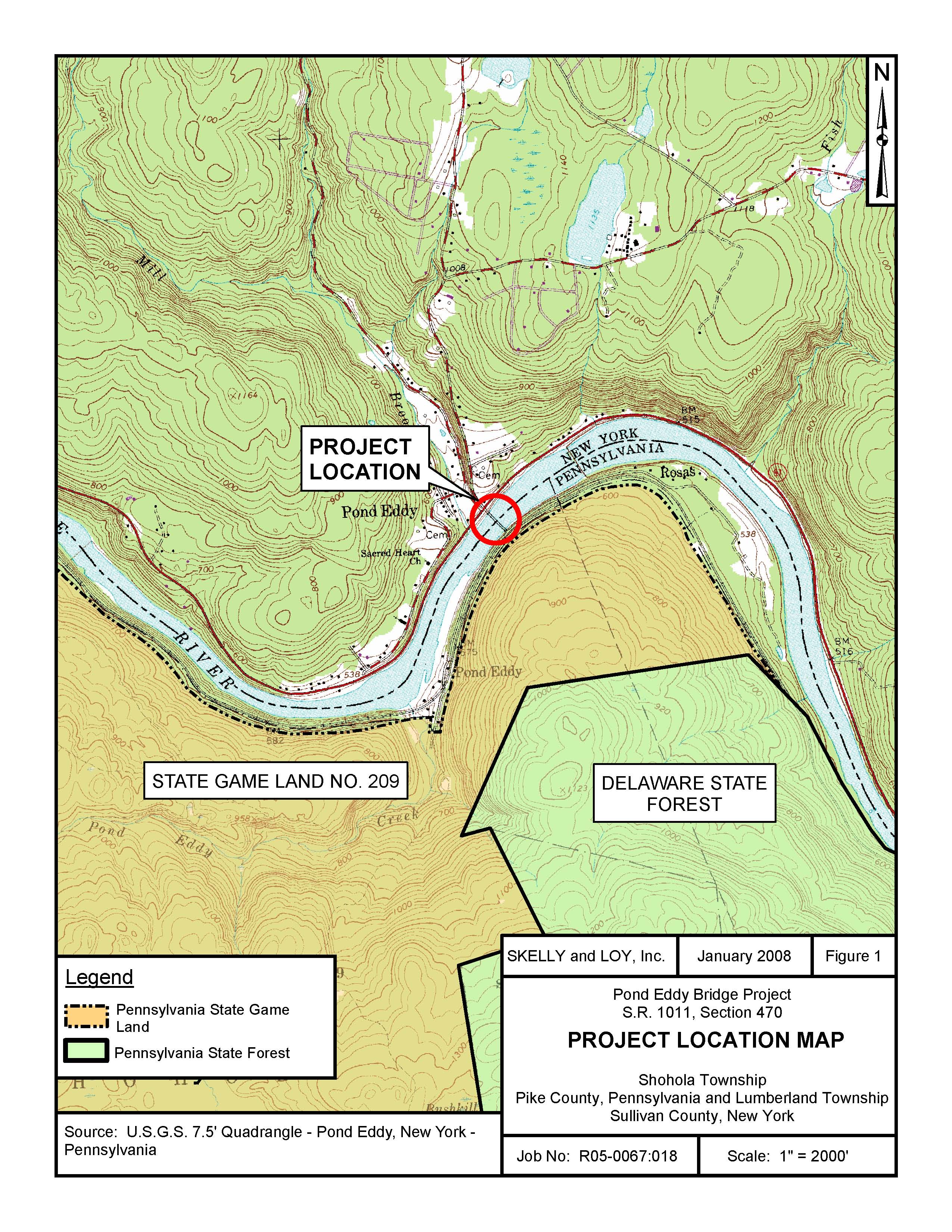
(5) City/Village/Township = Town of Lumberland (NY) and Shohola Township (PA)

(6) County = Sullivan (NY) and Pike County (PA)

(7) Length = 502 feet

(8) From intersection with NY S.R. 97 across Delaware River to PA S.R. 1011





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### 1.2.2. Why is the Project Needed?

The Pond Eddy Bridge serves as the only access to the community of Pond Eddy, Pennsylvania. Bridge inspections conducted since the early 1990’s have revealed that the Pond Eddy Bridge has major structural and functional deficiencies which present potential safety concerns and serve to limit vehicular access to Pond Eddy. As such, the Purpose and Need for the project is a two-pronged statement whereby:

The purpose of the Pond Eddy Bridge Project is to provide a structurally sound bridge to carry S.R. 1011 over the Delaware River. The need for the project is based on the existing structural and functional deficiencies that currently prevent or limit adequate access over the Delaware River for Pond Eddy, Pennsylvania.

Built in 1904/05, the Pond Eddy Bridge was designed to carry a maximum load of 18 tons. This 18-ton weight limit was acceptable for many years and allowed homeowners to receive basic services including the delivery of fuel oil, coal and firewood, as well as local emergency response services (i.e., police, fire and ambulance). However, over the past hundred years of service, the physical condition of the Pond Eddy Bridge has slowly deteriorated to the point that it can no longer safely carry its original 18-ton load limit. It is currently posted for a maximum vehicle loading of 7 tons, which is less than half of its original load carrying capacity. In addition, vehicle loads have increased substantially since 1904. For comparison, current emergency and basic vehicles have loading rates in excess of 20 tons. This divergence of what the Pond Eddy Bridge is physically capable of carrying versus the increased load ratings of modern vehicles has resulted in a bridge structure that does not serve the function for which it was originally constructed.

Identify and describe transportation needs and/or respective concerns which the proposed action is intended to satisfy (e.g., provide system continuity, alleviate traffic congestion~ and correct safety or roadway deficiencies). In many cases the project need can be adequately explained in one or two paragraphs.

### 1.2.3. What are the Objectives of the Project?

See Project Development Manual [Appendix 4](https://www.nysdot.gov/portal/page/portal/divisions/engineering/design/dqab/dqab-repository/pdmapp4.pdf) when establishing project objectives. Project objectives are what the project is meant to accomplish; the desired results of the project; the outcomes of the project that meet the identified needs or remedy stated problems. Therefore, objective(s) will be unique to each project.

Project objectives provide evaluation criteria (measures of effectiveness) for comparing how well alternative solutions fulfill identified needs. Objectives should be listed or grouped in order of importance. When the objectives do not completely satisfy identified needs, an explanation should follow.

A proper statement of project objectives has several characteristics. The statements should include the following:

* Describes the desired results of the project in a manner that is appropriately specific.
* Is consistent with available resources
* Gives time frames for achievement
* Allows achievement to be measured

*NOTE: If the proposed project would also assist in accomplishing other objectives not directly identifiable as part of the problem(s), these should be described as well.*

Objectives must be specified such that design alternatives can be evaluated against these objectives. Objectives should not define or state specific solution(s) to the problem but should define goal(s) the alternatives are striving to meet. Some examples are listed below.In addition to the project purpose and need, and due to the unique circumstances of the project area, FHWA, PennDOT and NYSDOT identified “project objectives” to be achieved with the bridge improvement project. They are as follows:

Maintain access at all times for emergency services, school buses, and other goods and services to the isolated community of Pond Eddy,

Maintain access to the Upper Delaware Scenic and Recreational River,

Maintain access to the active Norfolk Southern rail line,

Maintain access to State Game Land 209 and the Delaware State Forest,

Design a solution in harmony with the characteristics of the general surroundings,

Design a solution respectful of the National Park Service’s Management Plan for the Upper Delaware River and its scenic and recreational values, the NYS Route 97 – Upper Delaware Scenic Byway, and

Design a solution that is financially achievable within the project’s current budget.

On projects where a law, Executive Order or regulation (e.g.~ Section 4(f), Executive Order 11990 or Executive Order 11988) mandates an evaluation of avoidance alternatives, the explanation of the project objective should be more specific so that avoidance alternatives that do not meet the stated project objective can be readily dismissed.

## 1.3. What Alternative(s) Are Being Considered?

This section should provide a brief description of the alternatives (that are reasonable and most closely meet the objectives) that are or have been considered, supplemented by a presentation style typical section(s). The no-build/maintenance alternative should be considered and discussed briefly. Profiles should generally not be included in this chapter. Presentation style plans should be included for realignments, interchange reconfigurations and major intersection work.

When there are numerous alternatives, different colors for each alternative may be useful. More in-depth information/data will be provided in Chapter 3, which will also cover the alternatives that were deemed infeasible (eliminated from further study).

For projects with numerous alternatives, the alternatives considered and rejected should be included in an appendix and referenced in this section.

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An in-depth evaluation of alternatives was undertaken as part of the project development process. Both off-line and on-line alternatives were evaluated and documented in the Individual Section 4(f) Evaluation Report, approved January 2012 (Appendix B-1). The off-line alternatives were not considered feasible and not considered in the detailed evaluation of alternatives. On-line project alternatives and sub alternatives were developed to meet the project objectives. The following alternatives and sub alternatives were evaluated as part of the project development process:

Alternatives Considered in Detail

1. Total Section 4(f) Avoidance Alternatives

i. No Build

ii. Rehabilitation

2. Other Alternatives Considered in Detail

i. Bridge Replacement including

a. 4-Span Concrete Bridge

b. 3-Span Steel Bridge

c. Modified 2-Span Truss

ii. Rehabilitation with Strengthening and/or Widening

a. Rehabilitate and Strengthen Bridge to HS-20 Capacity

b. HS-20 Loading with Deck Widening

The alternatives considered in detail are further described in Chapter 3 of this report. Bridge replacement was determined to be the practical and feasible alternative for the project.

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## 1.4 How will the Alternative(s) Affect the Environment?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Exhibit 1.4-A  Environmental Summary | | | | | |
| NEPA Classification | CEE, Level II |  | FHWA | Date |  |
| SEQR Type: | Non-Type II (EA) | BY |  | Date | 11/2/2010 |

| Exhibit 1.1-B – Environmental Impacts | | | | | |
| --- | --- | --- | --- | --- | --- |
| Category | No-Build | Rehabilitation | Replacement-Two Span Truss3 | Replacement –Three Span Steel |
| Wetland impacts | None | 0.2 acres | 0.2 acres | 0.2 acres |
| 100 year floodplain impact | None | 1 acres | 1 acres | 1 acres |
| Waterway  Impacts | 0 | 91,500 sq ft Temporary impacts | 91,500 sq ft Temporary impacts  11,925 sq ft permanent span impacts  90 sq ft permanent pier impacts | 91,500 sq ft Temporary impacts  11,925 sq ft : permanent span impacts  180 sq ft: permanent pier impacts |
| Archeological Sites Impacted | None | None | None | None |
| Noise | None | None | None | None |
| Impact to forested areas | None | 0.1 acres | 0.1 acres | 0.1acres |
| Noise Impacts | None | None | None | None |
| Construction Cost | None | $24.1M | $17.4M | $13.5 |

PennDOT proposes to replace the existing Pond Eddy Bridge in coordination with NYSDOT. Bridge replacement will result in an adverse effect to the historic truss bridge structure. The adverse effect has been mitigated through the execution of a Memorandum of Agreement (MOA) for the project. The replacement will avoid and minimize impacts to the Upper Delaware River. A Design Advisory Committee was formed to solicit local input on the replacement type and aesthetic appearance for the new bridge. The result of the DAC was the identification of two bridge types that were recommended for the crossing location, including a modified 2-Span truss bridge and a three span steel haunched girder bridge.

Related Links: [NEPA Checklist](https://www.nysdot.gov/portal/page/portal/divisions/engineering/design/dqab/dqab-repository/PDM%20Appendix%207%20-%20x%20DR%20B%20-%20RPT_DDR_ENV_NEPA_checklist.doc)

The above table should be modified to include the items that help differentiate between the alternatives (including the null alternative).   For example, load rating might be a row for a bridge project and tons of air pollutants for a capacity improvement project.

Refer to Chapter 4 for mitigation measures that are proposed for this project.

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Anticipated Permits/Certifications/Coordination: (Briefly list along with the status of any anticipated permit(s), certification(s) and coordination required for the project. Refer to applicable chapter 4 Sections for additional in-depth information regarding the permits/certifications/coordination.)

NYSDEC

State Pollutant Discharge Elimination System (SPDES) General Permit

Floodplain Variance

Water Quality Certification (Sec 401) of the FWPCA

NYSDEC - Protection of Waters permit

PA DEP

Chapter 105 wetland and waterway encroachment permit

USACOE

U.S. Army Corps of Engineers, Section 404 Nationwide Permit #3 - Maintenance Activities in all Waters of the U.S.

Coordination

Coordination with NYSDEC pursuant to the “NYSDEC/NYSDOT Memorandum of Understanding Regarding ECL Article 15 & 24

Coordination with Federal Highway Administration

Coordination with New York State Historic Preservation Officer (SHPO)

Coordination with the US Fish and Wildlife Service

Coordination with the New York Natural Heritage Program

Coordination with NPS for Wild Scenic and Recreational Rivers Permit

Coordination with PA Fish and Boat Commission on Water Trail

Others

Construction Staging Permit

Local Permits

Delaware River Basin Commission Docket Authorization

## 1.5. What Are The Costs & Schedules?

Refer to PPMIS software for the initial cost and schedule. During scoping, the designer is to develop costs and a schedule using accepted practices such an itemized estimate based on bid histories and MS Project. A MS Project schedule and an excel spreadsheet with the cost estimates is to be maintained in ProjectWise. When meeting the desired Let date is critical, a statement to that affect will be in­cluded in the body of the PSR/FDR together with an explanation. Similarly, if there is flexibility in the schedule that will also be explained in the body of the PSR/FDR. Scheduler qualifiers such as utility involvement, ordering steel for bridges, cultural resource requirements, special local events etc. should be described.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Design Approval is scheduled for February 2014 with Construction scheduled to last 15-24 months beginning in July 2015.

| Exhibit 1.5  Project Schedule | |
| --- | --- |
| **Activity** | **Date Occurred/Tentative** |
| Scoping Approval | May 1999 |
| Design Approval | Summer 2013 |
| ROW Acquisition (complete) | July 2014 |
| Construction Start | July 2015 |
| Construction Complete | December 2016 |

| Comparison of Alternatives and Project Costs (Millions) | | | | | |
| --- | --- | --- | --- | --- | --- |
| Activities | | Alternate 1 | Alternate 2 | Alternate 3 | Alternate 4 |
| No Build | Rehabilitation to 18 Ton Capacity | 3-Span Steel | 2-Span Modified Truss |
| Construction Costs | Approach | Buyout | Rehab | Replace | Replace |
| Bridge | 9.6 million | 15.3 M | 8.55 M | 10.82 M |
| Wetland Mitigation Costs | | NA | NA | NA | NA |
| SPDES Mitigation Costs | | NA | NA | NA | NA |
| Incidentals 10% | | 960,000 | 1,530,000 | 855,000 | 1,102,000 |
| Subtotal (2013 Dollars) | | $10,560,000 | $16,830,000 | $9,405,000 | $12,122,000 |
| Contingency (15% @ Design Approval) | | $1,584,000 | $2,524,500 | $1,410,750 | $1,818,300 |
| Subtotal (2013 Dollars) | | $12,144,000 | $19,354,500 | $10,815,750 | $13,940,300 |
| Field Change Order (5%) | | $607,200 | 967,725 | 540,788 | 697,015 |
| Subtotal (2013 Dollars) | | $12,751,200 | $20,322,225 | $11,356,538 | $14,637,315 |
| Mobilization (4%) | | $510,048 | $812,889 | $454,262 | $585,493 |
| Subtotal (2013 Dollars) | | $13,261,248 | $21,135,114 | $11,810,800 | $15,222,808 |
| Expected Award Amount (Inflated @ 5%/yr to midpoint of construction (2013 Dollars)) | | $663,062 | $1,056,756 | $590,540 | $761,140 |
| Construction Inspection (9%) | | $1,193,512 | $1,902,160 | $1,062,972 | $1,370,053 |
| ROW Costs | | NA | NA | 50,000 | 50,000 |
| **Total Project Costs** | | $15,117,822 | $24,094,0301 | $13,514,312 | $17,404,001 |

1: Per FHWA regulations, Projects with total costs greater than $25 million requires a design Value engineering review.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## 1.6. Which Alternative is Preferred?

The following statement should be included in non EIS projects:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The feasible and prudent alternative that best meets the project purpose and need is the Bridge Replacement Alternative. A final decision to enter Final Design will not be made until after the environmental determination and evaluation of the comments on the draft design approval document.

This section should include a brief rationale for if a preferred alternative has been selected.

## 1.7. Who Will Decide Which Alternative Will Be Selected And How Can I Be Involved In This Decision?

NYSDOT in conjunction with PennDOT and FHWA will determine the selected alternative for the project and each entity will be required to provide the appropriate project authorization through their respective project approval processes. There has been much public and stakeholder involvement through the development of this project, including three public meetings. Additionally, PennDOT has also conducted three separate Consulting Party meetings for the project (June 29, 2005, August 23, 2007, and April 7, 2009), of which the State Historic Preservation Offices (SHPOs), Advisory Council for Historic Preservation (ACHP), and NPS have been party to (Appendix G). Subsequent to the April 7, 2009, Consulting Party Meeting, PennDOT and FHWA conducted a project-specific coordination meeting with the ACHP on May 5, 2009, to discuss unresolved issues related to the Section 106 process. Additionally, project-specific coordination meetings were held with the NPS on April 24, 2007 and July 25, 2011, to discuss issues related to the Bridge Replacement’s use of the Upper Delaware Scenic and Recreational River (Appendix G). As part of the Section 106 Memorandum of Agreement, PennDOT formed a Design Advisory Committee consisting of local interest groups to solicit input on the bridge type and the aesthetic treatments for the replacement structure. The formation of the DAC consisted of a series of three meetings that resulted in the identification of two bridge types for the DOTs’ consideration along with aesthetic treatments: 2-span truss and 3-span steel girder bridge. The DOT’s considered the DAC options and decided to advance the 2-span truss through the DOT’s final design processes for approval.

This section should reference pertinent copies of correspondence with federal, state and local agencies in addition to the public. This section should summarize:

* Early coordination process.
* Scoping Meetings.
* Meetings with community groups (including minority and non-minority interests) and individuals.
* Identify key issues and pertinent information received from the public and government agencies through these efforts.

This section of the report should explain how the project has evolved to its current status. Public Involvement needs to occur during scoping, not just after. In fact, it is part of the scoping process. Discuss any Public meetings that have been held. Discuss areas of controversy (including issues raised by agencies and the public).

Establish contacts with potentially involved Parties such as:

* Applicable State & Federal agencies (e.g., NYSDEC, ACOE, NYSTA, SHPO, FHWA, MPO)
* Commuters
* Local elected officials
* Local property owners
* Emergency services
* Businesses
* Chamber of commerce
* Schools

Additional information can be found in the [Public Involvement Manual](https://www.nysdot.gov/portal/page/portal/divisions/engineering/design/dqab/dqab-repository/pdmapp2.pdf) located in the Project Development Manual Appendix 2. PDM Section 2. 2.6.3.

Include a description of any major actions proposed by other governmental agencies in the same geographic area as the proposed project.

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| Exhibit 1.7  Public Involvement Plan Schedule of Milestone Dates | |
| --- | --- |
| Activity | Date Occurred/Tentative |
| Pre-Scope Environmental Findings |  |
| Field Pre-Scoping Meeting (all groups) |  |
| In-house DOT Scoping Meeting |  |
| Stake holder Meeting | April 2009 |
| Focus Group Meeting | April 2009 |
| Meeting with Town Reps. | April 2009 |
| Meeting with SHPO | February 2011 |
| Public Informational Meeting | Spring-Summer 2013 |
|  |  |
| Current Project Letting date | June 2015 |

Refer to Appendix G for Public Involvement (PI) Plan and Input from Stakeholders including Public.

You may offer your comments in a variety of ways.

There will be a Public Meeting scheduled in late summer – early fall 2013, where you can talk to Department representatives and provide written comments.

You can contact: Mr. Dave MacEwan, Project Manager. Please include the six digit Project Identification Number (PIN) 980389.

Questions or comments: Email: [Dave.MacEwan@dot.ny.gov](mailto:dmacewan@dot.state.ny.us)

Telephone: (607) 721-8270

Mailing Address

New York State Department of Transportation

Region 9 Planning and Program Management

44 Hawley Street

Binghamton, NY 13901

The deadline for submitting comments on this report circulation is December 2013. The remainder of this report is a detailed technical evaluation of the existing conditions, the proposed alternatives, the impacts of the alternatives, copies of technical reports and plans and other supporting information.

# – PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

This chapter addresses the history and existing context of the project site, including the existing conditions, deficiencies, and needs for the Pennsylvania S.R. 1011, Section 470 bridge (BIN 5228710) crossing over the Upper Delaware River. This project is referred to as the Pond Eddy Bridge Project.

## 2.1. Project History

The Pennsylvania Department of Transportation (PennDOT), Engineering District 4-0, working in cooperation with the New York State Department of Transportation (NYSDOT) Region 9 proposes to address the structural deficiencies of the existing Pond Eddy Bridge through the implementation of a bridge improvement project. Constructed between 1904 and 1905, the existing Pond Eddy Bridge (known locally as the All Veterans Memorial Bridge) carries Pennsylvania State Route (S.R.) 1011 over the Delaware River between Shohola Township, Pike County, Pennsylvania, and the Town of Lumberland, Sullivan County, New York (Figure 1), via a two-span, pin-connected, Pennsylvania (Petit) through truss. The Pond Eddy Bridge Project involves providing a safe, structurally sound means for crossing the Delaware River to access the isolated community of Pond Eddy, Pennsylvania.

The Pond Eddy Bridge was listed on the National Register of Historic Places on November 14, 1988, as a representative example of a multiple span Pennsylvania (Petit) truss bridge. As such, the Pond Eddy Bridge qualifies as a Section 4(f)-protected resource. Additionally, there are several other Section 4(f)-protected resources located within the general project area, including

Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail,

State Game Land No. 209, and

a portion of the Delaware State Forest (Figure 1).

The Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail is under the administrative jurisdiction of the National Park Service (NPS) and the Pennsylvania Fish and Boat Commission (PFBC), respectively. Similarly, State Game Land No. 209 is subject to the administrative jurisdiction of the Pennsylvania Game Commission (PGC), and the Delaware State Forest falls under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (DCNR).

The Pond Eddy Bridge serves as the only access over the Delaware River to the community of Pond Eddy, Pennsylvania. The bridge provides access from NY State Route 97 across the Upper Delaware River. NY State Route 97 is a state designated Scenic Byway. The project area is characterized as a rural mountainous river valley with steep river banks and a mature forested landscape along the valley outslopes. The Upper Delaware River is approximately 500 feet wide and contained within deep river banks, extending approximately 20 to 25 feet in elevation. The rural mountainous terrain coupled with the breadth of the Delaware River contributes to the isolated nature of Pond Eddy, Pennsylvania. Residents of Pond Eddy, Pennsylvania, must use the bridge to access their properties. The bridge also provides access to Pennsylvania State Game Lands 209 and the Delaware State Forest.

Bridge inspections conducted since the early 1990s have revealed that the Pond Eddy Bridge has major structural and functional deficiencies which present potential safety concerns and serve to limit vehicular access to Pond Eddy. Bridge Inspection reports are available at the PennDOT District 4-0 office.

The purpose of the Pond Eddy Bridge Project is to provide a structurally sound bridge to carry S.R. 1011 over the Delaware River. The need for the project is based on the existing structural and functional deficiencies that currently prevent or limit adequate access over the Delaware River for Pond Eddy, Pennsylvania.

A. CONDITION OF POND EDDY BRIDGE

Built in 1904-1905, the Pond Eddy Bridge was designed to carry a maximum load of 18 tons. This 18-ton weight limit was acceptable for many years and allowed homeowners to receive basic services including the delivery of fuel oil, coal, and firewood as well as local emergency response services (i.e., police, fire, and ambulance). Over the past 100 years of service, the physical condition of the Pond Eddy Bridge has slowly deteriorated to the point that it can no longer safely carry its original 18-ton load limit. It is currently posted for a maximum vehicle loading of seven tons, which is less than half of its original load carrying capacity. In addition, vehicle loads have increased substantially since 1904. For comparison, current emergency and basic vehicles have loading rates in excess of 20 tons. For example, the Shohola fire trucks range from 20 to 26 tons. This divergence of what the Pond Eddy Bridge is physically capable of carrying versus the increased load ratings of modern vehicles has resulted in a bridge structure that does not serve the function for which it was originally constructed.

In October 2006, PennDOT completed Safe Load Capacity and Load Rating Analyses on the bridge. The outcome of those analyses resulted in PennDOT reducing the bridge’s carrying capacity from eight to three tons due to the advanced state of structural deterioration. These structural deficiencies presented potential safety concerns and further reduction of access to Pond Eddy by almost any vehicle larger than a typical passenger car. This weight restriction resulted in PennDOT issuing an emergency contract to replace ten severely deteriorated floor beams beneath the bridge deck as well as several wooden deck planks. This partial rehabilitation was completed in December 2006 and resulted in the bridge’s posted weight capacity being reassigned to seven tons. Due to the seven-ton weight restriction, as with the eight-ton restriction mentioned above, emergency response vehicles and most trucks (fuel, propane, and coal) still cannot legally use the bridge. To maintain this seven-ton load capacity, pier repairs were completed in 2010 at a cost of $250,000 to remedy damage to the pier nosing and subsequent undermining of the pier. In 2011, 64 stringers were repaired at a cost of $500,000.

Based on the advanced state of structural deterioration, the existing Pond Eddy Bridge has been classified as “structurally deficient.” The term structural deficiency refers to the physical integrity of the various components of a bridge in relation to the load carrying capacity for which it was designed or engineered. By definition, a structurally deficient bridge is safe but is in need of significant repairs or replacement to bring it to current standards. In regard to the Pond Eddy Bridge, the three major bridge components that factor into the structural deficiency determination are the deck, substructure, and superstructure. PennDOT’s bridge rating system, as outlined in Publication 100A, rates bridge conditions over a scale of 0 to 9 with a rating of 9 for excellent condition and 0 for failed condition. All three of these bridge components have a condition rating of 3, which is indicative of advanced deterioration. Additionally, FHWA’s bridge sufficiency rating formula provides a percentage rating scale with 100% representing an entirely sufficient bridge and 0% representing an entirely insufficient or deficient bridge. As a whole, the Pond Eddy Bridge has an overall sufficiency rating of 20%, which automatically qualifies it for replacement or repair. The bridge is classified as structurally deficient as a result of the low sufficiency rating.

Additionally, the existing bridge is classified as “functionally obsolete” due to a posted height restriction and a substandard single-lane deck width. Specifically, the bridge is a through-truss structure with limited vertical clearance of 13'6" and a single-lane deck width of only 14'10". These existing bridge features are considered substandard by National Bridge Inspection Standards. The substandard deck width (single-lane crossing) forces vehicles to yield to oncoming traffic to avoid the potential risk of a head-on collision. While the rural nature of the project area and low average annual daily traffic (AADT) may limit the overall severity of these bridge deficiencies, they are, and will remain, conditions that present potential safety and access concerns for the traveling public until corrective actions are implemented. The limited width also requires the existing bridge to be closed to traffic when maintenance, repairs or rehabilitation are performed.

B. ACCESS TO THE VILLAGE OF POND EDDY

Pond Eddy, PA consists of approximately 24 properties encompassing 2 municipalities; Shohola and Westfall Townships. The Pond Eddy Bridge is the lone access across the Delaware River to the community. The Pond Eddy, PA residents use this bridge to travel to school, work, and stores. Representatives from the community have repeatedly expressed the need to have the bridge repaired or replaced so that basic access and essential services can get across the river to Pond Eddy. This has been demonstrated in numerous public meetings, meeting responses, and in continued personal telephone calls from local residents. The residents of Pond Eddy, PA have stated that their needs include access for emergency service, fuel supply, concrete, septic maintenance, road maintenance, and other basic service delivery vehicles. Through the many coordination efforts with the local constituency, PennDOT has evaluated weights for vehicles that typically provide emergency and basic services.

| Type of Vehicle | Curb Weight (Tons) | Weight of Materials (Tons) | Gross Vehicle Weight (Tons) |
| --- | --- | --- | --- |
| Sedan | 1.68 | 0.00 | 1.68 |
| Mid-size SUV | 3.25 | 0.00 | 3.25 |
| Mini school bus | 4.80 | 0.00 | 4.80 |
| Full size school bus | 10.07 | 5.47 | 15.54 |
| Ambulance | 3.82 | 2.42 | 6.24 |
| Fire Truck | 20.00 | 20.85 | 40.85 |
| Fuel Tanker | 12.82 | 16.33 | 29.15 |
| Single Axle Dump Truck | 8.75 | 10.25 | 19.00 |
| Tri Axle Dump Truck | 12.50 | 26.00 | 38.50 |
| Small Excavator | 5.21 | 0.00 | 5.21 |
| Mid-size Rubber Tire Excavator | 12.68 | 0.00 | 12.68 |
| Concrete Truck | 12.50 | 20.00 | 32.50 |
| Garbage Truck | 6.94 | 17.50 | 24.44 |
| Well Drilling Rig | 24.50 | 0.00 | 24.50 |

C. SUMMARY OF PURPOSE AND NEED

Structural and functional deficiencies exist with the Pond Eddy Bridge and these deficiencies present potential safety and access concerns for the traveling public to cross the Delaware River. Without improvements, the existing bridge will continue to deteriorate and will eventually require more stringent weight limits to the point that the bridge would be closed to vehicular traffic. The dependability of the structure would become questionable, and safety and access for the traveling public would be compromised. This concept is inconsistent with PennDOT’s mandate under PA Act 120 to provide adequate, safe, and efficient transportation facilities for the overall benefit of and use by the residents of the Commonwealth. As such, the purpose of the Pond Eddy Bridge Project is to provide a structurally sound bridge to carry Pennsylvania S.R. 1011 over the Delaware River. The Need for the project is based upon the existing structural and functional deficiencies that currently prevent or limit access over the Delaware River for basic, essential and emergency services. Representatives from Pond Eddy, PA have repeatedly expressed the need to have the bridge repaired or replaced so that access for these types of services can get across the river to Pond Eddy.

In addition to the project needs and due to the unique circumstances of the project area, FHWA and PennDOT identified “project objectives” to be achieved with the bridge improvement project. They are as follows.

Maintain access at all times for emergency services, school buses, and other goods and services to the isolated community of Pond Eddy

Maintain access to the Upper Delaware Scenic and Recreational River

Maintain access to the active Norfolk Southern rail line

Maintain access to State Game Land 209 and the Delaware State Forest

Design a solution in harmony with the characteristics of the general surroundings

Design a solution respectful of the National Park Service’s Management Plan for the Upper Delaware River and its scenic and recreational values, and

Design a solution that is financially achievable within the project’s current budget

## 2.2. Transportation Plans and Land Use

### 2.2.1. Local Plans for the Project Area

#### 2.2.1.1. Local Master Plan –

The local township of Shohola, PA and the Town of Lumberland, NY have participated in the public involvement components of the project and have issued their support of a bridge improvement project. The Town of Lumberland, New York and the Town of Shohola, Pennsylvania both have adopted local Comprehensive Master Plans. The Town of Lumberland’s plan describes Pond Eddy, New York, as a hamlet in the town and lists the Pond Eddy Bridge as one of its assets to be highlighted and improved. The Plan also discusses improving the access to the Eagle’s Nest nature trails located across the bridge on the Pennsylvania side of the Delaware River.

The Lackawaxen Township and Shohola Township Multi-Municipal Comprehensive Plan was reviewed. The only mention of the Pond Eddy Bridge was in a table citing the proposed Bridge Replacement project. There was no mention of the existing bridge or community found within the Plan.

#### 2.2.1.2. Local Private Development Plans –

There are no approved developments planned within the project area that will impact traffic operations.

### 2.2.2. Transportation Corridor

#### 2.2.2.1. Importance of the Project Route Segment –

The Pond Eddy Bridge provides the sole access across the Delaware River for Pond Eddy Pennsylvania.

#### 2.2.2.2. Alternate Routes –

There are no other public or township routes of access across the Delaware River to Pond Eddy, Pennsylvania. There are no alternate routes that would be suitable as a permanent detour.

#### 2.2.2.3. Corridor Deficiencies and Needs –

The existing bridge is deteriorated and in need of structural improvements. Access across the Delaware River is limited by the current posted capacity (7 tons) of the existing bridge. The weight restriction limits the access of basic and emergency services across the Delaware River.

#### 2.2.2.4. Transportation Plans –

The Pond Eddy Bridge Project is identified on the Transportation Improvement Plan (TIP) for both Pennsylvania and New York. The Pond Eddy Bridge is under the management control of both the Pennsylvania Department of Transportation and New York State Department of Transportation through the Interstate Bridge Commission. Through the Interstate Bridge commission, PennDOT serves as the lead DOT agency for the project but works in conjunction with NYSDOT.

#### 2.2.2.5. Abutting Highway Segments and Future Plans for Abutting Highway Segments –

The Pond Eddy Bridge connects with S.R. 97 in New York, along the Delaware River. The proposed bridge replacement will require a minor modification of the existing intersection with S.R. 97, C.R. 41 (High Road), and Hollow Road. The proposed bridge improvements will maintain current grade and clear zone conditions. The connecting roads on the Pennsylvania side of the river include PA state Route 1011 (Flagstone Road) and Rosa Road (local township road).

## 2.3. Transportation Conditions, Deficiencies and Engineering Considerations

### 2.3.1. Operations (Traffic and Safety) & Maintenance

#### 2.3.1.1. Functional Classification and National Highway System (NHS) –

The NYSDOT Bridge Manual Section 2.4 for the vertical clearance network indicates that the minimum clearance for new, replacement bridges on non-NHS systems is 14’.

|  |  |  |
| --- | --- | --- |
| Exhibit - 2.3.1.1  Classification Data | | |
| Route | S.R. 1011 | S.R. 97 |
| Functional  Classification | Local Rural | Major Collector (Rural) |
| National Highway System (NHS) | No | No |
| Designated Truck Access Route | No | No |
| Qualifying  Highway | No | No |
| Within 1.6 km of a Qualifying Highway | No | No |
| Within the 4.9 m vertical clearance network | No | No |

#### 2.3.1.2. Control of Access –

New York S.R. 97 and the local roads on the PA side are not access-controlled highways. There are several commercial and residential driveways along these roads in the vicinity of the project.

#### 2.3.1.3. Traffic Control Devices –

There are no existing traffic signals within the project limit or within one half mile of the abutting roadway segments.

Traffic control at the existing bridge includes a stop sign on PA S.R. 1011 at the intersection with NY S.R. 97; Yield Signs at the S.R. 1011 bridge entrances on both the PA and NY sides of the river, along with single lane, weight restriction and height clearance signage.

#### 2.3.1.4. Intelligent Transportation Systems (ITS) –

There is no ITS system in operation or planned for the project area.

#### 2.3.1.5. Speeds and Delay –

The posted speed limit for the single lane Pond Eddy Bridge crossing is 10 miles per hour.

#### 2.3.1.6. Traffic Volumes –

The latest available traffic data was obtained in July 2005. The Average Annual Daily Traffic (AADT) is 61 vehicles per day (vpd), based upon machine counts completed in July 2005. Based on an annual growth rate of 1.5% the projected 2013 traffic counts are AADT of 68 vpd. The most common traffic movement is from the bridge to southbound S.R. 97. The other common movement is a through movement from the bridge to C.R. 41/Hollow Road associated with regular trips to the post office, which is located along C.R. 41 approximately 1,300 feet north of NYS Route 97. The traffic volumes do not warrant a need for a traffic signal. A stop condition at both ends of the bridge is warranted for both PA and NY intersections. Supporting traffic information is provided in Appendix C-1.

#### 2.3.1.7. Level of Service and Mobility

2.3.1.7. (1) Existing level of service and capacity analysis – There are approximately 30 cars a day that use the Pond Eddy bridge. The crossing operates at a level of service C or better.

2.3.1.7. (2) Future no-build design year level of service –The existing structure is posted at a 7-ton weight limit and has experienced extensive repair over the past four years. Should the existing crossing structure continue to deteriorate, then it will eventually be closed.

#### 2.3.1.8. Safety Considerations, Accident History and Analysis –

The existing Pond Eddy Bridge is severely deteriorated and structurally deficient. Bridge use is restricted to vehicles of less than 7 tons. Bridge improvements are needed to provide safe access on S.R. 1011 across the Delaware River. The existing bridge is a single-lane structure, which requires alternating one-way movements of vehicles.

There are no high accident locations within the study area. A FOIL request was made to the Records Access Officer for NYSDOT for the accident history for the past three years from 2000 feet southwest of Hollow Road to 2000 feet northeast of High Road in the vicinity of the Pond Eddy Bridge (Appendix C-2). There were no accidents reported in the project area in the past three years.

#### 2.3.1.9. Existing Police, Fire Protection and Ambulance Access –

Adjacent emergency service providers respond from the Town of Lumberland, NY and the Township of Shohola, PA. Police Services are shared by local County and State Police Agencies.

Emergency responders have been involved in project coordination and public meeting forums. The existing bridge has a weight restriction of 7 tons which limits the access for emergency responders. Shared service fire responder trucks are 20 and 26 tons and thus restricted from crossing the Delaware River to get to Pond Eddy, Pennsylvania.

#### 2.3.1.10. Parking Regulations and Parking Related Conditions –

There are no areas regulated by parking restrictions within the project limits and there are no parking areas on the Pond Eddy Bridge.

#### 2.3.1.11. Lighting –

There is no street lighting on the Pond Eddy Bridge and no plans to install lighting on the structure as part of the project.

#### 2.3.1.12. Ownership and Maintenance Jurisdiction –

Per Article 2-A, The Interstate Bridge Commission, Sections 25, 26 and 27 of the Laws of New York the bridge is a shared responsibility controlled by the Pennsylvania-New York Interstate Bridge Commission. Under the Interstate Bridge Commission agreement, PennDOT District 4-0 has commissioned routine bridge inspections and implemented several recent substantive maintenance activities in 2007, 2010, and 2011. PennDOT will continue to serve as the responsible agent for maintaining the S.R. 1011 bridge crossing over the Delaware River.

### 2.3.2. Multimodal

#### 2.3.2.1. Pedestrians –

There are no separate provisions for pedestrians within the project limits. The bridge width can accommodate pedestrian traffic on the shoulders.

There are no approved plans for sidewalk extensions, trails, or other pedestrian routes beyond the bridge replacement. The bridge improvement project will continue to accommodate pedestrian movements with a sidewalk.

A Pedestrian Generator Checklist was prepared for the project and can be found in Appendix B-11 of this report.

#### 2.3.2.2. Bicyclists –

New York State Bicycle Route 17 follows State Route 97 in the project area. An inquiry was made to the Region 9 Bicycle and Pedestrian Coordinator regarding usage by bicycles of the designated bike route. Unfortunately NYSDOT does not keep usage records and no information was available. On the Pond Eddy Bridge, the occasional bicyclist may legally use the travel way or shoulder.

#### 2.3.2.3. Transit –

There are no transit providers operating within the project limits.

#### 2.3.2.4. Airports, Railroad Stations, and Ports –

There are no airports, railroad stations or port entrances within or in the vicinity of the project limits.

#### 2.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, State Lands) –

The Pond Eddy Bridge provides access from NY S.R. 97 across the Delaware River to Pennsylvania State Game Lands 209 and Pennsylvania’s Delaware State Forest.

### 2.3.3. Infrastructure

#### 2.3.3.1. Existing Highway Section –

The existing bridge is single lane, 14’10” wide curb to curb and 17’-3 ½” center to center of truss members. There are wooden curbs on the existing bridge to create a single center travel lane that is approximately 9 feet wide.

#### 2.3.3.2. Geometric Design Elements Not Meeting Standards –

##### 2.3.3.2. (1) Critical Design Elements –

In October 2006, PennDOT completed Safe Load Capacity and Load Rating Analyses on the bridge. The outcome of those analyses resulted in PennDOT reducing the bridge’s carrying capacity from eight to three tons due to the advanced state of structural deterioration. Repairs were made but, based on the advanced state of structural deterioration; the existing Pond Eddy Bridge has been classified as “structurally deficient.” The current posted weight limit equals 7 tons. The bridge is classified as functionally obsolete due to the height restriction of 13’ 6” and substandard single lane width of 14’ 10”. Subsequent inspections, load ratings, and extensive repairs have contributed to the maintenance of the 7 ton capacity.

##### 2.3.3.2. (2) Other Design Parameters –

There are no existing nonconforming features.

#### 2.3.3.3. Pavement and Shoulder –

The existing bridge supports a wood deck that is 14’-10” in width including travel (one-way) and shoulder areas. Wooden curbing is installed on the existing bridge to center traffic flow across the structure, which allows for pedestrian traffic to utilize the outer shoulder pathways for access.

#### 2.3.3.4. Drainage Systems –

There is no specialized drainage on the existing bridge. The Delaware River flows underneath and impacts the center pier with ice flows during the winter. A hydraulic analysis of the river flow and proposed bridge impacts are discussed in section 2.3.3.7.

#### 2.3.3.5. Geotechnical –

There are no known special geotechnical concerns with the soils or rock slopes within the project area.

#### 2.3.3.6. Structure –

##### 2.3.3.6. (1) Description:

(a) BIN – 5228710

(b) Feature carried and crossed – Pond Eddy Bridge carries PA 1011 over the Upper Delaware River

(c) Type of bridge, number and length of spans, etc. – Pennsylvania Petit Through Truss structure with 2 spans of 252± feet and one center pier.

(d) Width of travel lanes, parking lanes, and shoulders: Bridge width = 14’ 10”, travel width = 9’ 3”

(e) Sidewalks – Refer to Existing Bridge Typical Section

(f) Utilities carried – Verizon telephone on the bridge

##### 2.3.3.6. (2) Clearances (Horizontal/Vertical) –

Bridge width = 14’ 10”, travel width = 9’ 3”, and Height = 13’ 6”

##### 2.3.3.6. (3) History & Deficiencies –

The history of the bridge repairs is described below; however, it should be noted that the records are not detailed; therefore, specific details regarding each repair event are limited. Records indicate that repairs to the bridge were frequent, especially to the central pier, which was often damaged by the elements, including the flow of ice and debris every year. In 1908 the bridge was painted, planking was replaced, and the central pier was repaired. Subsequent repairs were conducted in one form or another in 1911, 1914, 1916, 1918, 1919, and 1923. In 1927, the Town of Lumberland sold the Pond Eddy Bridge to the New York-Pennsylvania Joint Interstate Bridge Commission for $3.00 because it needed extensive repairs.

Additional maintenance repairs were performed in 1969. In 1985, PennDOT, as lead agency, conducted its first official bridge inspection of the Pond Eddy Bridge. As a result of this detailed bridge inspection, the deck superstructure and substructure all received condition ratings of 5 and a weight restriction posting for 8-tons. Then in 1987 the superstructure was given a condition rating of 4, thus rendering the bridge to be considered as “structurally deficient.” In 1999, emergency funds were used to place three new beams between deteriorated stingers. There are no records of bridge repairs conducted between 1969 and 1999.

In 2006, the wooden deck was repaired. Later that year and as a result of another detailed bridge inspection, PennDOT lowered the posted bridge capacity from eight tons to three tons. In 2007, emergency funding was secured and 14 steel stringers were repaired at a cost of $70,000. Following these emergency repairs, the bridge was reposted to a seven-ton load limit. In 2010 substantial repair efforts were completed for the pier nose and footing underpinning at a cost of $250,000. In December 2010, the carrying capacity for the existing bridge was reduced to three-tons. Substantial repairs were completed in 2011 including the replacement of 64 steel stringers at a cost of $500,000. The 2011 stringer replacement efforts were intended to restore the existing structure to a seven-ton weight capacity. In 2013, additional stringers were replaced at a cost of approximately $150,000. From 2007 to 2013, $970,000 has been invested into the maintenance of the existing structure. Even with the substantial maintenance efforts, emergency response vehicles and most trucks (fuel, propane, and coal) still cannot legally use the bridge. Within the next five years, additional maintenance will be required to maintain the existing seven-ton weight capacity.

##### 2.3.3.6. (4) Inspection –

Bridge inspections will continue to monitor the capacity and condition of the existing structure. The sufficiency and condition ratings for the bridge include:

(a) Federal Sufficiency Rating – 20

(b) State Condition Rating – 3

(c) Summary of Condition and Inspection Reports and In-depth Inspection if done. Bridge Inspection reports are on file at PennDOT District 4-0.

##### 2.3.3.6. (5) Restrictions –

The existing bridge has a restricted load limit of 7 tons and a height restriction of 13’6”. There is a stop condition at each end of the bridge for intersecting highways or limited turns.

##### 2.3.3.6. (6) Future Conditions –

The Existing bridge will continue to limit access for emergency and basic services to Pond Eddy.

##### 2.3.3.6. (7) Waterway –

PennDOT and NYSDOT are proposing the replacement of the Pond Eddy Bridge. The existing bridge will remain in place during construction to maintain vehicular access to Pond Eddy, PA. The proposed replacement structure will be located approximately 22 feet upstream of the existing crossing. During the development of the hydraulic model the exact replacement structure was not known. In order to model the “worst case scenario” a four span – three pier structure has been modeled to adequately pass the 100-year flow event to demonstrate that any likely replacement structure would not adversely affect the flooding condition along the river and upstream properties. The other replacement options in consideration will have an even smaller affect on the flooding conditions along the river and upstream properties due to the fewer encroachments (piers) within the floodway.

A Coast Guard Checklist is not required. Federal and PA state waterway encroachment permits and NYSDEC authorization will be obtained as part of the final design activities for the project, including a Section 404 permit, NPS Section 7 Wild and Scenic River approval, PA DEP Chapter 105 permit and 401 Water Quality Certification, and Coordination with NY DEC for 401 Water Quality Certification, and NY State Pollutant Discharge Elimination System (SPDES) General Permit.

#### 2.3.3.7. Hydraulics of Bridges and Culverts –

PennDOT District 4-0 commissioned Newell, Tereska, and Mackay Engineering (NTM) to evaluate the hydrologic and hydraulic condition of the Upper Delaware River for the Pond Eddy Bridge Crossing and their December 10, 2008 report documents the results of their preliminary hydrologic and hydraulic information. The narrative of the NTM December 2008 report is as follows.

**INTRODUCTION**

This report presents preliminary hydrologic and hydraulic information for the Delaware River at the SR 1011 crossing in Shohola Township, Pike County, Pennsylvania. The crossing continues into Lumberland Township, Sullivan County, New York. The existing two-span, pin-connected, Pennsylvania (Petit) through truss bridge is being considered for replacement due to structural deficiencies. The existing bridge is set on stone and concrete abutments with a pier midspan. This study was conducted to quantify the hydraulic impacts of a hydraulically “worst case scenario” replacement. This “worst case scenario,” modeled as the *Hatch Mott Alternative* is consistent with the four-span continuous prestressed concrete girder bridge proposed by Hatch Mott MacDonald in 2002. The structural feasibility of the design was confirmed by Erdman Anthony and Associates. Two additional scenarios were modeled to evaluate the impact of changes to the design. The second scenario entitled *Revised Hatch Mott Alternative* evaluates raising the profile to eliminate the updated 100-year flow impacting the low chord. The third scenario, entitled *Relocated Structure Alternative* considers locating a raised profile replacement structure closer to the existing bridge than the original *Hatch Mott Alternative*. These alternatives are described below.

**HYDROLOGIC ANALYSIS**

The drainage basin for the Delaware River watershed at the SR 1011 crossing is 2,820 mi2. This encompasses much of the portion designated the Upper Delaware River. FEMA peak discharges for the Delaware River were taken from a study performed by the U.S. Army Corps of Engineers (USACE) in 1984. The USACE study, entitled Delaware River Basin Study, included a mixed population analysis in which hurricane and non-hurricane floods were analyzed separately and combined. The HEC-1 program was then used to remove the influence of upstream reservoirs on the record. The U.S. Geological Survey (USGS) conducted a flood magnitude and frequency study in 2007, released as Open-File Report 2008-1203. The report compared an updated study using the methodology outlined in the 1984 Delaware River Basin Study to a gage analysis of the entire record performed using guidelines published by the Interagency Advisory Committee on Water Data in its Bulletin 17B. Despite the upstream regulation within the flood record, the methods returned similar results, largely within five percent. According to the USGS Report, the Delaware River Coordinating Committee, which included representatives of the USGS and FEMA, agreed to adopt the USGS flows for ongoing FEMA flood insurance studies.

For the current study, a Log Pearson Type III gage analysis was performed per Bulletin 17B on an upstream gage near Barryville, NY with a drainage area of 2,020 mi2 and a downstream gage at Port Jervis, NY with a drainage area of 3,070 mi2. These flows were transposed to the project site per DM-2 Chapter 10. A weighted average (gage drainage area in relation to project drainage area) of the transposed flows was used for this study.

Table 1 shows a comparison between the peak discharges presented in the FEMA study and those developed in the current study. The current study flows are greater than those in the FIS primarily due to the additional flood record, which included several recent floods, three of which are among the top five on record at both gaging stations.

Table 1: Estimated Peak Flows for Delaware River

Peak Discharge (cfs)



**HYDRAULIC ANALYSIS**

The hydraulic analysis was performed using the U.S. Army Corps of Engineers’ HEC-RAS River Analysis System program (Version 4.0). Since the project site is in a FEMA detailed study area and encroaches on a floodway, the hydraulic modeling was set up to meet the FEMA modeling requirements for a Conditional Letter of Map Revision (CLOMR).

**Duplicate Effective Model**

The Effective FEMA Model consists of the original HEC-2 electronic data. This geometry was electronically imported to HEC-RAS to create the Duplicate Effective Model. Changes to this model were limited to adjusting the distance from the existing structure face to the bounding cross sections from 0’ to 1’ to allow the HEC-RAS model to run. The water surface profile from this Duplicate Effective Model is consistent with the published FEMA profiles from the Effective FEMA Model. The water surface profile from this Duplicate Effective Model differs from the Effective FEMA model by a maximum of 0.29’, well within the 6” tolerance acceptable to FEMA.

**Corrected Effective/Existing Conditions Model**

Updated geometric data was added and minor corrections were made to the Duplicate Effective Model to develop the Corrected Effective Model. As no significant man-made changes have occurred since the development of the Effective FEMA Model, this model also represents the Existing Conditions Model. The FEMA model and water surface profiles were presented in NGVD 29. As this study was conducted in NAVD 88, the model datum was adjusted by -0.568 to convert the FEMA geometry to NAVD 88. All elevations within this report are presented in NAVD 88 unless specifically noted. Surveyed hydraulic cross sections and bridge characteristics were added to the model to better represent the River up and downstream of the SR 1011 crossing. Two survey sources were used within the model geometry: a 2002 survey by Hatch Mott MacDonald and an October 2008 survey by Erdman Anthony. The more recent Erdman Anthony survey was used to validate the existing Hatch Mott survey and provide additional geometry in the vicinity of the FEMA named cross sections. FEMA cross sections were replaced with the updated surveyed cross sections where available. The bridge characteristics were changed to reflect the field visit by NTM Engineering and the survey completed by Erdman Anthony, both conducted in October 2008. The updated survey data and bridge characteristics yield an existing structure with a hydraulic opening of 15,616 square feet, slightly larger than the 14,986 square feet reflected in the FEMA Effective model. Minor adjustments were made to the overbank Manning’s “n” values and the contraction/expansion coefficients based on a site survey in October 2008. The FEMA steady flow data was edited to incorporate the updated peak discharges developed in this study. The downstream boundary location was maintained, but a normal depth boundary condition was used to model the updated flows.

**Proposed (Post-Project) Model**

Three scenarios were modeled as part of this study; each model is individually summarized below:

***Hatch Mott Alternative***

This model evaluates the original Hatch Mott MacDonald design, which represents the “worst case scenario.” The bridge characteristics are summarized below:

Clear span: 508.8’ (abutment to abutment)

Out-to-out width: 24.5’

Beam Depth: 63” with and 8.5” deck

Piers: 3 round nose piers (4’ width)

Low Chord: 531.02’

Location: 65.61’ upstream of the existing structure (centerline to centerline)

***Revised Hatch Mott Alternative***

This model considers raising the profile of the *Hatch Mott Alternative* by 1.8’ to eliminate impacts to the low chord. This structure shares the *Hatch Mott Alternative* structure characteristics, except the low chord, which is raised to 532.8’.

***Relocated Structure Alternative***

This scenario evaluates relocating the proposed structure with raised profile closer to the existing structure. In this scenario, the proposed structure is located 43’ upstream of the existing structure (centerline to centerline). This structure shares the *Hatch Mott Alternative* bridge characteristics, except the location and low chord. The low chord in this structure is raised 0.6’ to 531.6’ to eliminate impacts from the 100-year event.

**RESULTS**

The hydraulic impacts of the three scenarios were evaluated using the updated 100-year flow. Figures and supporting details for the Hydraulic analysis are provided in the full report included in Appendix B-9. Water Surface profiles are documented in the preliminary hydrologic and hydraulic information prepared by NTM Engineering December 2008. Detailed results by hydraulic cross section are presented for each model in Tables 3-5 at the end of the report (Appendix B-9 – H&H report). The *Hatch Mott Alternative* results in pressure flow, causing backwater increases of up to 7.3’ propagating almost 8000’ upstream. The raised profile of the *Revised Hatch Mott Alternative* causes considerably smaller increases of up to 1.3’, propagating a similar distance upstream. The *Relocated Structure Alternative* results in decreases to existing backwater on the order of 0.2’. These results are summarized in Table 2.

Table 2: Summary of Hydraulic Impact – Current 100-year Flow

Scenario Backwater Impacts

|  |  |
| --- | --- |
| Scenario | Backwater Impacts |
| Hatch Mott Alternative | Increases up to 7.3’ at the structure |
| Revised Hatch Mott Alternative | Increases up to 1.3’ at the structure |
| Relocated Structure Alternative | Decreases up to 0.2’ at the structure\* |
| \*note 0.01’ increase at 2 cross section 6500’ upstream of the structure | |

While this analysis considered a limited number of alternatives, general conclusions can be drawn from the results. The replacement structure must maintain a high enough profile to eliminate pressure flow to be hydraulically feasible. The minor backwater from the existing structure quickly ties into the existing water surface profile. If the replacement structure is too far upstream of the existing structure, increased backwater is unavoidable. A structure with improved hydraulic capacity placed within the immediate backwater of the existing structure can eliminate upstream impacts. The bottom chord elevation for the proposed 2-span truss is approximately 532.35’ which is 3.75 feet above the 100-year flood elevation of 528.60’. This chord elevation will avoid backwater impacts from the new structure.

#### 2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators –

The existing truss on the Pond Eddy Bridge serves as the protective barrier for the travel lane over the Delaware River. There are existing guide rails along S.R. 1011 Flagstone Road, Rosa Road, and S.R. 97 in the immediate vicinity of the Pond Eddy Bridge crossing.

#### 2.3.3.9. Utilities –

Verizon telephone service is provided to Pond Eddy – Shohola Township customers via an existing line on the Pond Eddy bridge structure. Telephone service to Westfall Township Pond Eddy customers is supplied by an aerial cable crossing over the Delaware River approximately 1 mile± downstream. PP&L supplies electrical power to Pond Eddy, PA via transmission lines on poles within the State Game Land and overland from Parkers Glen in Shohola. Additional coordination with the local utility companies will occur through the final design and permitting phase of the project.

| Exhibit - 2.3.3.9 Existing Utilities | | | | |
| --- | --- | --- | --- | --- |
| Owner | Type | Location/Side | Length | Condition/Conflict |
| Verizon | Telephone | On Pond Eddy Bridge | 500 feet | Line on bridge provides telephone service to Pond Eddy, Shohola Township community. Telephone service to Westfall Township Pond Eddy customers is supplied by an aerial cable crossing over the Delaware River approximately 1 mile+- downstream. |
| PP&L | Electric | Overland in PA |  | PP&L supplies electrical power to Pond Eddy, PA via transmission lines on poles within the State Game Land and overland from Parkers Glen in Shohola. |

#### 2.3.3.10. Railroad Facilities –

There are no railroads within the project limits and no at-grade crossings within the immediate area that could impact traffic conditions. There is an active freight line that runs parallel to the Delaware River along the Pennsylvania side of the river in the project area. The freight line crosses the Delaware River into New York State further downstream.

### 2.3.4. Landscape and Environmental Enhancement Opportunities –

This section focuses on the critical existing areas to identify potential enhancement opportunities related to the project and to help avoid and minimize impacts. Chapter 4 focuses on the impacts, enhancements, and mitigation.

2.3.4.1. Landscape –

The landscape of the surrounding area consists of sloping terrain with limited land use density. The project site is a bridge crossing over the Upper Delaware River. The periphery is considered mountainous and is associated with the Delaware River valley corridor.

##### 2.3.4.1. (1) Terrain –

According to properties described in the NYS Department of Transportation Highway Design Manual, the terrain of the project improvement area is level. Highway sight distances, as governed by both horizontal and vertical restrictions, are generally long or could be made to be so without construction difficulty or major expenses.

##### 2.3.4.1. (2) Unusual Weather Conditions –

There are no unusual weather conditions within the project area. The climate is typical of the region and consists of warm to hot summers and cold winters with moderate to heavy snowfall.

##### 2.3.4.1. (3) Visual Resources –

The visual environment consists of the Historic Pond Eddy Bridge crossing the Scenic and Recreational Upper Delaware River with the surrounding wooded mountains along the valley river corridor.

#### 2.3.4.2. Opportunities for Environmental Improvements –

The Upper Delaware River is a Scenic and Recreational resource and is surrounded by primarily wooded mountainous valley corridor. Potential opportunities for environmental enhancements could include a regional boat launch, fishing access, or a scenic overlook.

### 2.3.5. Miscellaneous –

There are no other miscellaneous items

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# – ALTERNATIVES

This chapter discusses the alternatives considered and examines the engineering aspects for all feasible alternatives to address project objectives in Chapter 1 of this report. In an effort to address the purpose and need of the project, an analysis of alternatives was developed for the project using the design criteria in Section 3.2.3.2 of this report. Understanding the sensitive nature of the different Section 4(f)-protected resources within the project area, several alternatives were evaluated as part of the Alternatives Analysis for the project. The alternatives identified for consideration were developed not only as part of the engineering feasibility studies but also the Section 106 consulting party and public meeting forums.

## 3.1. Alternatives Considered and Eliminated from Further Study

The following table is provided to summarize each alternative for the project. The detailed evaluation of alternatives/alternatives analysis is documented in the approved Individual Section 4(f) Evaluation for the project (Appendix B-1). The following alternatives narrative and supporting tables summarize the estimated costs and results of the alternatives analysis that were developed and approved by the DOT’s and FHWA as part of the project development process. Details regarding the evaluation of alternatives are documented in the approved Individual Section 4(f) Evaluation (Jan 2012). The table outlines the estimated costs and summarizes each alternative with respect to meeting the project purpose and need, project objectives, construction access, life expectancy, and project impacts, including 4(f) resources (historic bridge, SGL, State Forest, and Delaware River).

| Project  Alternative | Cost 1 | Remarks |
| --- | --- | --- |
| Alternatives Considered and Dismissed from Detailed Alternatives Analysis | | |
| Pond Eddy Buyout | $9.4 million | As part of the public outreach efforts for the project, PennDOT has received feedback from the local officials and residents of Pond Eddy that they oppose the Pond Eddy Buyout Alternative. The local residents and public officials signed a petition and submitted it to PennDOT in May 1999 documenting their opposition to the Buyout Alternative. The Buyout Alternative may be feasible, but given the impacts to the local community, this alternative does not appear to be a practical or prudent project alternative; therefore, this alternative was dismissed from further consideration. PennDOT is required under Act 120 to provide access to the Commonwealth. |
| SGL Alternate Access | $43.7 million | State Game Lands Alternate (SGL) Alternate Access would require use of the State Game Lands 209 and involve construction of 4.8 miles of new roadway with impacts to the surrounding environment and require substantial costs. Given the inability to meet the project purpose and need, impacts to the SGLs and other natural resources, community impacts due to changes in the existing travel patterns, and substantial required costs, the State Game Lands Alternate Access Alternative was dismissed from further consideration. |
| Mill Rift Alternate Access | $41 million | The Mill Rift Alternate Access would require use of the Delaware State Forest and involve construction of 4.5 miles of new roadway with impacts to the surrounding environment and require substantial costs. Given the inability to meet the project purpose and need, impacts to the state forest and other natural resources, community impacts due to changes in the existing travel patterns, and substantial required costs, the Mill Rift Alternate Access Alternative was dismissed from further consideration. |
| Parkers Glen  Alternate Access | $45 million | The Parker’s Glen Alternate Access would require use of existing local roadway and lands adjacent to the existing Norfolk Southern Railroad. This alternative would involve construction of 5 miles of new roadway with impacts to the surrounding environment and substantial required costs. Given the inability to meet the project purpose and need, impact to the surrounding environment, community impacts due to changes in the existing travel patterns, and substantial required costs, the Parkers Glen Alternate Access Alternative was dismissed from further consideration. |
| Dual Bridge | $8.8 million2 | This alternative violates the NPS’s 10-bridge limit management policy for the implementation of Section 7 of the National Wild and Scenic Rivers Act for the Upper Delaware Scenic and Recreational River, negatively impacts recreational boating, increases backwater flooding, and involves finding a new owner to maintain the existing bridge in place. The Dual Bridge option does not appear to be a feasible or prudent alternative given the impacts to the Delaware River and opposition by the NPS. |

1: 2009-2010 cost estimates

2: Dual Bridge cost estimate included the cost of the 4-span three pier bridge replacement structure with construction access, right of way, and associated costs. The Dual Bridge alternative does not include the cost for the disassembly of the existing Pond Bridge for reuse.

## 3.2. Feasible Build Alternatives

### 3.2.1. Description of Feasible Alternatives

Project alternatives and sub alternatives were developed to meet the project purpose and need using the design criteria in Section 3.2.3.2 of this report. Additionally, the no-build alternative was included in the evaluation of alternatives. The following alternatives and sub alternatives were evaluated as part of the project development process:

Alternatives Considered in Detail

1. Total Section 4(f) Avoidance Alternatives

i. No Build

ii. Rehabilitation

2. Other Alternatives Considered in Detail

i. Bridge Replacement

ii. Rehabilitation with Strengthening and/or Widening

a. Rehabilitate and Strengthen Bridge to HS-20 Capacity

b. HS-20 Loading with Deck Widening

#### 1. Total Section 4(f) Resource Avoidance

##### i. No Build

The No Build (or Do-Nothing) Alternative involves taking no action (other than routine maintenance activities) and allowing the existing Pond Eddy Bridge to remain in place as is. No rehabilitative or any other significant structural improvements would be completed under this alternative. The nature of the deterioration of this structure is such that maintenance efforts cannot address it successfully. The dependability of the structure would become questionable, and safety for motorists and pedestrians would be compromised. The bridge would eventually have to be closed because it would not be able to carry any loads safely. Closure of the bridge would result in a complete loss of the crossing of the Delaware River at this location; which would force the residents of Pond Eddy, Pennsylvania, to abandon their homes and property, would limit public access to the State Game Land No. 209, the Delaware State Forest, and the active Norfolk Southern rail line. Closure and continued deterioration would also likely result in its removal altogether, which constitutes a use of the bridge as a Section 4(f) resource.

The No Build Alternative does not meet the project purpose and need; therefore, this alternative does not appear to be prudent or feasible.

##### ii. Rehabilitation

The Bridge Rehabilitation Alternative considers rehabilitating the existing Pond Eddy Bridge to its original capacity to carry S.R. 1011 over the Delaware River. To adequately assess the condition of the bridge and evaluate the rehabilitation options, PennDOT commissioned the following engineering evaluations (Appendix E-2).

Hatch Mott MacDonald (HMM) Engineering Feasibility Study (February 2003) with the incorporation of the in-depth bridge inspection reports prepared by McFarland-Johnson Engineers, Inc. and HNTB Corporation

PennDOT Bridge Quality Assurance Division - Hal Rodgers Report (November 2006)

Michael Baker, Jr., Inc. - Second Opinion Report (March 2009)

The evaluations document the structural condition of various components of the existing bridge in order to determine the necessary work efforts that would be required as part of the Bridge Rehabilitation Alternative. Hatch Mott MacDonald made the initial evaluation and PennDOT provided their follow-up concurrence. As part of the public outreach for the project, a second opinion was requested by some of the consulting party groups. Michael Baker, Jr. Inc. completed their assessment and concurrence on the bridge rehabilitation. The evaluation of a Bridge Rehabilitation Alternative is described below.

###### Rehabilitation Option 1 (Restore Bridge to Original As-Built Condition)

This option evaluated rehabilitative efforts to restore the existing bridge to its original as-built condition and thus would require repair or replacement of individual bridge components including stringers, floor beams, and truss members. To repair the bridge to get it back to the original condition, the following repairs would be required.

1. Replacement of the deck with a new timber deck

2. Replacement of many of the stringers and floor beams

3. Repairs to the truss members

4. Extensive reconstruction of the substructure

5. Replacement of several deteriorated pins

Implementation of these efforts would allow for a maximum bridge capacity of 15 to 18 tons with a life expectancy of 10 to 20 years before another major bridge rehabilitation would be necessary. The rehabilitated structure will remain a single-lane bridge with a 14'10" curb-to-curb width. A temporary support system would need to be erected to conduct the necessary rehabilitation efforts, specifically for the replacement of deteriorated pins. A temporary bridge would need to be constructed to maintain access across the Delaware River for Pond Eddy, Pennsylvania. Construction of the temporary support system and the temporary river crossing bridge would require additional access into and impacts to the Delaware River. The temporary support system would be required through one to two construction seasons. The implementation of these short-lived rehabilitative efforts would be costly and require substantial access within the Delaware River. It should be noted that extensive stringer repairs have been commissioned from 2007 – 2013 to maintain the use of the bridge at the 7-ton posted limit.

The rehabilitation of the deck, stringers, floor beams, and truss members alone would not increase the load-carrying capacity of the bridge, as the pins are the bridge components that control the load rating.

###### Summary of Rehabilitation Option 1-ii.

Due to the advanced deterioration of the bridge, the rehabilitation would require substantial costs associated with a temporary support system, river access, and a temporary access bridge. Replacement of the pins would be difficult and costly. The rehabilitation would require the installation of causeways in the river so that a temporary support system could be erected to complete the bridge repairs. Additionally, because the existing bridge would require significant repair, traffic could not be maintained on the existing bridge during construction. Therefore, a temporary bridge would need to be constructed to maintain access to Pond Eddy, Pennsylvania. PennDOT and Erdman Anthony (PennDOT’s bridge engineer) have determined that the cost to complete the rehabilitation of the existing bridge, Option 1, is estimated at $15.3 million and would require substantial access within the Delaware River. The life expectancy for the rehabilitation options would be 10 to 20 years and involve annual maintenance costs estimated at $18,000. Pursuance of the rehabilitation (Option 1) would involve a substantial investment for a limited life expectancy. In New York State, the standard life expectancy for bridges is 75 years.

Implementation of Option 1 of the rehabilitation alternatives would result in a bridge structure with a posted weight limit between 15 and 18 tons and a limited life expectancy of 10 to 20 years. There are design exceptions under PennDOT’s Design Manual Standards or with the Smart Transportation Policy to allow lower load ratings (HS15) for bridge crossings in certain applicable circumstances. In the case of a sole crossing across the Delaware River, this would not be an applicable site. Local residents have stated their need to have effective and safe crossing over the Delaware River for not only their personal transportation but also for basic and emergency services, as documented under the Purpose and Need Section. Therefore, Option 1 only partially satisfies the project’s purpose and need and would not adequately provide a structurally sound bridge to carry S.R. 1011 over the Delaware River.

Rehabilitation of the bridge is feasible; however, due to the engineering complexity leading to excessive cost, substantial access within the Delaware River, limited life expectancy, and its ability to only partially meet the project purpose and need for the project, Rehabilitation Option 1 is not considered a prudent alternative.

#### 2. Other Alternatives Considered in Detail

##### 2-i. Bridge Replacement Alternatives

The Bridge Replacement Alternative would involve the construction of a new bridge structure immediately upstream of the existing Pond Eddy Bridge. Hatch Mott MacDonald (HMM) considered bridge replacement options as part of their 2003 Engineering Feasibility Study. The HMM study specifically identified four bridge design options for consideration for the Bridge Replacement Alternative.

Three-span continuous steel multi girder bridge (Option A-1)

Four-span prestressed concrete I-beam bridge (Option A-2)

Two-span simply supported steel through truss bridge (Option A-3)

Two-span continuous welded steel plate girder bridge (Option A-4)

The two-span continuous welded steel plate girder bridge (Option A-4) was initially determined by Hatch Mott MacDonald to pose potential backwater and flooding concerns associated with required beam depths. Cost estimates were developed for comparison of the replacement options.

COST SUMMARY FOR BRIDGE REPLACEMENT OPTIONS

TO BE CONSIDERED IN FURTHER DETAIL

|  |  |
| --- | --- |
| Bridge Replacement Options 1 | Estimated  Construction Cost 2,3 |
| Three-span continuous steel multi-girder bridge (A-1) | $9,400,000 |
| Four-span prestressed concrete I-beam bridge (A-2) | $9,600,000 |
| Two-span simply supported steel through truss bridge (A-3) | $10,360,000 |
| 1: Costs represent only structure costs with estimated lifespan is approximately 75 years  2: Costs are referenced from the 2010 Erdman Anthony Cost updates and include an estimated amount of $825,000 for disassembly of the existing Pond Eddy Bridge  3: Annual maintenance costs are estimated at $10,000 for the replacement options | |

As part of the Section 106 coordination process, consulting party members questioned whether a replacement alternative would create backwater flooding concerns for upstream properties. To address these concerns, PennDOT commissioned NTM Engineering to complete a hydraulic and hydrologic study to evaluate the backwater flooding potential for the replacement alternative. The four-span pre-stressed concrete I-beam bridge (Option A-2) was evaluated in these analyses because the four-span three-pier design was considered to represent the “worst-case scenario” from a potential flooding encroachment perspective. The results of the NTM study determined that the proposed replacement alternative would not create a backwater flooding problem for the upstream properties. The replacement alternative would adequately pass the 100-year flow through the crossing location without impacts to the surrounding environment.

Advancement of the replacement alternative would involve the construction of a new bridge structure immediately upstream of the existing Pond Eddy Bridge (with use of a temporary causeway), so that the existing bridge can be used to maintain traffic during project construction. Following project construction, the existing Pond Eddy Bridge would be demolished or removed for reuse at another location, if another owner is identified.

###### Summary of the Replacement Option

This alternative would result in an obvious use of the National Register-listed Pond Eddy Bridge and the Upper Delaware Scenic and Recreational River/Pennsylvania Water Trail on both a temporary and permanent basis. The permanent impacts to these resources are the removal of the historic bridge and construction of the new bridge with the placement of piers at potentially new locations in the water trail. The replacement option includes a balanced consideration of impacts (minimizing flooding and direct encroachment within the Delaware River) with economic costs while meeting the purpose and need of the project. Various replacement structure configurations have been hydraulically modeled and shown to avoid backwater flooding impacts. Advancement of this alternative would involve further consideration of avoidance and minimization measures for the Delaware River and coordination with the NPS, PFBC, and permitting agencies through the Final Design and Permitting phase of the project. The replacement alternative would be designed to meet current PennDOT design criteria for safety and load carrying capacity. This alternative meets the project purpose and need by providing a structurally sound bridge to carry S.R. 1011 over the Delaware River. As such, this alternative qualifies as a feasible and prudent project alternative.

##### 2-ii. Rehabilitation with Strengthening and/or Widening

###### Rehabilitation Option 2ii-a. (Rehabilitate and Strengthen Bridge to HS-20 Capacity)

This option considered rehabilitative efforts to strengthen the existing structure to meet the HS-20 (36 Ton) vehicle load capacity. The HMM study of the existing bridge determined that the deck, stringers, floor beams, 45% of the truss members, and several of the truss pins did not satisfy the HS-20 vehicle rating criteria. The HMM study evaluated the components of the existing bridge, in their original non-deteriorated condition, and characterized them to have the following inventory and operating rating capacities. In accordance with the AASHTO Manual for Condition Evaluation of Bridges, inventory rating refers to the load that can safely utilize the bridge for an indefinite period of time. Operating load is the maximum permissible live load that can be placed on the bridge. Unlimited usage at the operating rating level will reduce the life of the bridge.

The existing interior stringers supporting the 4"x8" timber deck were rated for flexure and shear resulting in an inventory rating of 17 tons and operating rating of 24 tons.

The existing floor beams were checked for flexure and shear resulting in an inventory rating of 13 tons and operating rating of 20 tons.

The existing hanger plates are deteriorated (as determined by McFarland-Johnson Engineers inspection) and thus checked for tension, shear, block shear, and bearing resulting in an inventory rating of 37 tons and an operating rating of 42 tons.

The rating of the pins was evaluated as part of the HNTB inspection (January 1970) and the pins were checked for shear, bearing, and bending, resulting in several pins failing in bending. The controlling pins were determined to be U1 and U7 with an inventory rating of 11 tons and an operating rating of 18 tons. See plans in Appendix E-2.

Based on the strength of existing members and the condition of the structure, the following repairs and rehabilitation were recommended in the HMM study in order to increase the load carrying capacity of the bridge for HS-20 loading.

The existing timber deck would be replaced with an open steel grid deck.

The existing stringers would be replaced with 4 steel stringers, W18x50, M270 Grade 36. The new stringers would be coped at the ends at the top flange to avoid interference with the existing floor beams. The stringers would be bolted to the web of the existing floor beams using connection angles and high strength bolts.

The existing floor beams would be strengthened by adding 2½" steel plates, M270 Grade 36, to the top and bottom flanges. Significantly deteriorated floor beams would be replaced with new beams sized to accommodate intended higher load rating capacity.

The existing top chord members would be strengthened by using a 5/16"x16" plate at the bottom face of the member. The existing lacing bars would be removed in stages as the new plate is being installed. The existing truss diagonals, verticals, and bottom chord tension members would be strengthened with cables or adjustable bars that are connected to the truss pins and placed directly over the existing members.

A minimum of eight pins of the upper truss chord do not meet the loading criteria and would need to be replaced. This type of truss bridge requires all members to be connected by a single pin at each of the panel points. Removing the truss pins would require disconnecting and temporarily supporting all the truss members framing into that panel, including the span itself.

New steel members would be installed to replace existing members that are severely deteriorated,. As with the replacement of truss pins, truss member replacement would require temporary support of the bridge while existing truss members are removed and new members installed. In addition to strengthening of the bridge superstructure, the existing piers and abutments require masonry repairs.

The foundation of the existing pier, located in the center of the river, should also be underpinned to alleviate ongoing scour issues.

Implementation of these efforts would allow for a maximum weight bridge posting at 36 tons with a life expectancy of 10 to 20 years before major bridge rehabilitation would be necessary.

In order to increase the load capacity, as well as to repair significant areas of deterioration, numerous bridge components, including the deck, floor beams, stringers, and various truss members, would have to be replaced or significantly modified. The extent of the repairs could include using beams and members that are larger in size, replacing lacing bars on the upper chords with steel plates, adding cables adjacent to designated truss members to increase the load-carrying capacity, and replacing pins. The utilization of bigger beams and member strengthening with cables along with the appropriate pin replacement will accommodate the desired increased load capacity.

The changes, however, would compromise character-defining features of the truss and impact the bridge’s materials, workmanship, feeling, and association. Changes to the bridge fabric to allow for a maximum weight bridge posting at 36 tons would affect its historic integrity. In particular, replacing existing beams and members with larger ones will alter the fabric. The addition of cables and adjustable bars would not only alter the fabric but would also add visual components inconsistent with the original design and construction. Changes to the substructure such as the steel open grid deck, replaced stringers, and strengthened floor beams may not be visible alterations; however, the addition of larger beams and members and the addition of cables and adjustable bars would be. The additive nature of the necessary changes would alter the characteristics of the Pond Eddy Bridge that made it eligible for inclusion in the National Register. This level of bridge strengthening would diminish the historic integrity of the original bridge design.

The rehabilitated structure will remain a single-lane bridge with a 14'10" width. Additionally, traffic could not be maintained on the existing bridge during construction. A temporary bridge would need to be constructed to maintain access across the Delaware River for Pond Eddy, Pennsylvania. Construction of the temporary support system and the temporary river crossing bridge would require additional access and impacts to the Delaware River. The implementation of these rehabilitative efforts would be costly, require substantial access within the Delaware River, and diminish the historic integrity of the original bridge design.

###### Rehabilitation Option 2-ii-b (HS-20 Loading with Deck Widening)

This option considered rehabilitating the structure to meet the HS-20 (36-ton) load capacity along with widening the existing structure to maintain two lanes of traffic. To do so, the existing structure would need to be dismantled to rehabilitate the truss members and the entire floor system (deck, stringers, and floor beams) would need to be replaced. A new lateral bracing system for the truss would also have to be constructed to accommodate the wider structure. This option would also require the in-stream pier and abutments to be widened to accommodate a two-lane bridge crossing.

In order to increase the load capacity as well as to repair significant areas of deterioration, numerous bridge components, including the deck, floor beams, stringers, and various truss members, would have to be replaced or significantly modified. The extent of the repairs could include using beams and members that are larger in size, replacing lacing bars on the upper chords with steel plates, adding cables adjacent to designated truss members to increase the load-carrying capacity, and replacing pins. The utilization of bigger beams and member strengthening with cables along with the appropriate pin replacement will accommodate the desired increased load capacity. The changes, however, would compromise character-defining features of the truss and impact the bridge’s materials, workmanship, feeling, and association. Changes to the bridge fabric to allow for a maximum weight bridge posting at 36 tons would affect its historic integrity. In particular, replacing existing beams and members with larger ones will alter the fabric. The addition of cables and adjustable bars would not only alter the fabric but would also add visual components inconsistent with the original design and construction. Changes to the substructure such as the steel open grid deck, replaced stringers, and strengthened floor beams may not be the visual alterations; however, the addition of larger beams and members and the addition of cables and adjustable bars would be. The additive nature of the necessary changes would alter the characteristics of the Pond Eddy Bridge that made it eligible for inclusion in the National Register. The bridge strengthening and widening efforts would diminish the historic integrity of the original bridge design.

Construction of the temporary support system and the temporary river access would also require additional access and impacts to the Delaware River. The implementation of these rehabilitative efforts would be costly, require substantial access within the Delaware River, and diminish the historic integrity of the original bridge design.

###### Summary of the Rehabilitation Options 2ii-a and 2ii-b.

Due to the advanced deterioration of the bridge, rehabilitation would require substantial costs associated with a temporary support system, river access, and a temporary access bridge. Replacement of the pins and/or widening the structure would be difficult and costly. The rehabilitation would require the installation of causeways in the river so that a temporary support system could be erected to complete the bridge repairs. A temporary bridge would need to be constructed to maintain access to Pond Eddy, Pennsylvania. PennDOT and Erdman Anthony (PennDOT’s bridge engineer) have determined that the minimum rehabilitation costs for Option 2ii-a (with strengthening) and Option 2ii-b (strengthening with widening) are estimated at $16.3 million and $18.5 million, respectively. Depending on the extent of deterioration and strengthening needs, additional costs may be required for these options. Life expectancy would be approximately 10 to 20 years. Pursuance of these rehabilitation options would involve a substantial investment for a limited life expectancy.

There are design exceptions under PennDOT’s Design Manual Standards or with the Smart Transportation Policy to allow lower load ratings (HS15) for bridge crossings in certain applicable circumstances. In the case of a sole crossing across the Delaware River, this would not be an applicable site. Therefore, consideration of rehabilitation with strengthening to a lower load rating is not considered to be prudent based on the access needs for the community of Pond Eddy, Pennsylvania. Rehabilitation of the bridge with strengthening and/or widening may be feasible; however, due to the engineering complexity leading to excessive cost, substantial access within the Delaware River, limited life expectancy, and impacts to the bridge’s historic integrity, Rehabilitation - Options 2ii-a and 2ii-b are not considered prudent alternatives.

### 3.2.2. Preferred Alternative

The Bridge Replacement Alternative has been identified as the preferred feasible and prudent alternative considered that meets the project purpose and need. This alternative proposes the construction of a new bridge structure immediately upstream of the existing Pond Eddy Bridge, such that the existing bridge can be used to maintain traffic during project construction.

### 3.2.3. Design Criteria for Feasible Alternative(s)

#### 3.2.3.1. Design Standards –

PennDOT, in coordination with NYSDOT, commissioned the formation of a Design Advisory Committee (DAC) to solicit local input on the bridge type and aesthetic appearance of the replacement structure. The DAC identified two bridges types for the DOT’s consideration including a 2 span truss and a 3-span steel girder bridge. The DOT’s have determined that the 2 span truss would be advanced into final design. In final design, the DOT’s will further consider structure configuration, aesthetic features, engineering elements, and constructability of the structure, with the goals of providing a context sensitive design and that also meets PennDOT Smart Transportation and Design guidance, including but not limited to: PennDOT Design Manual Part 2: Highway Design (Publication 13M), as supplemented by the American Association of Highway and Transportation Officials (AASHTO) Green Book (2001); PennDOT Design Manual Part 4: Structures (Publication 15M); FHWA Flexibility in Highway Design; and, PennDOT Strike-off Letter 432-08-03.  FHWA, PennDOT, and NYSDOT will provide necessary engineering and design support to assist the DAC in its task.

#### 3.2.3.2. Critical Design Elements –

The following table identifies critical design elements applicable to the proposed bridge replacement project.

| Exhibit 3.2.3.2.  Critical Design Elements for Route 1011 | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PIN: | | | 9803.89 | | NHS (Y/N): | No | |
| Route No. & Name: | | | S.R. 1011  All Veterans Memorial Bridge/Pond Eddy Bridge | | Functional Classification: | Low Volume Local-Rural | |
| Project Type: | | | Bridge Replacement | | Design Classification: | Residential Access “C” | |
| % Trucks: | | | 0 (Load posted for 7T) | | Terrain: | Level | |
| AADT: | | | 68 | | Truck Access/Qualifying Hwy. | No | |
| Element | | | | Standard | | Existing Condition | Proposed Condition |
| 1 | Design Speed1 | | 25 to 43 mph - HDM §4.2 (Table 4-2) | | 10 mph posted | 25 mph  (10 mph posted) | |
| 2 | Lane Width | | 10 feet - HDM §4.2 (Table 4-4) | | 1 lane = 14’-10” feet curb to curb | 1 lane = 15’-8” | |
| 3 | Shoulder Width  (Each side) | | HDM §4.2 (Table 4-4)  2 feet min  BDM Appendix 2A (Table R)  Bridges >100’; 3’ | | 0’ | 2’-10” each side  5’-8” Total | |
| 4 | Bridge Roadway Width | | 16 feet min  (Traveled Way plus 3’ each side)) | | 14’-10” curb to curb | 15’-8” | |
| 5 | Maximum Grade | | 8% to 7% - HDM §4.5 (Table 4-5) | | 2.0% | 2.0% | |
| 6 | Horizontal Curvature | | 98 ft radius to 180 ft radius  HDM §4.5 (Table 4-5) | | Tangent | Tangent | |
| 7 | Superelevation Rate | | Max 0.06 ft/ft - HDM §4.5 (Note G.) | | None | None | |
| 8 | Stopping Sight Distance | | 98 feet to 164 feet PA SR 1011  495 ft NY Rt 97  HDM §4.5 (Table 4-5), HDM §2.7.3 (Exhibit 2-5) | | 387 ft | 510 ft Rt1011  566 ft Rt97 | |
| 9 | Horizontal Clearance | | Not Required HDM §4.5 | | 0 ft | 0 ft | |
| 10 | Vertical Clearance | | 14 feet min, 14’-6” Desirable  BDM §2.4 (Table 2-2) Non-NHS | | 13 ft | 14’-6” | |
| 11 | Pavement Cross Slope | | 1.5% to 2.0%  HDM §4.5 (Note K.) | |  | 2.0% | |
| 12 | Rollover | | Between travel lanes = 4.0% maximum.  At edge of travel lanes = 8.0% maximum  HDM §4.5 (Note L.) | |  | 0% @ EOL across bridge, 4% max @EOL appr | |
| 13 | Structural Capacity | | NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle | | 7 tons | PHL-93 | |
| 14 | Level of Service | | LOS - “C” HDM §4.2 (Table 4-1)  Cars, Emergency and Service Vehicles  One Lane Highway <50 ADT | | “C” | “C” | |
| 15 | Control of Access | | N/A | | N/A | N/A | |
| 16 | Pedestrian Accommodation | | N/A | | None | 5’ sidewalk | |
| 17 | Median Width | | N/A | | N/A | N/A | |
| (1) Table 4-3 is provided in Appendix E-5  (2) The Regional Traffic Engineer has concurred that the use of a Design Speed of 10 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume. | | | | | | | |

#### 3.2.3.3. Other Design Parameters –

There are no other design parameters considered at this time.

## 3.3. Engineering Considerations

### 3.3.1. Operations (Traffic and Safety) & Maintenance

#### 3.3.1.1. Functional Classification and National Highway System -

This project will not change the functional classification of the highway.

#### 3.3.1.2. Control of Access –

No control of access will be provided.

#### 3.3.1.3. Traffic Control Devices

##### 3.3.1.3. (1) Traffic Signals

No new traffic signals are proposed.

##### 3.3.1.3. (2) Signs

Existing signage will be replaced. Curve warning and speed advisory signs will be supplemented.

#### 3.3.1.4. Intelligent Transportation Systems (ITS) –

No ITS measures are proposed.

#### 3.3.1.5. Speeds and Delay –

Travel time estimates have not been performed since the feasible alternative is not expected to adversely affect the capacity of the existing roadway network. Additionally, travel time estimates are not applicable for a bridge replacement project. The posted 10-mph speed limit will not be affected by the project.

#### 3.3.1.6. Traffic Volumes –

Traffic volumes for the build condition are not expected to vary significantly from the no-build condition presented in Exhibit 2.3.1.6.

#### 3.3.1.7. Level of Service and Mobility –

##### 3.3.1.7. (1) At Project Completion & Design Year –

Design year traffic volumes are expected to be the same as the future no-build design year volumes presented in Chapter 2. The improvements occurring as a result of this project are not expected to draw significant additional traffic to this route, since the number and width of travel lanes will not be increased, the roadway geometry will not be improved substantially, and the development potential in the area is limited. Roadway design year LOS are expected to be the same as future no-build design year traffic.

Roadway bridge AADT data is shown in the following Exhibit 3.3.1.7.(1)-A.

| Exhibit 3.3.1.7.(1)-A | |
| --- | --- |
| Year | LOS/AADT |
| Pond Eddy Structure | |
| Existing  (2013) | C / 68 |
| ETC + 30  (2045) | C / 106 |

##### 3.3.1.7 (2) Work Zone Safety & Mobility –

###### A. Work Zone Traffic Control Plan –

Traffic on the Pond Eddy Bridge will be maintained on existing roadway surfaces for the duration of construction. No detours or long-term lane closures are anticipated to be required (nor are they feasible) to construct the new roadway segments. Traffic would be controlled with short-term, daily lane closures and flagging operations. A posted detour is not expected (or feasible).

Details pertaining to work zone traffic control during construction – including recommended staging and sequencing of construction – will be developed during final design of the project. The proposed traffic control scheme on S.R. 97 will require review and approval from NYSDOT as well as a Highway Work Permit. Due to the close proximity to residential homes and the ability to maintain traffic with acceptable delays during the daylight hours, nighttime construction is not anticipated.

Any staging schemes or access restrictions should be coordinated with emergency service providers, transit agencies, and school districts during the final design phase as well as construction. At a minimum, coordination should take place with:

Town and Municipal Fire Departments

Local Police Departments

Local County Sheriff Offices

New York State and Pennsylvania State Police

Local School Districts

The project does not include work within a designated Transportation Management Area (TMA); therefore, further coordination for Significant Projects as defined in 23 CFR 630.1010 is not necessary.

#### 3.3.1.8. Safety Considerations, Accident History and Analysis –

Desirable clear zone widths will be provided where constraints allow. According to Table 10-1 of the NYSDOT Highway Design Manual the Recommended Basic Recovery Width is 8 feet for this project. Where minimum clear zones cannot be provided, any obstructions will be appropriately shielded. The final determination of the design clear zone width will be made during the final design phase. Approach guide rail and bridge rail would be brought up to current design standards.

#### 3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access –

The project will have minimal impact on emergency services providers. During construction, the work zone traffic control may have a slight impact on response times. Project implementation will provide a safe, structurally sound crossing to access the isolated residents of Pond Eddy, PA. The proposed replacement bridge will be constructed in accordance with current design criteria for safety and load carrying capacity, thus eliminating the posted weight limit, and affording viable access for public facilities and services.

#### 3.3.1.10. Parking Regulations and Parking Related Issues –

No changes in parking restrictions are proposed by the project.

#### 3.3.1.11. Lighting –

No changes are proposed.

#### 3.3.1.12. Ownership and Maintenance Jurisdiction –

Ownership and maintenance responsibilities for the existing bridge and approaches, including any improvements, would remain as described in Section 2.3.1.12 of this report.

#### 3.3.1.13. Constructability Review –

PennDOT has commissioned an internal constructability review with the consultant engineering team and determined that it is practical and feasible to replace the existing bridge. The project work elements are expected to be routine, the work area should not be overly-confining or restrictive, and the schedule is not expected to be compressed. A final constructability review will be performed by the proposed construction inspection staff during the final design phase of the project.

### 3.3.2. Multimodal

#### 3.3.2.1. Pedestrians –

No separate pedestrian accommodations will be provided. Pedestrians will be accommodated via the existing Pond Eddy Bridge during project construction. Following the completion of the proposed replacement bridge, pedestrians will be accommodated on a sidewalk.

#### 3.3.2.2. Bicyclists –

No separate provisions to accommodate bicyclists are proposed. The occasional bicyclist can be accommodated on the roadway or proposed shoulders.

#### 3.3.2.3. Transit –

No changes to local transit services are proposed as part of the project.

#### 3.3.2.4. Airports, Railroad Stations, and Ports –

There are no airports, railroad stations or port entrances within the project study area.

#### 3.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, and State Lands) –

A section of the Delaware State Forest and Pennsylvania State Game Land No. 209 are located within relatively close proximity of the Pond Eddy Bridge on the PA side of the Delaware River. This bridge replacement will provide improved access to these areas.

### 3.3.3. Infrastructure

#### 3.3.3.1. Proposed Highway Section –

This is a bridge replacement project. The typical section consists of one 15’-8” lane with a 5’-0” sidewalk. Typical section of the proposed bridge structure is provided in Appendix A-8.

##### 3.3.3.1. (1) Right of Way –

There are no displacements associated with this project. Partial acquisitions (both temporary and permanent) are expected from approximately 3 parcels. Partial acquisitions are expected along NY Route 97 and at the proposed bridge tie-ins. It is anticipated that the proposed right of way acquisitions qualify for a DeMinimis determination.

| Exhibit 3.3.3.1 (1)  Right-of-Way Acquisitions | | | | | |
| --- | --- | --- | --- | --- | --- |
| Alternative | Property | Owner  Reputed Owner | Type of Acquisition | Estimated Acquisition Area | Estimated Cost  (2013 dollars) |
| Replacement | 22.-5-1 | Sullivan County, NY | Fee  Permanent & Temporary | 1 acre | TBD |
| Replacement | 22.-6 -6 | Volodimir Litvyn | Fee  Permanent & Temporary | 0.25 | TBD |
| Replacement | 22.-4-17 | Jolene Properties, Inc. | Fee  Permanent & Temporary | 0.25 | TBD |

##### 3.3.3.1. (2) Curb –

The typical section is a 15’ 8” travel lane and a 5’ sidewalk. The typical section for the proposed bridge is included in Appendix A-8.

##### 3.3.3.1. (3) Grades –

The proposed maximum grade on the bridge will be 2±%. Minimum grades will be 0.5% for positive drainage. Profiles of the roadway can be found in Appendix A-8.

##### 3.3.3.1. (4) Intersection Geometry and Conditions –

The existing intersection geometry at the bridge approaches will be revised. The replacement bridge will be located upstream approximately 22 feet from the existing bridge; therefore, construction of the new Pond Eddy structure will create minor shifts of turning radii with PA S.R. 1011 and NYS S.R. 97; and alignment with connecting roadways (C.R. 41 and Hollow Road).

##### 3.3.3.1. (6) Roadside Elements:

(a) Snow Storage, Sidewalks, Utility Strips, Bikeways, Bus Stops –

There is no room for snow storage on the structure. There are currently no sidewalks, utility strips, or bus stops on the structure. The width of the replacement structure will be minimized to the extent practicable to avoid and minimize river and visual impacts. Even with the narrowed width of the replacement bridge, pedestrian and utility use would be accommodated. The proposed structure would include a 5’ sidewalk.

(b) Driveways –

There are two businesses adjacent to NYS Route 97 and Pond Eddy Bridge intersection. Driveway access would be adjusted accordingly to maintain safe access with the re-aligned intersection.

(c) Clear Zone –

Desirable clear zone widths will be provided where right-of-way and environmental constraints allow. According to Table 10-1 of the NYSDOT Highway Design Manual the Recommended Basic Recovery Width is 8 feet for this project. Where minimum clear zones cannot be provided, any obstructions will be appropriately shielded. The final determination of the design clear zone width will be made during the final design phase.

#### 3.3.3.2. Special Geometric Design Elements

##### 3.3.3.2. (1) Non-Standard Features –

The bridge roadway width is a Non-Standard feature. See the Non-Standard Justification Form in Appendix F-1.

##### 3.3.3.2. (2) Non-Conforming Features –

No features within the project limits would be created that do not conform to standard engineering practice or other design parameters described in Section 3.2.3.2.

#### 3.3.3.3. Pavement and Shoulder –

This is a bridge replacement project with a minor intersection adjustment. The typical section will include bridge surface in accordance with 3.2.3.2. and the Bridge Manual. The intersection roadway pavement would be developed in accordance with the NYSDOT design manual. Preliminary plans for the bridge replacement and intersection tie-in with NYSDOT Route 97 and PA S.R. 1011 are provided in Appendix E-4.

#### 3.3.3.4. Drainage Systems –

Overall drainage patterns within the project limits will not be altered

The project will involve greater than one acre of soil disturbance; therefore, a State Pollution Discharge Elimination System (SPDES) permit for construction activities will be required. The permit requirements include preparation of a Stormwater Pollution Prevention Plan (SWPPP), installation of temporary and permanent soil erosion and sediment control measures, water quality treatment, and water quantity controls.

#### 3.3.3.5. Geotechnical –

No special techniques or considerations are anticipated at this time. A geotechnical evaluation would be completed as part of the final design process and geotechnical requirements would be incorporated into the final design of the structure.

#### 3.3.3.6. Structures - BIN – 5228710

The existing Bridge is a two-span, pin-connected, Pennsylvania (Petit) through truss. The proposed replacement structure would be built to the west side of the existing allowing for traffic to be maintained on the existing structure during construction.

##### 3.3.3.6. (1) Description of Work –

Full replacement of the existing bridge

(a) Type of bridge, number of spans, etc. –

2 span Truss with one lane section and sidewalk.

(b) Width of travel lanes, shoulders, and sidewalks –

Total Bridge width of 25’-0” center to center of truss

Utilities carried –

Verizon currently has one conduit attached to the bridge which will be relocated

during construction.

##### 3.3.3.6. (2) Clearances (Horizontal/Vertical) –

The overhead vertical clearance above the bridge deck shall exceed 14’. The elevation of the bottom of bridge beams shall not be reduced from its existing elevation. This is necessary to maintain adequate freeboard. The horizontal clearance on the bridge deck will be the shoulder width of 5’-8” total, or 2’10” each side. See the Typical Section in Appendix A-8, drawing TS-1.

##### 3.3.3.6. (3) Live Load –

AASHTO HL-93 and NYSDOT Design Permit Vehicle

##### 3.3.2.6. (4) Associated Work –

The existing bridge’s piers shall be removed to the bottom channel elevation of the river. The highway approach pavement shall be reconstructed with asphalt concrete. Elevation changes at the Route 97 intersection will be run out an appropriate distance of 100 to 200 feet. Preliminary plans for the bridge replacement and intersection tie-in with NYSDOT Route 97 and PA S.R. 1011 are provided in Appendix E-4.

##### 3.3.3.6. (5) Waterway –

The Upper Delaware River is identified as a Navigable River. No negative permanent impacts on navigation will occur as a result of this project. Temporary disturbance to the recreational boating use would occur during the time of construction. Coordination with the National Park Service remains on-going and will continue through the final design portion of the project to develop a mutually agreeable aid to navigation plan to insure boating safety through the construction phase of the project.

#### 3.3.3.7. Hydraulics of Bridges and Culverts –

FIRM mapping (Appendix A-7) indicates the presence of a FEMA-delineated, 100-year floodplain along the Delaware River. H&H analysis of the proposed replacement bridge indicates that there will be no impact to the 100-year floodplain of the Delaware River. Therefore, this project would be in compliance with New York's Floodplain Management Criteria for State Projects (6 NYCRR Part 502).

#### 3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators –

All guiderail within the project limits including bridge railing will be evaluated during final design for conformance to design standards.

#### 3.3.3.9. Utilities –

One facility attached to the existing bridge will be relocated. Aerial lines along the NY Route 97 may be impacted.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Exhibit 3.3.3.9  Location of Potential Utility Impacts | | | | | |
| Owner | Type (Denote OH/UG) | Location | Side | Length (m) | Impact |
|  | Verizon | On bridge |  | 500 feet | Relocation |

#### 3.3.3.10. Railroad Facilities –

There is no railroad involvement anticipated with this project. The proposed bridge replacement would not encroach upon the existing railroad alignment to the south of the bridge connection to S.R. 1011 on the PA side of the Delaware River.

### 3.3.4. Landscape and Environmental Enhancements –

Landscaping will be provided as a part of the overall enhancement and aesthetic improvement efforts at the approaches to this project.

#### 3.3.4.1. Landscape Development and Other Aesthetics Improvements –

Project implementation will result in minor impacts to riverside and roadside vegetation in the area of the proposed bridge construction activities and contractor staging site. Mitigation for these impacts will include re-grading and reseeding all disturbed areas. Reseeding activities will include native vegetation, if practical and be conducted in accordance with Section 804.2(b) of PennDOT's Specifications Manual (Publication 408).

#### 3.3.4.2. Environmental Enhancements –

NYSDOT will work with Sullivan County and the National Park Service to identify a new public river access/boat launch area along the NY bank, if desired by all parties. Establishment of a new boat launch is not part of the Pond Eddy Project.

### 3.3.5. Miscellaneous –

# – SOCIAL, ECONOMIC AND ENVIRONMENTAL CONDITIONS AND CONSEQUENCES

## 4.1. Introduction

The following sections discuss how the project to provide a structurally sound bridge to carry S.R. 1011 over the Delaware River will impact the social, economic and environmental condition of the surrounding area.

### 4.1.1. Environmental Classification

**NEPA Classification**

This Federal Aid project is being progressed as a Level II Categorical Exclusion Evaluation (CEE). Documentation of the supporting studies is included as technical appendices (Appendix B). The FHWA approved CEE is included in Appendix B-12.

**SEQRA Classification**

NYSDOT is the lead SEQRA Agency for the project. This project is a SEQRA Non-Type II Action in accordance with 17 NYCRR Part 15 - Procedures for Implementation of State Environmental Quality Review Act. SEQRA Non-Type II projects include actions for which the environmental impacts are not clearly established and require an Environmental Assessment (EA). The project is being progressed as SEQRA Non-Type II (EA) because:

The PA Route 1011 bridge has been is listed in the National Register of Historic Places. Under 17 NYCRR Part 15.14(d)(6), a Type II action has “no effect on any district, site, structure or object that is listed, or may be eligible for listing, on the National Register of Historic Places.” This project, with its effect to the bridge, does not meet the Type II criteria, and is therefore classified as a Non-Type II (EA) project.

The SEQRA EA approval process requires a determination of no significant effect (DONSE) that is to be filed by the NYSDOT.

## 4.2. Social

The Pond Eddy Bridge, BIN 5228710 connects New York State Route 97 with Pennsylvania State Route 1011 (connecting New York with Pond Eddy, a small community in Pennsylvania). S.R. 1011 is a rural roadway and NYS Route 97 is a state designated Scenic Byway. The bridge provides the only public access to Pond Eddy, which is comprised of 24 properties including access to Pennsylvania State Game Lands No. 209 and adjacent State Forest Lands. The Pond Eddy Bridge, BIN 5228710 is listed on the National Register of Historic Places as a representative example of a multiple span Pennsylvania (Petit) truss bridge of moderate length. This section of the Delaware River has been designated at the national level as the Upper Delaware Scenic and Recreational River and at the state level as an official Pennsylvania Water Trail. A comprehensive evaluation of alternatives was completed for the project and PennDOT has determined in coordination with NYSDOT to replace the existing bridge. The replacement bridge will be built adjacent to the existing bridge, requiring a moderate approach road realignment, and embankment to raise the elevation of the replacement bridge.

There are no displacements; partial property acquisitions (both temporary and permanent) are expected from approximately 3 parcels. Partial acquisitions are expected along NY Route 97 and at the proposed bridge tie-ins.

### 4.2.1. Land Use

Demographics and Affected Population

Map analysis and field reconnaissance revealed no productive agricultural land within the immediate bridge replacement project area. No other agricultural resources were identified within the project area. The project will not require a Notice of Intent under the New York State Agriculture and Markets Law. Project implementation will result in minor impacts to riverside and roadside vegetation in the area of the proposed bridge construction activities and contractor staging site.

There is limited development north of NYS Route 97 but there are no residential buildings located within the project limits or directly adjacent to the project.

**Comprehensive Plans and Zoning**

The replacement of the existing bridge is located approximately 22 feet upstream of the existing crossing. The horizontal and vertical alignment for the replacement is consistent with the local communities’ comprehensive plans and will not affect local zoning.

### 4.2.2. Neighborhoods and Community Cohesion

The project will not divide neighborhoods, isolate part of a neighborhood, generate new development or otherwise affect community cohesion. The proposed alternative will require no displacement of residences or businesses and there will be no relocation impacts.

### 4.2.3. Social Groups Benefited or Harmed

The project is not located in or near an environmental justice area. Bridge replacement projects to improve motorist safety and preserve existing access are generally considered to be consistent with planned growth.

#### 4.2.4.1. School Districts and Places of Worship

Bridge replacement projects to improve motorist safety and preserve existing access are generally considered to be consistent with planned growth. In New York State the proposed project is within the Eldred Central School District. In Pennsylvania the [Delaware Valley School District](http://www.greatschools.org/pennsylvania/milford/Delaware-Valley-School-District/) is the educational institution. There are no schools or school properties within or adjacent to the project area. The bridge is not a link between school districts. The proposed replacement bridge would allow for school bus access to the PA side of the Delaware River. There are no places of worship on the Pennsylvania side of the Delaware River. On the New York side of the Delaware River, the Pond Eddy United Methodist Church is located approximately 2,100 feet upstream of the Pond Eddy Bridge crossing. The proposed bridge replacement will not impact the church.

#### 4.2.4.2. Recreational Areas

A section of the Delaware State Forest and State Gameland No. 209 are located within a relative close proximity of the Pond Eddy Bridge on the PA side of the Delaware River. As noted above, project implementation is not anticipated to result in any permanent impacts to either of these properties. The Buckhorn Natural Area of Delaware State Forest is also located within a relative close proximity of the Pond Eddy Bridge on the PA side of the Delaware River. As noted above, project implementation is not anticipated to impact this state forest natural area. Analysis of the National Park Service's National Registry of Natural Landmarks (1994) indicated that there are no National Natural Landmarks within the bridge replacement project area. The Upper Delaware River is a Scenic and Recreational River protected under the federal Wild and Scenic Rivers Act. Impacts to the Upper Delaware River are detailed in Sections 4.4.2 and 4.4.3 of this chapter. The Delaware State Forest, PA State Gamelands and the Upper Delaware River are protected as Section 4(f) Resources.

## 4.3. Economic

### 4.3.1. Regional and Local Economies

Project implementation will result in the creation of a number of construction-related jobs during the course of the project.

### 4.3.2. Business Districts

There are no business districts located within the project area on either the New York or Pennsylvania side of the river.

### 4.3.3. Specific Business Impacts

There will be no specific business directly impacted by the bridge replacement. There are businesses that provide rafting and canoeing on the river. PennDOT in coordination with NYSDOT and the National Park Service will coordinate with these local businesses to identify river access and restrictions during construction. Impacts to recreational boating would be temporary and full river access would be established after construction.

## 4.4. Environmental

#### 4.4.1.1. State Wetlands

There are no NYSDEC regulated freshwater wetlands or regulated adjacent areas (100ft) within the project area, as per the NYSDEC Freshwater Wetlands Maps for Sullivan County, Pond Eddy Quad., and the NYSDEC online Environmental Resource Mapper. No further investigation is required

#### 4.4.1.2. Federal Wetlands

The proposed project is located within the Delaware River Basin Commission’s jurisdictional area, and any impacts due to this project must comply with these regulations.

Four wetlands were delineated along the Delaware River within the project area (Appendix A-6 and B-7). The U.S. Army Corps of Engineers reviewed the delineation and determined that the wetlands and the Delaware River are regulated Waters of the United States. Wetlands A and D are located in close proximity to the proposed location for the new structure. These wetlands may be temporarily impacted during construction. Any permanent impacts would be minimal (less 0.05 acres). Temporary impacts may occur to approximately 0.2 acres of Wetland D as a result of the temporary causeway installed for construction access. This area would be expected to return to existing conditions once the causeway is removed. Impacts will be minimized by following an approved Erosion and Sedimentation Control Plan. It is anticipated that the proposed bridge replacement activities would be authorized with by U.S. Army Corps of Engineers with a Section 404 Nationwide Permit #3 - Maintenance Activities in all Waters of the U.S. A pre-application meeting with the U.S. Army Corps of Engineers would be scheduled during the final design phase of the project to confirm permit requirements.

**Executive Order 11990**

According to the conditions of Executive Order 11990 (EO 11990), projects with Federal involvement must avoid, minimize and mitigate for wetland impacts. The project is designed to avoid permanent impacts to wetlands delineated within the project limits. Therefore the project is in compliance with EO 11990 requirements.

### 4.4.2. Surface Waterbodies and Watercourses

The Pond Eddy Bridge carries S.R. 1011 over the Upper Delaware River. Map analysis and field reconnaissance revealed Mill Brook confluences with the river approximately 300 feet upstream of the proposed bridge replacement. No other surface waters were identified within the bridge replacement project area. According to the PA DEP's Chapter 93 Water Quality Standards, this section of the Delaware River has protected water uses for warm water fishes (WWF) and migratory fishes (MF). Analysis of the NYSDEC's Water Quality Standards and Classifications (6 NYCRR Chapter X, Part 815) indicates that this section of the Delaware River has been designated as a Class A best use water having A standards. Mill Brook flows into the Delaware River from the New York side approximately 300 feet upstream of the Pond Eddy Bridge. Mill Brook has been designated as a Class B best use water having B(T) standards. Neither the Delaware River nor Mill Brook is stocked with trout by the PFBC or the NYSDEC.

Penn DOT in coordination with NYSDOT formed a Design Advisory Committee to solicit local input on the structure type and aesthetic appearance for the bridge replacement structure. The DAC identified two bridge options including a 2 span truss and a 3 span steel girder bridge. PennDOT and NYSDOT have agreed to advance the 2 span truss through the final design process. The replacement structure would be positioned upstream of the existing bridge, such that the existing bridge can be used to accommodate traffic during project construction. Once the new bridge is constructed, the existing Pond Eddy Bridge will be dismantled for potential use at another location.

Given the scope of this project, the impact to the Delaware River will be directly related to the construction of the new bridge and its associated supporting pier. For the purposes of this evaluation, a replacement bridge approximately 28 feet in total width is assumed. Permanent impacts will be limited to the 28-foot bridge width for the crossing length of the river (approximately 530 feet), as well as the direct impact associated with the placement of one new bridge pier in the river. Temporary impacts to the Delaware River will occur as a result of the construction causeways that will be required to construct the new bridge and then dismantle the existing bridge. The exact location, extent, and design of the causeways will be determined during the Final Design process. The following table identifies the temporary and permanent impacts associated with the bridge replacement.

Delaware River Impacts

|  |  |
| --- | --- |
| Temporary Impacts | 91,500 square feet  (150 feet upstream to downstream and 530 feet across the river)  Accounts for construction access for demolition of existing bridge and assembly of new bridge |
| Permanent Impacts | Span Impact = 14,840 square feet (28 feet upstream to downstream and 530 feet across the river)  Direct Impact (pier placement) = 112 square feet (1 piers X 4 feet wide X 28 feet long) |

PennDOT will work with the NPS and PFBC to develop an Aids-to-Navigation (ATON) Plan to address recreational navigability and potential boater safety issues associated with the temporary use of the river via implementation of the causeway during project construction.

The Delaware River is protected by the NYSDEC under the Protection of Waters Program, Article 15 of the Environmental Conservation Law (ECL) implementing regulation 6 NYCRR Part 608. The NYSDOT and NYSDEC have a Memorandum of Understanding (MOU) that exempts the DOT from applying for permits but mandates consultation occur for protected waters. As such, consultation will occur with the NYSDEC concurrent with the PA DEP's Chapter 105 waterway encroachment permitting process (Appendix B-5).

### 4.4.3. Wild, Scenic, and Recreational Rivers

Project implementation involves the replacement of the existing National Register-listed Pond Eddy Bridge, which carries S.R. 1011 over the Upper Delaware Scenic and Recreational River, a unit of the National Park Service (NPS). The Upper Delaware Scenic and Recreational River consists of 73.4 miles of free-flowing river beginning at the confluence of the East and West Branches at Hancock, New York, and extending downstream to Railroad Bridge No. 2 in the vicinity of Mill Rift, Pennsylvania. A component of the National Wild and Scenic Rivers System since November 10, 1978, the Upper Delaware Scenic and Recreational River is under the administrative jurisdiction of the NPS but is managed in cooperation with a number of partnering agencies, including the Upper Delaware Council. The Wild and Scenic Rivers Act identifies those rivers that have Outstanding Remarkable Value. The Upper Delaware River is the only major river along the entire North Atlantic coast that remains undammed along its main stem and is one of only a few river segments in the northeastern United States to have been designated as a component of the National Wild and Scenic Rivers System. To receive such recognition, a river and its surrounding environment must possess resources of outstanding quality, including scenic, recreational, geologic, fish and wildlife, and/or historic and cultural resources.

Recognized for its scenic quality and abundant recreational opportunities, the Upper Delaware Scenic and Recreational River consists of riverfront villages set among a backdrop of forested hills ranging in elevation from 500 to 2,000 feet. Major recreational opportunities in the river corridor include sightseeing, boating, camping, hunting, fishing, hiking, and bird watching. The river corridor is especially noted for its resident Bald Eagle population and Roebling’s Delaware Aqueduct at Lackawaxen, Pennsylvania. Recreational opportunities within the immediate vicinity of the Pond Eddy Bridge consist predominantly of boating (i.e., canoeing, kayaking, rafting, tubing, etc.) and fishing for traditional warmwater river species (i.e., smallmouth bass, walleye, sucker, etc.).

With respect to the recreational boating opportunities associated with the Upper Delaware Scenic and Recreational River, it is important to note that this section of the Delaware River has also been designated as a Pennsylvania Water Trail by the PFBC. Water trails are boat routes suitable for canoes, kayaks, and small motorized watercraft. Like conventional trails, water trails are recreational corridors between specific locations. Water trails are comprised of access points, boat launches, day use sites, and, in some cases, overnight camping areas. Each water trail is unique, a reflection of Pennsylvania’s diverse geology, ecology, and communities. The official trail sponsor for the Delaware River Water Trail is the Delaware River Greenway Partnership

Specifically, the proposed bridge replacement project will involve the removal of the existing Pond Eddy Bridge, and the placement of a new bridge pier in the Delaware River. From a temporary impact perspective, project construction activities will require the establishment of construction causeways for river access. To address these permanent and temporary river impacts, PennDOT, FHWA, and NYSDOT, have met with the NPS to discuss avoidance and minimization of measures. It was agreed upon through the Section 4(f) Evaluation process, that the further evaluation of avoidance and minimization measures associated with the bridge type, span lengths and pier arrangement, would occur during the final design and permitting phase of the project.

Penn DOT in coordination with NYSDOT formed a Design Advisory Committee to solicit local input on the structure type and aesthetic appearance for the bridge replacement structure. The DAC identified two bridge options including a 2 span truss and a 3 span steel girder bridge. PennDOT and NYSDOT have agreed to advance the 2 span truss through the final design process. PennDOT will work with the NPS and PFBC to develop an Aids-to-Navigation (ATON) Plan to address recreational navigability and potential boater safety issues associated with the temporary use of the river via implementation of the causeways during project construction.

Coordination with the NPS has been ongoing throughout the development of the Pond Eddy Bridge Project. Project-specific coordination meetings were held with the NPS on April 24, 2007 and July 25, 2011. At these meetings, the impacts of the proposed bridge replacement project, as well as potential mitigation measures, were discussed. Minutes from this NPS coordination meeting are attached for documentation purposes.

### 4.4.4. Navigable Waters

The U.S. Army Corps of Engineers has classified the Delaware River as a navigable waterway from the Atlantic Ocean upstream to Hancock, NY. Project-specific coordination with the U.S. Coast Guard (see Appendix B-6) has determined that the Delaware River in the vicinity of the Pond Eddy Bridge is not considered navigable, and the Pond Eddy Bridge Project would not be subject to a U.S. Coast Guard Bridge Permit. Recreational navigability has been recognized on this section of the Delaware River through its classification by the PFBC as an official Pennsylvania Water Trail. Coordination with the NPS and PFBC will occur during Final Design to develop an ATON Plan to accommodate recreational navigation during project construction.

Within New York, the NYSDEC has regulations that require permits for navigable waters under the Protection of Waters Program Article 15, which will be covered as part of the mandatory consultation required pursuant to the NYSDOT/NYSDEC MOU discussed under the Streams, Rivers and Watercourses category (Appendix B-5).

Temporary impacts to navigability may occur during bridge replacement. However, no permanent impacts to navigability will occur as a result of the project.

### 4.4.5. Floodplains

The placement of the new replacement structure will encroach within the 100-year floodplain. No increase in the 100-year water surface elevation is anticipated and therefore considered in compliance with New York's Floodplain Management Criteria for State Projects (6 NYCRR Part 502) and Executive Order 11988. Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the encroachment and modification of floodplains. FIRM mapping (Appendix A-7) indicates the presence of a FEMA-delineated, 100-year floodplain along the Delaware River. Preliminary hydrologic and hydraulic (H&H) modeling indicates that backwater and flooding impacts will be avoided with the bridge replacement. Supporting information related to the H&H analysis is provided in Appendix B-9.

### 4.4.6. Coastal Resources

There are no coastal zones in this part of Pennsylvania or New York. The proposed project is not located in a State Coastal Zone Management (CZM) area, according to the Coastal Zone Area Map from the NYS Department of State’s Coastal Zone Management Unit.

### 4.4.7. Groundwater Resources, Aquifers, Wells, and Reservoirs

The Delaware River has been designated by the NYSDEC as a Class A best use water. The best usages for Class/Standard “A” waters are: source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The water quality is suitable for fish propagation and survival. The PA DEP's Chapter 93 Water Quality Standards identifies this section of the Delaware River as protected water uses for warm water fishes (WWF) and migratory fishes (MF).

Mill Brook flows into the Delaware River from the New York side approximately 300 feet upstream of the Pond Eddy Bridge. Mill Brook has been designated as a Class B best use water having B(T) standards. Neither the Delaware River nor Mill Brook is stocked with trout by the PFBC or the NYSDEC.

Similarly, a two-mile buffer of the Delaware River has been designated by U.S. EPA as part of the New Jersey Coastal Plain Sole Source Aquifer. No impacts to potable water supplies or groundwater resources are anticipated as part of this bridge replacement project. Coordination with the U.S. EPA regarding the project's location within the New Jersey Coastal Plain Sole Source Aquifer is ongoing (Appendix B-8).

There are no municipal drinking water wells, wellhead influence zones, or reservoirs within or near the project area, according to the *NYS Atlas of Community Water System Sources*, dated 1982, issued by the NYS Department of Health

### 4.4.8. Stormwater Management

Erosion and sedimentation control plans will be developed and efforts to minimize erosion and sedimentation impacts resulting from project construction will include following proper construction sequencing and implementing the Erosion and Sedimentation Pollution Control Plan approved by the Pike County Conservation District and in accordance with PA DEP criteria. Within New York, the Erosion and Sedimentation Pollution Control Plan must be accepted by the NYSDOT in accordance with the Memorandum of Understanding (MOU) between NYSDOT and the NYDEC under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity.

### 4.4.9. General Ecology and Wildlife Resources

Map analysis and field reconnaissance revealed no wildlife sanctuaries/refuges or critical/unique habitat within the project study area. A project review using the HGIS-PNDI database resulted in the identification of potential impacts with species under the jurisdiction of the USFWS and PFBC (Appendix B-4). Coordination with the USFWS indicated potential concerns related to the Dwarf Wedge Mussel and Bald Eagle (Appendix B-4). Specifically, the USFWS requested that an updated mussel survey be conducted due to the time that has elapsed since the original survey was completed in 2002. A mussel survey was completed in September 2011 and no threatened or endangered mussels were identified within the project area. The USFWS also requested that the project team evaluate the proposed bridge replacement project with regard to the National Bald Eagle Management Guidelines to ensure no conflicts with nesting bald eagles in the vicinity of the project.

The project was reviewed by the NYSDEC via the Division of Fish, Wildlife & Marine Resources Natural Heritage Program. Their response indicated that the project may require additional studies related to the Alewife Floater and Brook Floater (Appendix B-4). Coordination with the NYSDEC revealed that they do not give clearance or coordinate further until permits are submitted. Coordination with the PFBC was conducted for the project and the PFBC issued their clearance for the project for species under their jurisdiction (Appendix B-4).

### 4.4.10. Critical Environmental Areas

According to information obtained from NYSDEC, the proposed project does not involve work in or near a Critical Environmental Area. There are no Critical Environmental Areas in Sullivan County.

### 4.4.11. Historic Bridges, Archaeological, and Cultural Resources

The proposed project involves the construction of a new bridge structure immediately upstream of the existing National Register-listed Pond Eddy Bridge, such that the existing bridge can be used to maintain traffic during project construction. As part of final design, PennDOT would implement a bridge marketing plan in an effort to identify a responsible party for taking over ownership and maintenance responsibility for the existing bridge at a new location. If a responsible party could not be identified, the existing Pond Eddy Bridge would be dismantled and a demolition plan would be developed in final design.

Consultation with the PA and NY SHPOs has determined that, pursuant to Section 106 regulations (36 CFR part 800), the proposed bridge replacement project would have an Adverse Effect on the National Register-listed Pond Eddy Bridge. A Memorandum of Agreement (MOA) has been signed by NYSDOT and NYSHPO to document the mitigation commitments to address the project's Adverse Effect. Supporting Section 106 consultation information is provided in Appendix B-2.

Mitigation for the project's Adverse Effect upon the National Register-listed Pond Eddy Bridge is documented within the MOA. Specific mitigation commitments listed in the MOA include marketing the reuse of the bridge, recordation, and the formation of a Design Advisory Committee to oversee the aesthetic components of the final bridge design. The MOA also stipulates archaeological monitoring during project construction to identify, evaluate, and document any features of the Delaware & Hudson (D&H) Canal that may be exposed by construction activities and to carry out consultation to consider appropriate treatment of any archaeological properties that may be encountered. A copy of the fully executed MOA is attached for documentation purposes (Appendix B-3).

This project does not have to potential to impact any Historic Parkways.

**Section 4(f) Involvement**

The proposed bridge replacement project will involve the removal of the existing Pond Eddy Bridge, and the placement of a new bridge pier in the Upper Delaware Scenic and Recreational River, a unit of the National Park Service (NPS). From a temporary impact perspective, project construction activities will require the establishment of construction causeways for river access. To address these permanent and temporary Section 4(f) uses, the Final Individual Section 4(f) Evaluation (January 2012) was approved by the FHWA by letter dated February 2, 2012 (Appendix B-1). The Individual Section 4(f) Evaluation describes the subject Section 4(f) resources in detail, evaluates a number of Section 4(f) resource avoidance alternatives and minimization measures, and outlines the proposed project's Section 4(f) mitigation commitments.

**Native American Involvement**

In accordance with Section 106 requirements for consultation with federally recognized tribes, FHWA notified the Delaware Nation, Delaware Tribe, Eastern Shawnee Tribe of Oklahoma, Oneida Nation of Wisconsin, and the Seneca-Cayuga Tribe of Oklahoma of the project, and the Delaware Nation and Delaware Tribe participated in Section 106 consultation. No properties of religious or cultural significance were identified within the project’s area of potential effects.

### 4.4.12. Parks and Recreational Resources

The proposed project will not impact areas identified as State Heritage Areas. There are no listed nationally significant natural areas within, or adjacent to, the project area. The project does not impact parklands or facilities that have been partially or fully federally funded through the Land and Water Conservation Act. No further consideration under Section 6(f) is required. There is no Section 1010 involvement associated with this project because the project does not involve the use of land from a park to which Urban Park and Recreation Recovery Program funds have been applied.

Project implementation involves the replacement of the existing Pond Eddy Bridge, which carries S.R. 1011 over the Upper Delaware River. The Upper Delaware River is designated as a National Scenic and Recreational River and a Pennsylvania Water Trail. The proposed bridge replacement project will involve the removal of the existing Pond Eddy Bridge, and the placement of a new bridge pier into the Delaware River. From a temporary impact perspective, project construction activities will require the establishment of construction causeways for river access. PennDOT & NYSDOT will work with the NPS and PFBC to develop an ATON Plan to address recreational navigability and potential boater safety issues associated with the temporary use of the river via implementation of the causeway during project construction

### 4.4.13. Visual Resources

Project opponents have expressed concern relative to the visual impact associated with the loss of the historic bridge structure. As such, PennDOT agreed to the formation of a Design Advisory Committee (DAC) to oversee the development of the aesthetic component of the proposed replacement bridge. The Pond Eddy Bridge is visible from the adjacent section of New York State Route 97, which is the state-designated Upper Delaware Scenic Byway. The bridge is documented as a significant intrinsic visual and historic resource in the Upper Delaware Scenic Byway’s Corridor Management Plan. The DAC resulted in the selection of two bridge types for DOT’s consideration: three span steel girder bridge and a two span truss. The DOT’s have decided to advance the 2-span truss into final design for the project. The Visual Impact Assessment documents the visual impacts associated with the bridge replacement alternative Appendix B-10.

The Visual Assessment documents the consideration of visual impacts for the project and demonstrates the means for which the NYSDOT undertook to incorporate viewshed aesthetics within the project development process. The Visual Impact Assessment was developed to follow the guidelines outlined in the Federal Highway Administration Visual Impact Assessment for Highway Projects Manual, 1981. The assessment considers the existing visual resources and receptors associated with the existing Pond Eddy Bridge Crossing and the visual aesthetics of the proposed bridge replacement with the solicited input from the Design Advisory Committee stakeholders.

The bridge replacement will result in an impact to the existing visual resource, the existing Pond Eddy Bridge. The selected dual truss replacement bridge design serves as a visual mitigation. It will offer the closest visual experience to the removed historic bridge. The existing bridge is viewed as an authentic visual resource for the area. Though some viewers may not be pleased with any replacement alternative as they are with the existing bridge; the replacement of the bridge is unavoidable, and despite the loss, the anticipated visual quality will remain high. The visual impact assessment demonstrated that both replacement options recommended by the DAC results would result in a moderately high to high quality visual experience but the dual truss alternative would have less of a visual impact when compared to the three-span steel girder.

### 4.4.14. Farmlands

Based on a review of the NYS Agricultural District Maps for Sullivan County, the proposed project is not located in or adjacent to an Agricultural District. The proposed project activities will not convert any prime or unique farmland, or farmland of state or local importance, as defined by the USDA Natural Resources Conservation Service, to a nonagricultural use.

No other agricultural resources were identified within the project area. The project will not require a Notice of Intent under the New York State Agriculture and Markets Law.

### 4.4.15. Air Quality

The subject project has been identified as being exempt from air quality analysis in accordance with 40 CFR 93.126. It can therefore be concluded that the project will have no significant adverse impact on air quality. The proposed project is located in an attainment area for PM2.5/PM10 standards. The project does not require a project level conformity determination. According to the PM2.5 and PM10 hot-spot analysis requirements established in the March 10, 2006, final transportation conformity rule (71 FR 12468) no further project level air quality analysis for these pollutants is required.

### 4.4.16. Energy

The proposed project involves the replacement of an existing crossing over the Upper Delaware River. The project will not significantly impact energy utilization.

### 4.4.17. Noise

The proposed project involves the replacement of an existing bridge structure essentially on the same location (22 feet upstream of the existing structure). This project is not a Type I project, as defined by 23 CFR 772 and does not require a formal noise study. As such, project implementation is not anticipated to result in any lasting or permanent noise impacts. Construction-related noise will be temporary in nature, and occur during normal daytime working hours.

### 4.4.18. Asbestos

An asbestos screening has been performed for this project and it has been determined that there are no areas of potential asbestos material. Apart from lead-based paint on the existing Pond Eddy Bridge, no hazardous or residual waste issues were observed or identified within the project study area.

### 4.4.19. Contaminated and Hazardous Materials

A Hazardous Waste/Contaminated Materials Site Screening has been conducted in accordance with the NYSDOT Environmental Procedures Manual, Chapter 5, in order to document the likely presence or absence of hazardous/contaminated environmental conditions. A hazardous/contaminated environmental condition is the presence or likely presence of any hazardous substances or petroleum products (including products currently in compliance with applicable regulations) on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property.

No hazardous waste/contaminated materials were identified within or adjacent to the project area during the course of the Hazardous Waste/Contaminated Materials Site Screening. The potential risk for involvement with documented or undocumented inactive hazardous waste/contaminated materials is low. PennDOT does not believe that additional studies or investigations are warranted. Apart from lead-based paint on the existing Pond Eddy Bridge, no hazardous or residual waste issues were observed or identified within the project study area.

## 4.5. Construction Effects

The construction of the replacement structure will require in-stream access to the Delaware River. The existing bridge will be used during construction to maintain local access to Pond Eddy, Pennsylvania, thereby avoiding the need for a temporary bridge. In-stream causeway access will be needed for construction. The construction access will be temporary and upon completion of the replacement structure, all causeway and construction access encroachments will be removed from the river. Construction effects are anticipated to be temporary in nature and no long-term adverse impacts to the river are anticipated.

## 4.6. Indirect (Secondary) Effects

There are no adverse Indirect Socioeconomic Effects, Social Consequences, or economic consequences associated with this project.

## 4.7. Cumulative Effects

The replacement of the S.R. 1011 – Pond Eddy bridge crossing will provide safe efficient access to the community of Pond Eddy, Pennsylvania. The access will provide the opportunity for basic and emergency services. The replacement structure will be designed to maintain existing flows through the crossing location and avoid adverse flooding impacts. No adverse cumulative effects are anticipated.

**APPENDICES**

Appendix A – Maps, Plans, Profiles, Typical Sections

A-1: Project Location Map

A-2: Meeting Exhibit – Aerial Photograph Map

A-3: Pond Eddy Joint Interstate Bridge Plans Set

A-4: Representative Photographs

A-5: Preliminary Engineering – CEE Bridge Crossing Plan

A-6: Wetland and Watercourse Location Map

A-7: FEMA Floodplain NTM Map

A-8: Plans, Profiles and Typical Sections

PL-1 through PL-3 – Roadway Plans

PR-1 through PR-3 – Roadway Profiles

BR-1 – Pond Eddy Bridge Plan & Elevation

TS-1 – Typical Sections

Appendix B – Environmental Information

B-1.1: Final Individual Section 4(f) Evaluation

B-1.2: Appendices for the Final Individual Section 4(f) Evaluation

B-2: Section 106 Findings Documentation

B-3: SHPO and ACHP Coordination

B-4: Threatened and Endangered Species Coordination

B-5: DEC – SEQRA Screening Documentation

B-6: U.S. Coast Guard Correspondence

B-7: Wetland Determination

B-8: EPA Correspondence

B-9: Hydraulic and Hydrologic Analysis

B-10: Visual Impact Assessment

B-11: Pedestrian Checklist

B-12: Categorical Exclusion Evaluation

Appendix C – Traffic Information

C-1: Traffic Information

C-2: Traffic Accident Information

Appendix D – Pavement Information - No information provided

Appendix E – Structural Information

E-1: Existing Pond Eddy Bridge Plan

E-2: Pond Eddy Bridge Engineering Reports and Studies

E-3: Proposed Dual Truss and Three Span Steel Bridge Structures

E-4: 2 Span Truss Plan, Section and Profile – May 2013

E-5: Design Criteria Table 4-3

Appendix F – Non-Standard Features Justification

F-1: Bridge Roadway Width

Appendix G – Public Involvement Plan and Input from Stakeholders, including public

Appendix H – Right of Way Information

H-1: NY Tax Parcel Map

H-2: NY Tax Parcel Information

H-3: PA Tax Parcel Map (Map 1)

H-4: PA Tax Parcel Map (Map2)

H-5: PA Tax Parcel Information