



To: PennDOT
From: Delaware Riverkeeper Network
Date: July 8, 2016
Regarding: Headquarters Road Bridge Over Tincum Creek

The Delaware Riverkeeper Network requests that PennDOT include the Headquarters Road – Sheephole Road – Burnt Mill Road bridge in the Stone Arch Bridge program, and protect, rehabilitate and restore it as part of that important statewide initiative, pursuant to which PennDOT has the needed funding, authority and construction expertise. This unique, 200 year old historic structure is:

- ✓ a pier to pier bridge that is very rare in the Commonwealth of Pennsylvania and the nation, perhaps one of only two left;
- ✓ part of a complete collection of waterway crossings representing the entire history of crossings since the birth of the nation to present day, a collection which the Delaware Riverkeeper Network believes may exist nowhere else in country;
- ✓ a key contributing resource to the Ridge Valley Rural Historic District; and
- ✓ an important underpinning of the Lower Delaware Wild & Scenic Designation that includes Tincum Creek.

The Delaware Riverkeeper Network submits this additional set of comments and expert reports to further support its long-held support for the rehabilitation approach, which will avoid the increased costs, delays and known legal challenges associated with demolition of the historic Bridge and its replacement with an oversized 2-lane structure. Our materials address the following:

- The Determination of Effects Report (DOE) dated November 2015;
- The A.D. Marble & Company Memorandum dated June 20, 2016;
- The Comment Response Document dated June 23, 2016; and
- The apparent decision by PennDOT to pursue Alternative 6, a strategy that requires demolition and replacement of the historic and irreplaceable Headquarters Road Bridge.

Given that PennDOT focuses on only 2 options, Alternative 6 and Alternative 3, our comments are similarly focused.

Introduction.

PennDOT's most recent set of documents continue to demonstrate PennDOT's unwavering commitment to the *Demolition - Replacement alternative* (hereafter Demolition-Replacement Option or Alt 6) and its unwillingness to consider any information or perspectives that demonstrate legally, factually, economically and scientifically that this is not the right outcome. The better choice is the *Historic Rehabilitation alternative* (hereafter Rehabilitation Option or Alt 3). Consequently, the Delaware Riverkeeper Network continues to provide the kind of expert, legal, and factual analyses and comments necessary to make a solid record that will encourage PennDOT to change its mind, and/or to best support a future legal challenge.

PennDOT Improperly Pre-Selected the Demolition-Replacement Alternative.

Evidence shows that PennDOT selected the demolition-replacement alternative prior to initiating the review process, and has been acting in bad faith in order to achieve this pre-determined outcome. The Delaware Riverkeeper has long been concerned that when PennDOT initiated the NEPA, NHPA and DOT Act processes to select a preferred alternative for Headquarters Road Bridge, it did so with a predetermined outcome in mind: replacement. Two documents have recently come to our attention that support that theory and show that PennDOT never intended to consider rehabilitation, despite broad public and Consulting Party support.¹

1. Urban Engineers issued an inspection report in August 2006 and recommended replacement. However, in the Project Specific Agreement E00342 dated March 23, 2005 - well prior to that 2006 report - PennDOT contracted with Urban Engineers to *replace* three bridges in Bucks County, including Headquarters Road, for \$1.3M.
2. In the Technical Proposal Detail Report from July 2013 for Agreement E00342, the Scope of Work (page 9) directs subcontractor A.D. Marble & Company that the outcome of the report will be that there are no feasible or prudent alternatives:

The Section 4(f) Evaluation will evaluate alternatives developed by the project team and will incorporate information and coordination with local authorities. The alternative analysis section will include detailed design plans depicting each alternative impact on each of the Section 4(f) resources. If there are no feasible and prudent alternatives to avoid the use of Section 4(f) resources, mitigation measures will be developed. *This report will document that there are no feasible or prudent alternatives to the use of Section 4(f) resources for this project* [emphasis added].

These materials show that PennDOT intended to replace the Bridge from the start and never gave real consideration to rehabilitation as a feasible and prudent alternative, as required by DOT Act Section 4(f).

¹ Both documents are available on PennDOT's Engineering and Construction Management System (ECMS).

Rehabilitation Is Clearly A Better Option to Build a Safe Bridge Efficiently.

If the goal is to build a safe Bridge – as soon as possible, with the best economic justification, and to meet all legal requirements – rehabilitation is clearly the superior alternative. The new set of expert reports submitted by the Delaware Riverkeeper Network continues to make clear the safety, economic, and community values of the Rehabilitation Option. This information, added to the wealth of information already provided by the Delaware Riverkeeper Network and PennDOT's acknowledgment that Rehabilitation is a viable option – so much so that it is put forth as one of the choices to be considered by the agency – makes clear that Rehabilitation is the wisest path forward for PennDOT, Tinicum Township, and the Lower Delaware River watershed community.

McMullen Associates provides new support for rehabilitation in the attached expert report. Given McMullen Associates' stature as an expert in this field that has worked on projects subject to greater rehabilitation needs and/or load bearing capacity, their multiple assessments and reports, all supported by onsite inspections, make a strong case to support the Rehabilitation Option. This alternative fulfills the requirements of historic preservation, while at the same time serving the transportation needs of the community.

Likewise, cost information from PennDOT and independent sources demonstrates the cost benefits of a Rehabilitation approach. In the absence of cost information from PennDOT, the Delaware Riverkeeper Network hired Griffin Engineering to do a real world cost comparison of the two options. Griffin Engineering, using carefully documented and current materials and labor costs, determined the Rehabilitation Option to be far more cost effective at a price comparison of \$2,704,306 as compared to \$3,458,762, a difference of \$754,456. Recently, PennDOT finally released cost figures with similar findings: Demolition–Replacement costs of \$2,388,690 as compared to Rehabilitation costs of \$1,779,000, a difference of \$559,690. PennDOT's figures are based on outdated information which accounts for the difference between the two figures. Even given the dated and less project-specific nature of PennDOT's figures, however, it is clear that Griffin's analysis is sound and that there is a significant savings in the Rehabilitation approach.

Delaware Riverkeeper Network experts have also identified, that in the best case scenario for both options regarding site access, permitting, environmental restrictions, community acceptance etc, that the Rehabilitation Option can be implemented faster (9 months vs 12 months). But, again, that is assuming no opposition or issues – and we of course know that there will be strong community opposition, including legal challenge, to the Demolition-Replacement Option should PennDOT pursue that path.

As a complement to the Rehabilitation Option, PennDOT concerns regarding the turning radius of the north intersection of the Bridge can be addressed by more effective means, including some road widening on the north side of the intersection of the Bridge with Sheephole Road. A Preliminary Design based on site investigation and experienced expertise has been provided by the Roberts Engineering Group which demonstrates that this strategy is viable and accommodates the Ottsville Fire Company truck, a desired outcome of the project as a whole.

Furthermore, natural channel design and stream restoration strategies will alleviate and avoid the scour and erosion issues PennDOT seeks to address at the Headquarters Road Bridge. These proven approaches can address the flow, erosion and scour issues PennDOT identifies, while at the same time providing enhanced habitat, flow and water quality benefits for the Exceptional Value Tincum Creek. Using natural channel design will address the erosion, scour and flow issues without creating new downstream erosion and property damage that Alt 6 would cause.

Given the higher regulatory hurdles and more intense permitting required by the Demolition-Replacement Option; the more extensive NEPA, Section 106, and Section 4(f) reviews that demolition requires and which have yet to be accomplished; the intense public opposition to the Demolition-Replacement Option; and the failure of PennDOT to meet all of its legal obligations both procedurally and substantively, which will lead to litigation, it is clear the Rehabilitation Option will result in a completed project much more quickly, and will better accomplish PennDOT's goals as well as the goals of the community.

Natural Channel Design and Stream Restoration Are Important Solutions that Solve the Erosion and Scour Problems, and Negate the Need for the Proposed Damaging Infrastructure.

The Delaware Riverkeeper Network has repeatedly advocated consideration of natural channel design and stream restoration strategies that would alleviate and avoid the scour and erosion issues PennDOT points to at the Bridge, while at the same time provide habitat, flow and water quality benefits for the Exceptional Value and Wild & Scenic Tincum Creek. A Rehabilitation Option that includes natural channel design and stream restoration would preserve the historic Bridge, enhance the quality, habitat and flows of Tincum Creek, and avoid the adverse impacts of the Demolition-Replacement Option. And yet, PennDOT continues to ignore this effective strategy for addressing scour and erosion issues in a value-added way.

To best address the stability of Tincum Creek at the Bridge, both hydrologic design and natural channel design can be utilized to help determine the best way to guide the creek to the desired path under the Bridge.

“Natural stream channel design addresses the entire stream system. It is based on fluvial geomorphology, which is the study of a stream’s interactions with the local climate, geology, topography, vegetation, and land use -- how a river carves its channel within its landscape. The underlying concept of natural stream channel design is to use a stable natural channel as a blueprint or template.”²

A number of natural channel design techniques should be evaluated. Options include placing boulders to redirect flow towards the middle of the channel, limiting bank erosion. “Cross vanes provide grade control, keep the thalweg in the center of the channel and protect streambanks from erosion.”³ These boulder interventions can be combined with native plantings along the stream banks for long term stability and habitat enhancement. Stream bank stabilization options

² *Guidelines for Natural Stream Channel Design for Pennsylvania Waterways, 2002*

³ *Stream Restoration, A Natural Channel Design Handbook, North Carolina State University*

include brush layering and similar bioengineering techniques to form a stable vegetated stream bank.

Among the natural channel design strategies that PennDOT should be considering:

1. Cross Rock Vane – V or U shaped

“The V-shaped diversion of this natural weir effectively transports stream flow while maintaining the transport of sediment. The cross-vane is a grade control structure that decreases near-bank shear stress, velocity and stream power, but increases the energy in the center of the channel. The structure will establish grade control, reduce bank erosion, create a stable width/depth ratio, maintain channel capacity, while maintaining sediment transport capacity, and sediment competence. The cross-vane also provides for the proper natural conditions of secondary circulation patterns commensurate with channel pattern, but with high velocity gradients and boundary stress shifted from the near-bank region.”⁴

- Limits bank erosion.
- Directs stream power to center of channel.
- Useful to align streams with bridges

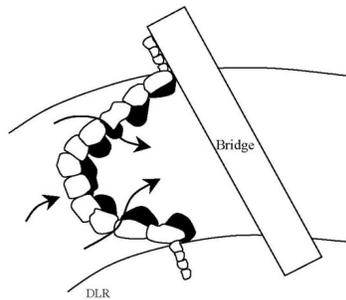
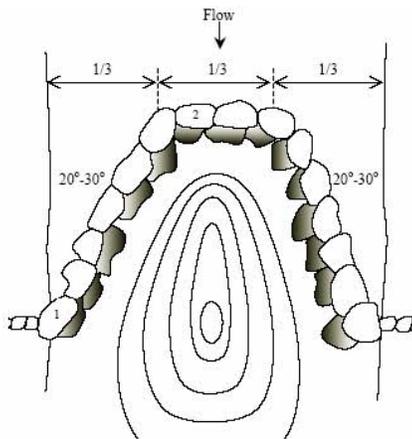


Figure 16. Application of a Cross-Vane for bridge and channel stability.

Source for Graphic left:
*The Cross-Vane, W-Weir
and J-Hook Vane
Structures... Their
Description, Design and
Application for Stream
Stabilization and River
Restoration*, D. L. Rosgen,
P.H.*

Source for graphic above &
right: *Streambank Stabilization
Management Measures*, Arizona
DEQ
<http://nemo.snr.arizona.edu/nemo/BMPdocs/StreambankStabilizationManagementMeasures>



⁴ *Streambank Stabilization Management Measures*, Arizona DEQ
<http://nemo.snr.arizona.edu/nemo/BMPdocs/StreambankStabilizationManagementMeasures.pdf>



Cross Rock Vane at Niokaska Creek Restoration Project⁵

Below is a photo of a linear cross vane placed on an angle to the flow. It may be used to re-direct flow direction, while protecting the stream bank; it prevents erosion while maintaining sediment transport. This cross-vane is tied into existing rocks along a stream bank.



Big Bear Creek, Lycoming County, PA

Source: Stream Restoration in Pennsylvania: Ten Case Studies, Delaware Riverkeeper Network

2. W-Wier

A W-Wier is essentially two V-shaped cross vanes, and “may be used to accommodate flow into bridges with multiple support buttresses” (NRCS), or to protect infrastructure such as utility lines paralleling a stream (as at the DRN project in Darby Creek). It redirects the flow into the center of the channel, and may be used at the Headquarters Road Bridge to prevent bank erosion and meander.

⁵ Water Conservation Resource Center, Arkansas at http://www.watershedconservation.org/proj_gulley.html



Figure 21: South Platte River "W" weir, 2005

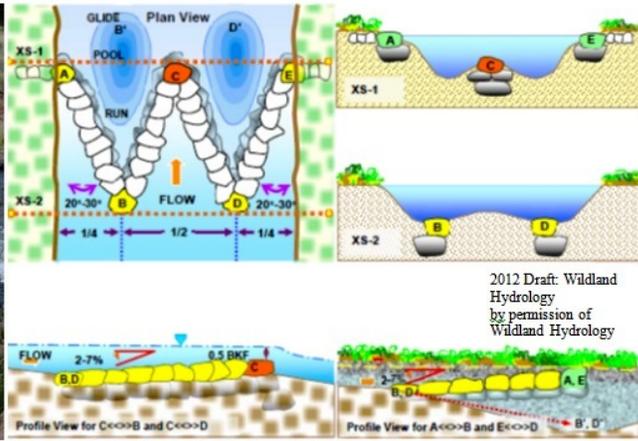
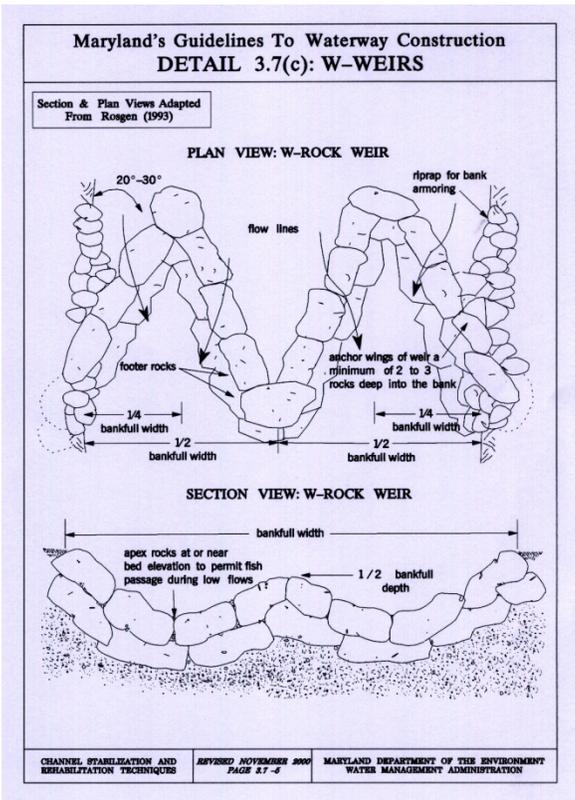


Figure 22: "W" weir illustration of design components

2012 Draft: Wildland Hydrology
by permission of
Wildland Hydrology



Natural Channel and Floodplain Restoration, Applied Fluvial Geomorphology, by NRCS at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/manage/restoration/?cid=stelprd_b1247762

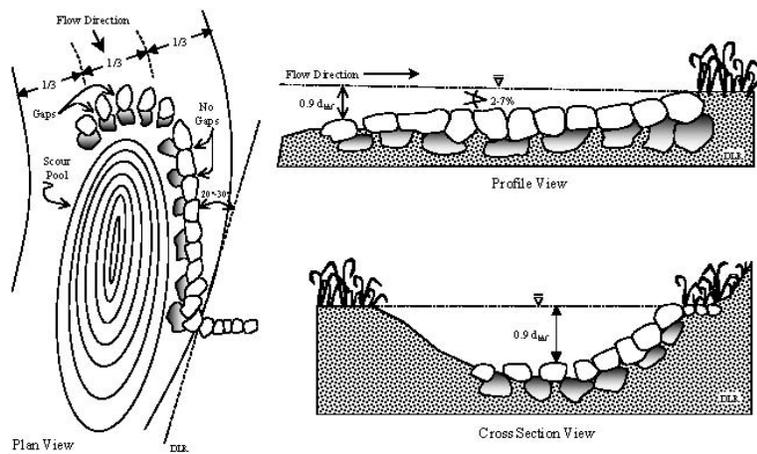
Source for Graphic Above: *Maryland's Guidelines to Waterway Construction*, Maryland Department of the Environment

3. J-Hook Vane

A J-Hook Vane may be useful to re-direct flow pattern, while protecting the banking. It includes boulders placed along a banking as well as in a J pattern in the center of the channel.



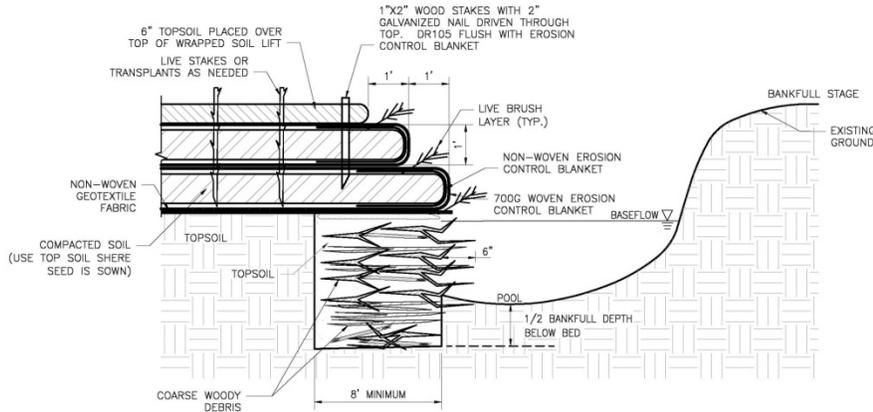
Photo Source: NC Stream Restoration Institute at <http://www.bae.ncsu.edu/programs/extension/wqg/sri/southfork.htm#photos>



Graphic Source: *Natural Channel Design Review Checklist*, US Fish and Wildlife Service

4. Soil and Brush Layering at Eroded Slope

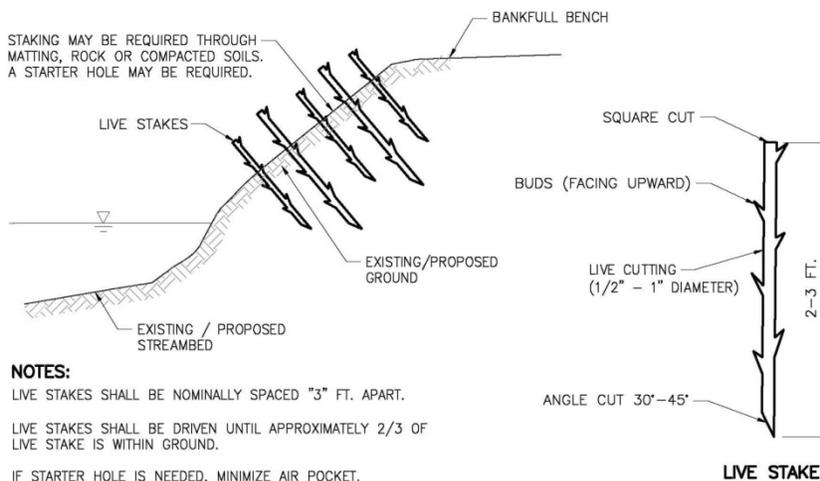
This technique includes brush layering, and fabric/soil layering, creating a stable banking while improving fish habitat. Planting is placed in the layers and grows to create a stable banking.



Soil and Brush Layering, Swamp Creek (DRN)

5. Live Stakes

Live Stakes are dormant shrubs and trees planted into a streambank for added stability and habitat enhancement.



Using fluvial geomorphology and natural channel design principals, PennDOT could design ecologically stable measures that re-direct the flow of the creek to the existing openings in the existing bridge and do so in a way that protects the bridge structure while at the same time providing ecological protections and enhancements to the creek. While these measures may require implementation outside the box drawn by PennDOT on its plans, they are measures that are designed and intended to affect the area immediately surrounding the bridge in an effort to solve the scour and erosion problem PennDOT has identified as a priority to address and would do so in a way that would be best protective of the historic piers and the EV Tinicum Creek. As such, natural channel design principles are not beyond the project area, the project limits or beyond the scope of the purpose and need.

PennDOT suggests that PADEP opposes the natural channel design approach (Response to Comments document 6/23/2016 Appendix A page 23 of 43), stating "efforts to realign the stream from its naturally meandered position to its original position are not recommended." We find it unusual that PADEP would suggest avoiding a practice that can improve stream alignment and habitat, while aligning the stream with bridge openings. From PennDOT's description of PADEP's position, we question the characterization PennDOT used to discuss the subject with PADEP and request information on the rationale and context of the purported PADEP recommendation. Were there meeting minutes (and if so please make these public)? Was this discussion in the context of avoiding a larger project area thus avoiding certain permits and costs? Was there a fluvial geomorphic study backing up PADEP's purported recommendation? Who was at the meeting from each agency? Etc.

Our experience with the accident data and PennDOT's blatant mischaracterization of that body of information, along with its extended efforts to prevent the Delaware Riverkeeper Network from securing that information for independent review, makes us highly skeptical of PennDOT's characterization of PADEP's position.

PennDOT responses regarding the grout bags installed around the piers confirms what the Delaware Riverkeeper Network has said: this kind of hardened and invasive response to erosion is not a sound or permanent solution for scour or erosion. The grout bags were apparently used in order to fill in scoured areas around the piers, but are themselves now the target and subject of stream scour, which is what individuals knowledgeable about stream and flow dynamics would expect.

PennDOT's Failure to Consider Impacts and Solutions Beyond the Narrow Project Area It Has Designated Prevents Mandated Consideration of Effective Options, and of Direct and Indirect Impacts That Will Result.

PennDOT stated in Response 11 on page 37 of the 6/23/2016 response to comments document:

"The project area for this project encompasses the area immediately surrounding the existing bridge. It is beyond the scope of the current project to incorporate natural channel design and stream restoration principles beyond the project limits."

But the fact is the “project limits” are merely a line on engineering drawings that allow PennDOT to focus on a designated area. They cannot be used to ignore upstream and downstream impacts associated with this project, and they cannot be used as justification to ignore viable options that can help address and accomplish the goals of the project. Natural channel design and stream restoration methods can effectively avoid adverse harms that would be inflicted by other studied options, including Alt 6, and can address the goals of the project including scour and erosion issues around the base of the bridge structure including its piers.

The admission on page 6 of the Response to Comments that PennDOT plans rip rap around the piers for every project alternative is shocking, to say the least. The 1-paragraph discussion of this intrusion into the stream does not reflect appropriate consideration of the adverse impacts to the stream, to stream habitat, or to flow dynamics. At no point when this concept is raised or referred to is that kind of necessary analysis undertaken. And there is no consideration of the other alternatives that can more effectively accomplish the erosion/scour protection that is intended, and do so without the damage this rip rap invasion will inflict on the stream. Asserting that the rip rap will be locally sourced, etc., is an inadequate consideration of the antidegradation obligations and historic preservation obligations of PennDOT.

There is No Demonstration that Flood Levels would Be Reduced by Alternative 6, As Asserted.

The response to comments document asserts that:

“Because Alternative 6 would remove a pier and abutment from the stream, it is anticipated that flood levels will decrease due to the removal of the obstructions.”

Analysis to support this assertion is not provided.

PennDOT Has Failed to Undertake the Stream Impact Analyses Necessary to Support Alternative 6. The Proposed After-the-Fact Analysis Fails to Fulfill the Requirements of Law. As Such, Demolition-Replacement is Not Supported by the Record.

PennDOT states Alt 6 will improve the “free flow of the creek”, without revealing the full extent of the altered flows PennDOT is proposing and without studying or discussing the negative impacts that will result. This deceptive failure to disclose is not appropriate for a state agency and undermines the public comment and decisionmaking process.

As noted by both Princeton Hydro and Meliora Design, PennDOT has failed to provide the analysis necessary to support their assertions regarding the impacts of Alt 6, and they fail to look at the adverse impacts. In some cases it seems clear that PennDOT has not undertaken the analyses required, in others they have provided information they acknowledge is outdated and no longer representative, and in still others it is unclear whether or not PennDOT has undertaken the necessary work because they have not shared it with the public.

Princeton Hydro and Meliora – in reports already submitted by the Delaware Riverkeeper Network and now supported with two new comments attached – discuss the upstream, downstream, and at-the-bridge impacts of the Demolition-Replacement option. Impacts include increased pollution from the road surface, instream erosion, increased stormwater runoff, increased soil compaction, increased stream velocities, erosion, altered stream flows, and impacts to instream and riparian habitats. PennDOT's assertion that Alt 6 is beneficial to the stream is in many ways demonstrably false and is certainly not supported by the science, facts, evidence or record.

The graphic "Alternative 6 Rendering (Elevation View)", coupled with the Figure 10 schematic in the June 20, 2016 AD Marble letter reveal, after careful scrutiny, that PennDOT's Alt 6 in fact depends on a significant shift of the stream, a shift so dramatic that it will obviously result in altered stream flows, streambank erosion, erosion of the downstream hedgerow/farmland, and all of the sedimentation, habitat injury and cascading impacts advancing downstream over time that will result. PennDOT never makes clear in its various written documents this intended dramatic change in the creek that is an intentional part of the Demolition-Replacement Option that is Alt 6.

It is noteworthy too that the "Alternative 6 Rendering (Elevation View)" does not include the full extent of the bridge length / wing walls. The information is in PennDOT's computer files, and would be easily presented, but PennDOT chose to NOT show the full extent of the wing walls and bridge, further obscuring the full impacts of Alt 6. This is a familiar pattern we have seen at previous bridge work by PennDOT in the Township – a failure to fully disclose.

According to PennDOT, PADEP is opposed to natural channel design strategies that will impact stream flows, but it never discusses PADEP's awareness of or reaction to the dramatic stream alteration they intend to inflict.

With regard to the intended shift of the stream, PennDOT asserts that debris will flow more easily as a primary demonstration of benefit, but fails to fully analyze the ramifications of the altered flow. PennDOT has not undertaken the full hydrological study, including fluvial geomorphology, of impacts from the altered flow, including impacts to stream flows, stream banks, stream health, water quality, instream habitat, riparian vegetation and riparian habitats. PennDOT has not discussed the stream banks and beds that will be eroded and/or scoured, including how many cubic feet of downstream and upstream bank will be eroded due to Alt 6, thus affecting water quality and negatively impacting downstream areas. PennDOT has not considered how far westward the stream will shift as a result of Alt 6 and what will be the effects on the land/features of the historic district. PennDOT has not discussed the ramifications for stream scour at the bridge due to increased flow.

While PennDOT may assert that many of these harms are beyond the "project limits" as it has done with other issues, that is not an acceptable response. The impacts will be a direct result of the Alt 6 option and its affect on the stream and stream flows – to discount these effects because they fall outside the box PennDOT has drawn on its set of plans does not fulfill PennDOT's legal obligations for review and consideration of this and other options.

Consideration of the impacts of the various alternatives after an alternative is selected is too late – impacts to the stream, floodplain, banks, flows, surrounding land uses, historic district, habitats, wildlife, aquatic life and the community must all be considered as part of the decisionmaking process, not after-the-fact. PennDOT’s assertion that it will undertake Hydrologic and Hydraulic Analysis, for example, only during the permitting process with PADEP ensures that PennDOT and the public will not have the data necessary to assess project impacts for decisionmaking purposes. The whole point of NEPA, 106 and Section 4(f) is to ensure consideration of impacts prior to decisionmaking, not after. A failure to fully and fairly consider these issues at this time is a violation of PennDOT’s legal review obligations, at the very minimum.

Concerns Regarding Piers Seems Disproportionate and Biased, as Does the Disregard For Expert Comments on Associated Issues.

While PennDOT seems very concerned about maintaining the two instream piers associated with the Rehabilitation Option it is similarly unconcerned with the creation of a new pier with the Demolition – Replacement Option. Among the concerns PennDOT articulates for the maintenance of the two historic piers in the Rehabilitation Option is the opportunity for debris to collect in the stream and have flow impacts – but this opportunity similarly exists with the one pier option, and in both cases is ultimately resolved by regular inspection and maintenance. In fact, Chapter 105 mandates that the owner of a bridge “shall inspect the opening and approach of the culvert or bridge at regular intervals of not less than once each year and shall, after obtaining the verbal or written approval of the Department, remove silt and debris which might obstruct the flow of water through the structure.” And so this obligation to prevent debris that will alter flows and create adverse impacts already exists and will exist for either Alt 3 or Alt 6.

Additionally, this focus on the piers fails to look at all of the other damaging elements of Alt 6 being proposed by PennDOT, including but not limited to: the new rip rap around the piers; relocation of the stream to accommodate the larger replacement bridge proposed in Alt 6; the increased impervious surface causing increased polluted and heated stormwater entering the creek inflicting water quality, flow and habitat impacts; the anticipated proposal to increase the connected road system from one lane to two lane in order to better accommodate traffic entering and leaving a two lane bridge.

PennDOT’s assertion that the instream construction impacts associated with the Alt 3 Rehabilitation Option would be similar to the Alt 6 Demolition-Replacement option is, on its face, misleading; PennDOT needs to provide significantly greater detail on the record to support this kind of blanket assertion.

PennDOT’s responses to the comments of Meliora Engineering regarding the impacts of Alt 6 are woefully inadequate – the detailed comments provided by Meliora are dismissed with unsupported statements that

- “there are aspects of your summary that we disagree with” and
- “the long-term permanent impact of the creek will be decreased with this alternative”

and an admission that

- “design flood elevations shown for each alternative were from previous studies and had not been updated”
- [W]ere inadvertently included on the plans
- [W]ill be omitted from the plan to avoid confusion.”

In sum, PennDOT presents a wholly inadequate response to the technical comments made, and a level of response that certainly does not support the decision to demolish the bridge and replace it with an oversized structure that will shift the creek in such a significant way.

PennDOT Claims Regarding Regulatory Requirements and Hydraulics Fail to Represent the Whole Picture.

The AD Marble 6/20/16 memo states that:

“The proposed approach to remove the two existing piers and replace them with one center pier improves water flow, which is required by PADEP per Chapter 105 regulations.”

In fact, if PennDOT were to construct a whole new bridge, an option that is not in fact necessary, it would have to do much more than simply “improve” water flow in order to comply with Pennsylvania Regulations.

Comments placed on the record by the Delaware Riverkeeper Network make clear that Alt 6 violates a number of Pennsylvania regulatory mandates for bridge construction or modification projects. Even with the limited information PennDOT has provided experts have noted that Alt 6 will increase water surface elevations in the 25 year event, the project will materially alter the natural regimen of the stream, Alt 6 will increase velocity and/or direct flows in a manner that will result in erosion of beds and banks, it will adversely impact floodplains, and the project would create and constitute a hazard of concern. All of these outcomes of Alt 6 are to be avoided according to Chapter 105 regulations.

Additionally, PennDOT’s assertions that the Demolition-Replacement Option is a benefit because of “reduction of potential scour” is undermined by its assertion that rip rap will be required around the pier because of the expectation of scour, fails to acknowledge and assess the ramifications of the shift of the stream that is hidden but proposed, and fails to recognize that the natural channel design option would provide a better level of protection.

PennDOT’s Avoidance of Obvious Alternatives Fails to Comply with NEPA. Other More Cost Efficient and Time Efficient Solutions Exist. Speculation Has Been Used Instead of Consideration.

PennDOT uses the need for further investigation as the excuse not to pursue the less invasive, quicker and less costly option of cutting the stone face along Sheephole Road to increase the turning radius. PennDOT said it did not consider bank cut backs to address the turning radius issue because “there is limited available right-of-way concern” regarding stability, and because the turning radius issue could be addressed by other strategies. All of these fail to justify ignoring this very viable option.

- The lack of pre-existing access to land because of available rights of way did not prevent PennDOT from fully exploring a number of demolition and new construction options, and cannot be used to justify ignoring this viable option.
- “Concern” about a limitation does not justify failing to consider an option, including determining if that concern is legitimate or not. Just because there might be a problem does not mean there is one.
- The fact that there are other options available to address the issue does not justify failing to consider an alternative. In fact, that is the reason that NEPA mandates consideration of alternatives: to ensure that an agency’s pre-determined bias and/or commitment to a particular outcome does not prevent it from considering other viable options, including those that would in fact be less invasive, less costly, less damaging options and as such better options for resolution of the matter.

Additionally, for this approach PennDOT is quick to cite concerns about the impact to the property owners, while for other options PennDOT seems to have a complete disregard for property owner considerations.

Before dismissing the option of addressing the turn on the north side of the bridge onto Sheephole Road, PennDOT has an obligation to consider it, should provide the property owner the information they would need to consider it, and should undertake the action necessary to confirm its viability.

The Delaware Riverkeeper Network, with our attached expert report, has undertaken a key piece of this work on your behalf to demonstrate that this is a viable approach, that can be accomplished and can be carried out in a way that could be appreciated by the property owner knowing it would be coupled with the Historic Rehabilitation Option.

PennDOT Continues to Base Rejection on AASHTO and Design Criteria Routinely Set Aside for Other Structures.

PennDOT continues to assert that rehabilitation of the historic Headquarters Road Bridge does not meet state guidance. For example, PennDOT asserts that Alt 3 is functionally obsolete because it does not meet the 24 feet curb to curb criteria found in PennDOT’s DM-2. But there are many roads and structures in the Commonwealth that do not meet this 24 feet curb to curb criteria. Just because a one lane bridge connected with narrow roads is not 24 feet wide does not mean it is “functionally obsolete”. In fact, the Headquarters Road Bridge well served the community as a one lane bridge up until PennDOT closed it; even with a dramatically reduced width imposed by the Jersey Barriers the bridge functioned and was far from obsolete. PennDOT routinely dismisses AASHTO and state design criteria to accommodate specific needs, such as the stone arch bridge program, so to use these criteria to suggest that a one lane bridge at this location is unserviceable to the community is absurd. Given that PennDOT has itself acknowledged that rehabilitation is a viable option, it is similarly unfounded to dismiss this option by asserting that a rehabilitated bridge would be structurally deficient even after PennDOT intervention and rehabilitation. Historic structures across the Commonwealth are preserved as the result of engineering, rehabilitation and intervention. To suggest that PennDOT is unable to accomplish a safe bridge at

Headquarters Road means that we should not trust any of the bridges PennDOT has rehabilitated anywhere in the State.

Community and Social Impacts are Measured Only by How Much Private Property PennDOT Will Take.

The Community/Social Impacts sections discussing Alt 3 and Alt 6 in the AD Marble memo dated 6/20/16 focus only on how much property will be taken from private property owners in order to accomplish the proposed option. Such a view of the impacts on the community is inappropriately limited.
limited.

PennDOT Cannot Assess Impacts of Decisions Yet to Be Made.

In the Response to Comments, PennDOT asserts that the removal of the two existing piers and the construction of a new pier in the same location as one of the removed piers is deemed “minimization of disturbance.” But in the same response, PennDOT states that the method of removal will be left to the contractor, with PennDOT monitoring. The lack of detail on the method of removal negates the ability of PennDOT to assess whether or not there will be a minimization of disturbance during construction. It is possible that a more invasive method will be used for pier removal. That PennDOT hopes to construct the new pier on the footprint of the old one does not mean that the removal and construction practices will result in a minimization of disturbance.

Accident Analysis Continues to Undermine PennDOT Credibility.

PennDOT’s continuing efforts to characterize the crash data in a light to advance the Demolition-Replacement Option is troubling to say the least. Tincum Township and Delaware Riverkeeper Network experts undertook detailed analyses of the 10 accidents on the bridge that PennDOT cites to claim there was a safety issue and found that claim groundless.

First, it is important to note the great lengths to which PennDOT went to deny the Delaware Riverkeeper Network access to these public records, so much so that our organization had to resort to legal resources to secure them. Once received, the accident data did not demonstrate a safety issue at the bridge that required construction of a new oversized bridge at this location. To the contrary, the fact that there were so few accidents on the bridge, let alone being the result of the bridge’s geometry or size, support our assertion that the traffic calming benefits of a single lane bridge at this location is a safety asset. Now PennDOT is seeking to rely upon vague, unverified suggestions of “a near accident” on the bridge and claims of undocumented potential impacts to the bridge by busses to justify this \$2.3M+ project. It is embarrassingly inappropriate for PennDOT to use vague assertions of undocumented (and yet still avoided) incidents as support for their inappropriate waste of natural resources and tax dollars.

Furthermore, for PennDOT to assert that because “several” local residents “feel the one-lane bridge is more dangerous and they desire a new two-lane bridge” as support for its decision is

again quite telling. Many more than several, in fact most,⁶ local resident who have commented on this issue have expressed the desire for preservation of the creek, preservation of the historic bridge, and preservation of the values the one lane historic structure brings for Tincum Township; in addition the community as a whole for centuries has supported maintaining the bridge, the creek and the locality's rural character through land planning, land preservation, local decisionmaking, and support for EV and Wild & Scenic designations of Tincum Creek. Even those who support a replacement bridge have expressed support for rehabilitating and preserving the one lane structure if it meant the bridge project could be completed, and the bridge opened, more quickly.

Second, while some may have said they "feel" the 1-lane bridge is more "dangerous," the facts tell a different story and in fact demonstrate that the bridge safely served the community with its current width, location and geometry.

Third, the law specifically mandates that PennDOT conduct the Section 106, NEPA and Section 4(f) processes before making its final determination. Had PennDOT fulfilled these legal mandates, there would be many more members of the community, as well as information regarding stream and community impacts, available to inform PennDOT's decision so that it did not have to rely upon the *feelings* of *several* people for such an important and expensive decision.

PennDOT's dismissal of the traffic calming benefits of the one lane bridge at this particular location because they would not have a "measurable impact on the travel speeds for the remainder of the roadway" fails to recognize that all traffic calming actions have an impact that is limited in time and space. For example, speed humps are recognized as only "a point speed control"⁷ and yet they are commonly used to slow traffic speeds at specific locations for a variety of reasons. To dismiss the traffic calming benefits of a narrow bridge along Headquarters Road where there is a pre-existing geometry that would benefit from traffic calming, and where measures that could speed up traffic would create an obvious safety hazard, is irresponsible.

Regarding the Ottsville ladder 49 truck, the Delaware Riverkeeper Network has provided statements by the fire chief that belie the assertion that the fire company believes they need this oversized bridge in order to be able to fully and safely service their community. (PennDOT questions the accuracy of the Delaware Riverkeeper Network's summary of the chiefs comments, but our multiple offers to talk to the chief again have gone unanswered.) In addition, the Delaware Riverkeeper Network has provided a much more cost efficient and ecologically sound strategy for accommodating easier turning by the ladder truck in the form of a new bank cut back. The evidence is solid on both fronts – there is no safety issue that mandates the oversized bridge option and there are other options for satisfying the needs PennDOT claims it is seeking to address. It makes no rational sense for PennDOT to continue to pursue an overpriced, unnecessarily damaging option that will result in a costly and time consuming set of legal challenges that PennDOT will have to defend and is unlikely to win.

⁶ In fact, being careful to count DRN's multiple comments as for one commenter, the response to comments document shows 7 commenters opposed to demolition and reconstruction with only 3 expressing support; the Township and PHMC were viewed as neutral on the subject.

⁷ http://safety.fhwa.dot.gov/ped_bike/univcourse/pdf/swless11.pdf

It Is Important for the Secretary to Confirm Her Support for the New PennDOT Decisionmaking Standard of “it is not possible to rule out”.

PennDOT’s continuing assertion that the few accidents that have occurred in the vicinity of the bridge support their proposal to demolish and replace the bridge demonstrates PennDOT’s inability to use facts to support its pre-determined outcome of demolition. For years, PennDOT has been making undocumented assertions regarding safety. DRN finally wrestled the accident data from PennDOT and was able to affirmatively demonstrate that this data in fact did not support an assertion of a safety issue that supported demolition and replacement. Now, PennDOT asserts that there is a safety issue because “it is not possible to rule out that there could be geometry and/or drainage issues....”

If we are now going to rely upon the “it is not possible to rule out” standard for decisionmaking, it would be important for the Secretary of DOT to officially adopt this new standard so we can use it for all of the data, discussions and decisions moving forward.

An Option that Demolishes the Bridge Will Undermine the Wild & Scenic Designation Granted the Lower Delaware River and Tincum Township.

Tincum Creek and the Lower Delaware River have been designated as “scenic and recreational” waterways under the Wild and Scenic Rivers Act (“WSRA”). Demolition of the historic Headquarters Road Bridge will have a direct and adverse effect on the values that supported designation of Tincum Creek and the Lower Delaware River within the Wild and Scenic River System. 16 U.S.C. § 1278(a).

The Ridge Valley Rural Historic District (“RVRHD”), of which the Headquarters Road Bridge is a contributing structure, is an outstandingly remarkable cultural and historic resource value for the Tincum Creek segment of the Lower Delaware River and supported the segment’s designation as a scenic river.⁸ In a November 4, 2013 presentation at a Consulting Party meeting, Kutztown University History Professor Rob Reynolds – an expert in historic preservation – explained the significance of the Bridge in relation to the RVRHD:

The current alignment of the Headquarters Road Bridge anchors the southern end of the Ridge Valley Rural Historic District. Removal of the bridge, installing a new bridge of modern design, altering the alignment, and changing the way the current bridge connects Headquarters Road, Sheep Hole Road, or Red Hill Road would be an adverse effect that could lead to delisting the district or reconfiguring the boundary for this area.

Professor Reynolds opines that this Bridge is a key element in the historic district:

The Headquarters Road Bridge remains an integral contributing resource of the Ridge Valley Rural Historic District. It is the oldest bridge of its type left in Pennsylvania and is one of only a few spans in America over 200 years old. The 1919 rebuilding of this bridge actually adds to, rather than detracts from, the integrity of

⁸ The Lower Delaware River Management Plan (August 1997), p. 51.

the structure. Those renovations tie this span to a larger transformation of creek crossings in the Ridge Valley Historic District, which mostly date to the early auto era. The demolition of this span and the installation of a modern bridge will cause an irreparable adverse impact to the stellar collection of creek crossings, which form the central axis of the Ridge Valley Rural Historic District.

Demolition of the Bridge will also threaten the ecological quality of the Tincum Creek, an exceptional value waterway. As stated by the Delaware Riverkeeper Network on the record:

The construction of a new bridge at Headquarters Road over Tincum Creek can potentially impact the aquatic ecosystem posing a risk to both the physic-chemical and ecological quality of Tincum Creek, an exceptional value waterway within the designated Lower Delaware National Wild and Scenic River system. The entire Tincum Creek watershed is ranked as first priority to protect in a countywide study (Rhoads and Block 1999) based on its variety of uncommon plant communities, large numbers of rare plant and animal species, and the exceptional quality of the water. Four hundred plant species and over 100 nesting bird species inhabit the watershed. The proposed new larger bridge replacement could have direct and adverse effects on water quality, river hydraulics, and aquatic organisms.

Construction of the proposed new bridge with a larger footprint of disturbance will have water quality impacts during the initial construction as well as long term impacts as a result of the bridge's presence (Wheeler et al. 2005).

In addition the Delaware Riverkeeper Network has submitted expert comments regarding pollution and adverse water quality impacts during and after construction; impacts to stream flows and aquatic habitat; impacts to flood levels, instream habitat, riparian habitats and floodplains; and impacts upstream and downstream.

PennDOT Unresponsive Response to Comments an Ongoing Concern

PennDOT's Response to Comment document often refers to other responses and documents that are not on point with a particular comment made, and as such there seems a deliberate effort to avoid important discussion and create unnecessary complications in assessing PennDOT responses. A prime examples of the kind of avoidance of an answer comes on page 5:

The comment at issues is discussing the jersey barriers installed in 2001 which significantly reduced the land width over the bridge. The comment notes that the 10 accidents which PennDOT has used as justification for his Demolition-Replacement Option all occurred after 2001 and that there "appears to be no evidence presented that the 16 foot lane width of the bridge prior to the jersey barriers had a similar site-specific safety problem. The fact that the accidents occurred on a 10 foot lane bridge which is not proposed in any of the alternates should be pointed out in the text."

PennDOT's Response says "See the response to Comment #1 on page 11." On page 11, Comment #1, we see a comment and therefore a response that in no way address the comment on page 5:

Comment: "We need a bridge for safety. There are so many unintended consequences to this bridge being out. Just as in the Geigel Hill Bridge outage, the local folks suffered financial and sometimes, life threatening hardships. And this is happening now."

Response: "Thank you for your comment. We understand the frustration that the closed bridge creates for the surrounding community."

This response clearly does not address the comment made on page 5 regarding the impact of the jersey barriers on accidents, PennDOT's misuse of the accident data, and PennDOT's failure to disclose all relevant information in this regard. This kind of obfuscation and misdirection is sadly commonplace throughout the PennDOT process regarding the Headquarters Road Bridge.

By way of additional example, regarding van Rossum Comment 5 and the PennDOT response:

"COMMENT #5: The Project alternatives all fail to consider environmentally beneficial strategies for addressing common problems across alternatives, such as the stream scour that happens around instream piers. In every instance PADOT suggests additional hardening protections around the piers which are detrimental to the aesthetics and historic integrity of the structures being considered and exacerbate environmental damage rather than mitigating, minimizing and avoiding harm. The Delaware Riverkeeper Network has repeatedly urged consideration of natural channel design strategies that could avoid and mitigate scour that result around and from the piers, and yet nowhere in this document or others does PADOT ever give this beneficial approach any consideration."

To which the response to comment document states:

"RESPONSE #5: See previous Response #6 on page 4."

In fact, there is no discussion of natural channel design in Response #6 on page 4; i.e. PennDOT does not consider controlling the flow towards the bridge and leaving the bridge to help avoid scour at piers, and to avoid negative impacts beyond the "project limits".

The Area of Potential Effects is Inappropriately Small - Both for Rational Decisionmaking and Per The Requirements of the Law.

The Area of Potential Effects (APE) is defined in the Section 106 implementing regulations as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." 36 C.F.R. § 800.16(d). The APE may be much larger than the project area if the undertaking has the potential to directly or indirectly affect properties located outside the immediate project area. In addition to direct physical effects on properties, an agency must also consider the full range of indirect visual and audial effects that may impact these properties. Indirect effects may occur at a later date and may be cumulative. PennDOT responses to comments from historic experts such as Kathryn Ann Auerbach, a preservation consultant with well-respected experience, knowledge and skills in the

field make clear that the agency is inappropriately limiting its APE definition and as a result ignoring significant, enduring and foreseeable impacts.

Is PennDOT Willing to Expressly Prohibit Large Trucks From Using The Headquarters Road Bridges?

In the Response to Comments, when addressing a concern that PennDOT is seeking to upgrade all of the area bridges as part of a larger strategy to accommodate future drilling equipment – a goal that would explain PennDOT’s unwavering commitment to demolition and replacement of the network of single lane historic bridges that otherwise evades understanding and reason – PennDOT denies the assertion. Accordingly, the Delaware Riverkeeper Network asks PennDOT to place an express prohibition on trucks the size of tanker trucks from using Headquarters Road and its bridges.

PennDOT’s Systematic Effort to Demolish and Replace Tinicum’s Historic Bridges Impact Exceptional Natural Resources

In its Response to Comments document, PennDOT asserts that that it is not pursuing a systematic effort to remove and replace with new construction a series of Tinicum Township bridges. It goes on to assert as evidence of its denial:

“A comprehensive impact review is beyond the scope of this project.”

A comprehensive review of the cumulative impacts of PennDOT’s projects in Tinicum, including the series of bridge demolition and replacement projects on the connected network of Tinicum Roads that are impacting the same travelers and the same natural resources, is exactly what is needed and required by NEPA. PennDOT fails to look at cumulative impacts of projects that are related in time, space and travel corridors, and can and should be viewed as part and parcel of a single effort that cannot be broken down into its separate segmented parts for purposes of NEPA review. PennDOT is aware of all of the projects it has proposed, ongoing and recently completed, and knows that each bridge expansion, like a domino, affects the next section of road and bridge. Yet it continues to look at each project separately, apart and piecemeal. PennDOT needs to take a comprehensive look, including considering related projects and cumulative impacts.

PennDOT Continues to Avoid Compliance with NEPA, Including in Needed Review and Its Assertion of a Categorical Exclusion.

PennDOT’s statement that it is coordinating its NEPA, Section 4(f) and Section 106 processes simply does not hold true. The Delaware Riverkeeper Network continues to challenge PennDOT to undertake these reviews in a concurrent and connected fashion as the law requires.

Specifically regarding NEPA, the Delaware Riverkeeper Network has repeatedly voiced its concern to PennDOT that the agency is not considering a sufficiently broad range of issues as required by NEPA, and is disregarding certain matters that clearly fall within NEPA claiming they are not pertinent as they are unrelated to Section 106. As a result, there has been no point at which the public, including the Delaware Riverkeeper Network, has been given the opportunity to submit information about environmental or community impacts of various alternatives in order

to inform the decision being made. Whenever we submitted such information or attempted to discuss such impacts, we were told by PennDOT that the information was inappropriate given its failure to address the historic aspects of the project pursuant to Section 106.

While PennDOT has already stated its intent to designate the project as a Level 2 Categorical Exclusion (CE) so as to avoid full and fair NEPA review, the specific facts applicable to the Headquarters Road Bridge make clear that a CE is not applicable.

Demolition and replacement of the Headquarters Road Bridge with a two lane structure, as proposed by PennDOT, would have a significant impact on natural, cultural, recreational and historic resources. It would significantly impact water quality, as well as inflicting other significant environmental impacts, and would impact travel patterns, causing increased speeds and perhaps increased traffic. As a result, 23 CFR § 771.117(a) clearly prohibits the use of a CE.

Even if FHWA were able to make a credible case for initial consideration of a CE, 23 CFR § 771.117(b) prevents its application. A number of circumstances make the application of a CE improper here, including that the PennDOT preferred option of demolition of Headquarters Road Bridge followed by construction of a 2-lane modern structure will have significant environmental impacts; is substantially controversial on environmental grounds; will have a significant impact on properties protected by section 4(f) of the DOT Act and section 106 of the National Historic Preservation Act; and/or involves inconsistencies with any Federal, State, or local law, requirement or administrative determination relating to the environmental aspects of the action.

In addition, a CE is inappropriate because to the extent CEs are generally applicable to bridge rehabilitation, 23 CFR § 771.117(e) mandates that reconstruction or replacement projects under § 771.117(c)(28) may not be processed as CEs if they involve, as is the case here:

(3) A finding of “adverse effect” to historic properties under the National Historic Preservation Act, the use of a resource protected under 23 U.S.C. 138 or 49 U.S.C. 303 (section 4(f)) except for actions resulting in *de minimis* impacts, or a finding of “may affect, likely to adversely affect” threatened or endangered species or critical habitat under the Endangered Species Act;

...

(6) A floodplain encroachment other than functionally dependent uses (e.g., bridges, wetlands) or actions that facilitate open space use (e.g., recreational trails, bicycle and pedestrian paths); or construction activities in, across or adjacent to a river component designated or proposed for inclusion in the National System of Wild and Scenic Rivers.

A recent letter from FHWA indicates that the project is proceeding properly under a “d list” CE, referred to in Pennsylvania as a Level 2 CE, under 23 CFR 771.117(d). Under this regulation, a CE is still inappropriate because the demolition and replacement of the Headquarters Road Bridge with a 2-lane structure, as proposed by PennDOT, would have a significant impact on natural, cultural, recreational and historic resources; on water quality; on travel patterns, causing increased speeds and traffic as prohibited by 23 CFR § 771.117(a); and on other elements of the Bridge and its surrounding roadways, waterways, and local community and environment.

Moreover, 23 CFR 771.117(d) states, “The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that *significant environmental effects will not result*” (emphasis added). In light of the data and analyses provided to PennDOT and FHWA by the Delaware Riverkeeper Network, other Consulting Parties, and many concerned local residents, it is quite plain that 23 CFR 771.117(d) does not support a CE determination. The Bridge is a contributing resource to the Ridge Valley Rural Historic District, and Tinicum Creek has received federal Wild and Scenic designation as well as state Exceptional Value designation. In addition, Consulting parties in the Section 106 process have demonstrated that any option other than rehabilitation will have significant impacts to these resources. A Level 2 Categorical Exclusion is clearly neither appropriate nor legal.

Respectfully,

A handwritten signature in blue ink that reads "Maya K. van Rossum". The signature is written in a cursive style with a long horizontal line extending to the right.

Maya K. van Rossum
the Delaware Riverkeeper