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9 September 2016

Maya K. van Rossum
Delaware Riverkeeper Network
925 Canal St., Suite 3701
Bristol, Pennsylvania 19007

In re: FERC DEIS for PennEast Pipeline Project

Dear Ms. van Rossum:

At your request, Dr. James Schmid and I have conducted a preliminary review of the Draft Environmental Impact Statement (DEIS) prepared by the Federal Energy Regulatory Commission (FERC) and released for public review and comment on 22 July 2016. The DEIS reviews the project proposed by PennEast Pipeline Company, LLC (PennEast) to construct, install, and operate approximately 115.1 miles of 36-inch diameter natural gas pipeline from Luzerne County, Pennsylvania to Mercer County, New Jersey. Our charge was to focus on potential impacts related to wetlands in the New Jersey section of the proposed project, inasmuch as we previously had provided a review of the Pennsylvania section¹.

Of the 115-mile total, 38 miles (33%) of the PennEast pipeline are proposed in two counties (Hunterdon and Mercer) in New Jersey. Also proposed in New Jersey are a 0.1-mile long, 12-inch-diameter pipe (Gilbert Lateral) in Holland Township, Hunterdon County, and a 1.5-mile long, 36-inch-diameter pipe (Lambertville Lateral) in West Amwell Township, Hunterdon County. Additional aboveground facilities include meter stations, mainline valves, pig launcher/receivers, as well as access roads.

Although we have not had the opportunity to thoroughly review and evaluate all of the background files, reports, and maps included in the submissions to FERC since September 2015, we have seen enough to have significant concerns about the accuracy and completeness of the information prepared by the applicant and used by FERC as the basis for the DEIS. Our concerns are discussed below.

¹ "The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania", prepared for the Delaware Riverkeeper Network by Schmid & Company, Inc., July 2016.
http://schmidco.com/PennEast_Wetland_Report_Final_July_2016.pdf

BACKGROUND

On 24 September 2015, PennEast filed an application with the FERC for a Certificate of Public Convenience and Necessity (Docket No. CP15-558-000). PennEast provided a Supplemental Information Filing (SIF) to FERC on 14 December 2015, another SIF on 22 February 2016, and provided additional information in response to various FERC comments on the application and Supplemental Information Filings. On 22 July 2016 FERC published a Draft Environmental Impact Statement (DEIS) for the project (FERC\EIS: 0271D), which is the primary subject of these comments.

On 8 February 2016, PennEast submitted an application to the Delaware River Basin Commission (DRBC) for a Surface Water Withdrawal and Discharge Permit. That application was supplemented on 1 April 2016. On 26 July 2016, PennEast submitted responses to DRBC's 23 May 2016 comments.

The New Jersey section of the pipeline also will require permits and approvals from the New Jersey Department of Environmental Protection (NJDEP), including a Letter of Interpretation (to establish the precise limits and classification of wetlands), Individual Freshwater Wetlands Permit, and Flood Hazard Area Verification and Individual Permit. NJDEP approvals would include the requisite Clean Water Act Section 401 Water Quality Certification allowing federal approval. As of 9 September 2016, no applications for any NJDEP wetland or flood hazard area permits had been submitted by PennEast (except for a Special Use approval to provide access to State lands for inventory purposes).

The US Army Corps of Engineers will need to provide Individual Permit approval per Section 10 of the Rivers and Harbors Act for work affecting traditional navigable waters of the United States.

On behalf of the Delaware Riverkeeper Network, Schmid & Company ecologists reviewed available PennEast project files regarding wetlands, waterways, and impact assessments for the New Jersey portion of the proposed pipeline. Our primary focus was on the DEIS published by FERC, and the consistency of the information therein with other publicly available files, including the FERC application and the application to the Delaware River Basin Commission. Of particular interest in our review are the highest quality streams and wetlands --- how accurately they have been identified and the extent to which impacts to them have been avoided or minimized.

MAJOR FINDINGS AND ISSUES

- The DEIS fails to inform the public as it is intended to. According to the DEIS Executive Summary (page ES-1):

The purpose of this environmental impact statement (EIS) **is to inform** FERC decisionmakers, **the public**, and the permitting agencies about the potential adverse and beneficial environmental impacts of the Project and its alternatives, and recommend mitigation measures that would reduce adverse impacts, to the extent practicable. [bold added]

The DEIS does not provide a complete set of PennEast pipeline project drawings that are required to illustrate mileposts, streams, wetlands, homes, roads, and other important features, plus proposed construction methods and activities in and near them. This makes it difficult for the public to evaluate the project and to follow FERC's discussions of potential impacts. FERC presumably received detailed drawings (for example, Erosion and Sedimentation Control Plans, or E&SCP) as part of the September 2015 PennEast application and/or Supplemental Information Filings. The Table of Contents of the DEIS cites the E&SCP as being in Appendix D, but that appendix simply includes a 120-page document entitled "*APPENDIX E: DRAFT Erosion and Sedimentation Control Plan, FERC Docket No. CP15-____-000*", to which is supposed to be attached (as Appendix E2) the Erosion & Sediment Pollution Control Plans, but all that actually is attached is a single page noting that the plans are "(NOT INCLUDED)".

- As noted above, details regarding the current route of the proposed PennEast Pipeline are not provided in the DEIS. There have been numerous and in some cases significant deviations from the original alignment. These presumably have been identified in the several Supplemental Information Filings and/or responses to FERC's preliminary comments. That detailed information, however, is not included alongside the 5 separate pdf files that comprise the DEIS itself, as made available on its website by FERC. A set of the current project drawings should have been provided to the public as an attachment to the DEIS. The same is true for all crucial supporting information such as detailed wetland delineation data logs, photos, etc.

E&SCP "Typicals" were provided (Appendix E3 of APPENDIX E, which is DEIS Appendix D), but they do not provide the specific details that are crucial to the public's understanding of what is proposed and where, and how construction, especially in environmentally sensitive areas, will be undertaken to minimize impacts.

- The FERC website providing the PennEast DEIS files should also provide links to relevant supporting information. It is exceedingly difficult and confusing to locate and identify the contents of the dozens (perhaps hundreds) of files that may be available somewhere on the wider FERC website that relate to the PennEast Pipeline project. In publishing the DEIS for public review and comment, FERC should first have required the applicant to assemble a complete indexed set of files, reports, and maps that describe and evaluate the current pipeline alignment. FERC then should have made those records publicly available as part of the DEIS. The public should not be required to sift through all of the pieces of ever-changing information and updates in order to try to understand the current project under review.

- Site-specific investigations of important resources at risk from the PennEast Pipeline project are largely incomplete. No proper EIS can be conducted when more than half of the project corridor has not been investigated for wetlands and other resources.

- The DEIS notes (page 4-66) that "field wetland delineations are incomplete". Indeed, 72% of the alignment in New Jersey (and 23% in Pennsylvania) has not yet been field investigated for wetlands and other water resources.

- Likewise, investigation is incomplete for vernal pools; per page 4-68 of the DEIS, as of April 2016, in Pennsylvania, survey work is 21% incomplete; in New Jersey, it is 74% incomplete.

- The same is true for threatened/endangered species of animals and plants and for cultural and archaeological resources. According to DEIS page 4-194, "*archaeological surveys have not been completed*", and (per DEIS page 4-198) "*PennEast has not completed all cultural resources field investigations, provided reports, or completed consultation for the Project.*" There are approximately 1,032 acres in Pennsylvania 2,441 acres in New Jersey that still require archaeological investigations. Investigations of above-ground historic resources also are incomplete.

- Because a complete set of detailed site plans for the current PennEast pipeline was not available in the DEIS itself, our analysis of wetlands largely relied on updated (as of May 2016) PennEast pipeline project drawings that were available from the DRBC website (Enclosure 15 from the DRBC application). Those drawings, entitled "Wetland Delineation Map - New Jersey" (scale 1 inch = 200 feet; dated 5/25/2016; 74 sheets), are based on recent aerial photographs and depict the 400-foot wide ROW, pipeline centerline with mileposts identified every 0.1 mile, shaded workspace areas within the ROW, streams, wetlands (either field-delineated or per desktop mapping), and soil map units. Also indicated are parcels where access was not granted to PennEast.

- The DRBC maps (and associated tables) appear to correspond well with the analysis of wetlands in the FERC DEIS. For example, DRBC Application Table 2C-2 lists all of the 104 wetlands crossed by the pipeline in New Jersey, and matches exactly the information in the DEIS Appendix G Table G-12. Unfortunately, the DEIS table does not include as much detail as the DRBC table; in particular the classification of New Jersey wetlands as "intermediate" or "exceptional" resource value (see below) is missing from the DEIS.

- The DRBC wetland maps reveal that some, but not all, of the undelineated/uninvestigated areas are where access was denied to the applicant (such areas are indicated on aerial site plan drawings with a red cross-hatch pattern). For example, from Milepost (MP) 92.0 to 92.6 on Wetland Sheet # 31 of 74, about half of the area is parcels where access was not granted (MP 92.25 to 92.6), and so the wetlands depicted in those areas are based on available desktop mapping rather than field investigation. In the other areas (MP 92.0 to MP 92.25; about 1,320 linear feet), however, where access apparently was not denied, and which the drawing notes is a "fully surveyed parcel", the wetland proposed to be crossed was not field surveyed but is based on non-regulatory NJDEP mapping. No explanation is given for why there is this obvious discrepancy in the type of wetland delineation performed at this location, or why site investigations have not been provided for all areas where access has been granted.

- Most of the wetland information (inventory and assessment) for the PennEast pipeline corridor discussed in the DEIS is based on available remote-sensing mapping, and not on field-based investigations. The maps used typically are non-regulatory wetland maps such as the National Wetlands Inventory (NWI) and/or the NJDEP Land Use Mapping, both of which were created from high-altitude aerial photointerpretation. Earlier project drawings, such as those submitted with the September 2015 FERC application, were based almost exclusively on NWI mapping, which typically understates significantly the extent of actual wetlands. Subsequent drawings (including those we reviewed from the DRBC application, dated May 2016) had incorporated additional wetlands as mapped by NJDEP in its 2012 Land Use Maps (although the legends of those PennEast drawings continue to incorrectly identify all such non-field-delineated wetlands as being "NWI").

- The DEIS notes (page 4-65) that where actual field investigation was not done, the PennEast mapping of wetlands within the 400-foot wide pipeline corridor used a combination of resources including aerial photography, NWI maps, hydric soils mapping from the Natural Resources Conservation Service (NRCS), and FEMA floodplain maps.

- We identified many instances where wetlands shown on project drawings appear to be significantly under-mapped, especially if all of the listed resources are considered. For example, near MP 92.3, there are extensive NRCS-mapped hydric soils both within and outside the wetlands as mapped by NJDEP, but the (undelineated) wetlands shown on the PennEast drawings identify as "wetlands" only what is shown on the NJDEP maps. In other places, where NWI-mapped wetlands extend beyond the NJDEP-mapped wetlands (sometimes significantly so -- hundreds of feet), only the NJDEP-mapped wetlands (and not the NWI wetlands) are shown on the project plan maps. In the absence of field-based investigation confirming any lesser extent, PennEast should identify the maximum possible extent of previously-mapped and potential wetlands. We saw no instance where NRCS-mapped hydric soils were used to extend wetlands in the pipeline ROW beyond what NWI or NJDEP wetland maps depicted as wetlands. Areas of NRCS-mapped hydric soils should receive careful scrutiny in the field.

- FERC notes (DEIS page 4-65) that wetlands are regulated at both federal and state levels, but then fails to mention or discuss the relevant state-level regulatory programs, which in some instances are more stringent than the federal wetland programs.

- Exceptional Value Wetlands in New Jersey have not been acknowledged in the DEIS.

- The DEIS (page 4-65) notes that PADEP classifies wetlands as "exceptional value" or "other", but it fails to note that NJDEP classifies wetlands as having "ordinary", "intermediate", or "exceptional" resource value. These three classifications in New Jersey are important not only for distinguishing the type of wetland, but also for establishing the size of State-regulated buffers (called "transition areas" by NJDEP) associated with them.

- According to N.J.A.C.-7:7A-2.4 (*Classification of freshwater wetlands by resource value*), a freshwater wetland of exceptional resource value meets one or more of the following criteria:

1. Discharges into FW1 or FW2 trout production waters or their tributaries;

2. Is a present habitat for threatened or endangered species; or
3. Is a documented habitat for threatened or endangered species, and which remains suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

- NJDEP Exceptional Resource Value Wetlands that are located along the PennEast Pipeline route are not identified on project drawings or in lists of wetlands or wetland impacts in the FERC DEIS. (Exceptional Value Wetlands are identified in tables in the DRBC files.) This is a major omission of the DEIS, because Exceptional Value Wetlands are considered by NJDEP to be the most ecologically important and sensitive type of wetlands in New Jersey, and as such are afforded a protective 150-foot wide regulated buffer.

- Major impacts are proposed by pipeline construction and operation in Exceptional Value Wetlands.

- Approximately half (51) of the 104 wetland impacts in New Jersey acknowledged to date by PennEast will involve Exceptional Value Wetlands (**Table 1**), although as noted above one would not know that from reading the DEIS (only by examining other files such as the DRBC application). Only 10 of those Exceptional Value Wetlands have been modified or affected in some way by past agricultural or other disturbances (and thus are assigned a wetland cover type by NJDEP of "ModAg", "MODL", or "MODR"). Most of the Exceptional Value Wetlands (80%) are categorized by NJDEP as natural PFO, PSS, or PEM wetlands.

- In all, PennEast currently acknowledges permanent impacts to 91 wetlands by converting woody wetland vegetation (typically PFO or PSS) to herbaceous vegetation (PEM), totaling 17.57 acres (**Table 2**). For Exceptional Value Wetlands, 45 permanent wetland conversions are proposed totaling 7.578 acres. Only 13 of the 45 crossings that will result in Exceptional Value Wetland conversions will be done by HDD or Bore methods. These are significant adverse impacts. For a more comprehensive discussion of the effects of converting wetlands from woody to herbaceous vegetation, please see our 2014 report prepared as part of a review of another pipeline project².

- Impacts to Exceptional Value Wetlands have not been minimized.

There are at least two common practices currently used by proponents of other pipeline projects to avoid or minimize impacts to important resources such as Exceptional Value Wetlands. Neither of these has been routinely proposed in the PennEast application. One is to simply route the pipeline around Exceptional Value Wetlands in order to avoid them. While rerouting to avoid wetlands is mentioned as a general consideration in the pipeline siting and alternatives analysis, specific areas where identified Exceptional Value Wetlands were avoided are nowhere identified or discussed.

² Schmid & Company, Inc. 2014. The effects of converting forest or scrub wetlands to herbaceous wetlands in Pennsylvania. Prepared for the Delaware Riverkeeper Network, Bristol PA. Media PA. 48 p.
http://www.schmidco.com/Leidy_Conversion_Final_Report.pdf

Horizontal Directional Drilling (HDD) or Conventional Boring are underground pipeline installation methods that can avoid or greatly minimize disturbances to sensitive resources on the ground surface by boring beneath them instead of using the traditional "open cut" trench method. HDD or Boring is proposed in only a few locations along the entire PennEast pipeline route. Of 104 proposed wetland impacts identified to date by PennEast (see Table 1), only 19 (18%) involve use of HDD or Bore methods. Of the 51 proposed impacts to Exceptional Value Wetlands, only one-quarter (13) involve use of HDD or Bore methods. Open cut trenches will be used to install pipelines through the remaining Exceptional Value Wetlands.

HDD crossings can be quite lengthy. One PennEast HDD crossing in New Jersey is to be 6,300 feet long (DEIS page 4-50). However, neither of the two longest wetland crossings (1,170 and 1,025 linear feet) are proposed to be done by HDD or Bore methods (neither of those involves an Exceptional Value Wetland). Of the 24 proposed crossings of Exceptional Value Wetlands that each will be longer than 100 linear feet, only 6 will be done by HDD or Bore methods (**Table 3**). Ten of those 24 crossings involve open cut installations through forested Exceptional Value Wetlands.

The FERC directive to minimize impacts has not been taken seriously.

- The functions and values of wetlands to be impacted, and particularly Exceptional Value Wetlands, have not been identified.

In accordance with NJAC 7:7A, NJDEP will not issue a freshwater wetland permit unless any loss of ecological value caused by a proposed wetland disturbance is fully compensated by replacing any freshwater wetland values and functions lost or disturbed with equal values and functions.

Measurement of wetland functions and values is not simple, and it has not been attempted here. The DEIS provides no evidence that the functions and values of each wetland proposed to be impacted have been determined or evaluated. Without an identification of the existing individual wetland functions, PennEast cannot adequately assess (and has not assessed) the effects of project activities on the wetlands, and particularly on the Exceptional Resource Value Wetlands. Furthermore, without an identification and assessment of individual wetland functions impacted by the proposed pipeline project, there can be no rational basis for determining the appropriateness of any proffered wetland mitigation to offset the wetland losses.

- According to the DEIS (page 4-71), additional temporary work spaces (ATWS) are being located at least 50 feet from wetlands per FERC guidelines; however, there are many Exceptional Value Wetlands located along or within the proposed pipeline ROW. Those wetlands have associated with them a NJDEP-imposed 150-foot wide buffer, so locating ATWS closer than 150 feet is unlikely to gain State approval.

- There are no FW1 (or PL) waters crossed by the proposed PennEast Pipeline, so there are no Tier 3 (Outstanding National Resource Waters) issues in NJ.

- Threatened/endangered species have not been adequately investigated.

The applicant and DEIS blithely claim that all suitable habitats for endangered species will be field surveyed at the proper season to the satisfaction of resource agencies. Based on the results of such future surveys, PennEast asserts that there will be no surface disturbance for its pipeline construction within 300 feet of any existing wetlands associated with endangered species or within 150 feet of any streams associated with endangered species (DEIS page 5-10). Yet the location of such areas has not yet been established, and no drawings showing the lack of surface disturbance around protected species habitats are provided. Moreover, the applicant's study corridor extended only 200 feet beyond the proposed pipeline. Thus protected species habitats within 300 feet from proposed disturbance have not been inventoried. Perhaps such information could be prepared subsequent to FERC approval and prior to construction, but none is currently available for public review or for consideration during FERC decisionmaking.

- The proposed plan for wetland mitigation is only conceptual.

A Preliminary wetland mitigation, riparian zone compensation, and construction-related disturbance restoration Plan for New Jersey was prepared during February 2016 as part of the FERC application. That document is frequently cited in the DEIS as the basis for the FERC staff conclusion that wetland impacts will not be significant. The Preliminary Plan provides some useful information concerning how the applicant will seek to devise a substantive plan for wetland mitigation in New Jersey. However, the Plan is completely lacking in the actual data that would be necessary for environmental assessment of any impacted wetland.

The Plan identifies the kinds of actions that PennEast intends to take during and after pipeline construction has caused surface disturbance to streams and wetlands. Given the lack of credible onsite inventory information, however, it is impossible for FERC to determine whether wetland and stream impacts have been adequately avoided or minimized when evaluating alternative proposed routes and deviations. The need for additional impact avoidance through route changes or underground installation of segments of this pipeline cannot be ascertained from the fragmentary project record included in the DEIS. The mitigation plan is now and will remain conceptual until the details regarding the number and type of wetland impacts have been determined.

RECOMMENDATIONS:

1) FERC should not complete the Final EIS until the entire project area (ROW alignment) has been investigated/delineated for wetlands, vernal pools, cultural resources, etc, at minimum where access has already been provided. Regarding wetlands, delineations must be field-inspected and confirmed by the Corps of Engineers (in PA) and the Department of Environmental Protection (in NJ).

2) FERC consistently recommends in the DEIS that construction not begin until surveys and investigations (for wetlands, cultural resources, endangered species, and other sensitive areas) be completed. However, FERC cannot make an informed determination that adverse impacts have been adequately avoided and minimized until all baseline inventories have been completed and evaluated.

- No FERC decision on final route segments should be made prior to resolution of cultural resources issues (to avoid problems similar to those currently associated with the Dakota Access Pipeline) and issues relating to threatened/endangered species.

- Similarly, the DEIS notes (page 2-6) that prior to construction PennEast proposes to survey all wetland boundaries and other environmentally sensitive areas. However, we recommend that those surveys be completed prior to FERC issuance of a Final EIS.

3) Most impacts to wetlands are downplayed as being temporary, minor, and insignificant because all affected wetlands are proposed to be returned "to preconstruction contours and hydrology", if not vegetation. Specific enforceable conditions must be inserted into any approval to assure that such will be the case.

- PennEast must provide evidence from previous pipeline construction projects which demonstrates that affected wetlands comparable to those found here were successfully returned to preconstruction conditions.

- FERC and other agencies must establish clear and specific guidelines, methods, and timeframes for monitoring the proposed restoration of all wetlands affected by the PennEast Pipeline to ensure that they are returned "to preconstruction contours and hydrology".

Finally, although the focus of this review has been on the New Jersey section of the PennEast Pipeline, we wish to offer two additional comments regarding the FERC DEIS and the Pennsylvania section of the PennEast Pipeline.

- In the discussion of existing wetland resources in Pennsylvania (DEIS pages 4-65 to 4-66) FERC makes several misstatements in its attempt to describe how "exceptional value wetlands" are defined. First, FERC incorrectly inserted the word "designated" in the wrong criterion. That word should *not* be used in terms of drinking water supplies --- there is no such thing as, nor do the Pa Code Chapter 105 regulations make reference to, "designated" drinking water supplies. As used at §105.17, the correct wording is "*Wetlands located along an existing public or private drinking water supply...*". The word "designated" should have been used in the next bulleted criterion regarding natural or wild areas, but there it is missing; the correct wording should be: "*Wetlands located in areas designated by the Department as "natural" or "wild" areas within State forest or park lands, wetlands located in areas designated as Federal wilderness areas...*" Finally, FERC uses the word "and" instead of "or" after the third of its four listed criteria, suggesting that all four must apply for a wetland to be considered an "exceptional value wetland" when in fact a wetland qualifies if any one of the criteria is met.

- We have identified properties and specific landowners in Pennsylvania where there are (confirmed), or where there are likely to be, springs or drinking water wells located

within 150 feet of the proposed pipeline construction workspace. Examples include: at MP 58.2 along E. Dannersville Road in Moore Township, Northampton County; at MP 57.8 along W. Beersville Road in Moore Township, Northampton County; near MP 53 along North Cottonwood Road in Danielsville, Northampton County; near MP 45.75 east of Beers Lane, Towamensing Township, Carbon County.

Thus, FERC's statement that "*there are no private water supply wells or springs located within 150 feet of the pipeline construction workspace in Pennsylvania*" (DEIS, page ES-5) is false. This is a problem in its own right, because there can be direct impacts to private water supplies if construction activities are not done carefully or if leaks occur during operation of the pipeline. In addition, the fact that there are private springs and wells used for water supply within 150 feet of the proposed ROW in Pennsylvania suggests that there very well may be additional Exceptional Value Wetlands not yet identified that meet the PADEP criterion at §105.17(1)(iv) regarding association with existing public or private water supplies.

We appreciate this opportunity to assist the Delaware Riverkeeper Network with our review. Please let us know if you have any questions about any of the above.

Sincerely yours,



Stephen P. Kunz
Senior Ecologist

AUTHORSHIP

This letter report was prepared by Stephen P. Kunz with the assistance of James A. Schmid. Both are senior ecologists with Schmid & Company, Inc. Mr. Kunz has worked full-time as a private sector ecological consultant since receiving a degree in human ecology from Rutgers University in 1977. Dr. Schmid is a biogeographer with more than 40 years of experience in ecological consulting. He received his BA from Columbia College and his MA and PhD from the University of Chicago. Both Mr. Kunz and Dr. Schmid are certified as *Senior Ecologists* by the Ecological Society of America and as *Professional Wetland Scientists* by the Society of Wetland Scientists.

Mr. Kunz and Dr. Schmid offer outstanding credentials as experts in ecology, wetlands, environmental regulation, and impact assessment. They have analyzed the environmental impacts of many kinds of proposed development activities in numerous states, including pipeline facilities, coal mining projects, industrial facilities, transportation facilities, commercial developments, and residential developments. They have written Environmental Impact Statements under contract to the US Environmental Protection Agency, Army Corps of Engineers, Interstate Commerce Commission, various agencies of State and local governments, and a diverse array of private sector entities. They also have commented on and prepared analyses of state and federal environmental regulations.

Additional information about Mr. Kunz and Dr. Schmid and their work over the past four decades can be found at www.schmidco.com.

TABLE 1. Wetlands crossed by the proposed pipeline in New Jersey, according to PennEast. All information is from FERC DEIS Table G-12, except classification of wetlands which is from DRBC Application Table 2C-2. Exceptional Value Wetlands classified as "EV" are identified in **boldface** type; all other wetlands in the ROW were identified by PennEast as being Intermediate Value Wetlands. Those EV Wetlands proposed to be crossed by HDD or Bore methods are noted in blue. Crossings of EV Wetlands that are longer than 100 linear feet are shown in red.

<u>Mile</u> <u>post</u>	<u>Wetland</u> <u>Type</u>	<u>Class.</u>	<u>Length</u>	<u>Crossing</u> <u>Method</u>
<u>Hunterdon County</u>				
77.7	PSS	EV	107	HDD
80.0	PFO	EV	133	Open Cut
80.7	MODag	EV	340	Open Cut
80.8	PEM	EV	86	Open Cut
81.6	PEM	EV	7	Bore
81.6	PEM	EV	4	Bore
82.3	PEM	EV	101	Bore
82.3	PSS	EV	195	Open Cut
82.3	PFO	EV	33	Open Cut
82.3	MODag	EV	156	Open Cut
82.7	PFO	EV	117	Open Cut
82.9	MODag	EV	114	Open Cut
83.9	PFO	EV	196	Open Cut
84.6	MODag		124	Open Cut
84.8	PFO		39	N/A
84.8	PSS		48	Open Cut
84.8	PSS		78	Open Cut
85.3	PFO	EV	1	N/A
85.3	PSS	EV	227	Open Cut
85.3	PEM	EV	79	Open Cut
86.3	PFO	EV	92	Open Cut
86.3	MODag	EV	107	Open Cut
85.9	PEM	EV	70	Open Cut
86.0	PFO	EV	96	Open Cut
86.7	PSS	EV	9	Open Cut
86.7	PSS	EV	47	Open Cut
87.2	PFO		78	Open Cut
87.4	PEM		18	Bore
87.9	PFO	EV	250	Open Cut
88.4	PFO	EV	85	Open Cut
88.4	PFO	EV	55	Open Cut
88.7	PFO		76	Bore
89.5	PFO		53	Open Cut
90.8	MODag		635	Open Cut

90.9	PSS		370	Open Cut
90.9	PFO		25	Open Cut
90.9	MODL		17	Open Cut
91.2	MODag		1,025	Open Cut
91.3	PFO		13	N/A
91.3	MODag		137	N/A
91.3	MODag		109	Open Cut
91.5	PFO	EV	207	HDD
91.5	PFO	EV	52	HDD
91.7	PFO	EV	85	HDD
91.9	MODag	EV	711	HDD
92.2	PFO	EV	500	HDD
92.3	PFO	EV	457	HDD
92.5	MODag	EV	123	N/A
92.7	MODag		50	Open Cut
93.2	PFO		199	Open Cut
93.2	PFO		307	Open Cut
93.3	PFO		1,170	Open Cut
93.5	MODR		271	Open Cut
93.8	MODR	EV	32	Open Cut
93.8	PFO	EV	332	Open Cut
94.3	PFO	EV	128	Open Cut
94.3	MODag	EV	550	Open Cut
94.6	PFO	EV	83	Open Cut
94.8	PEM	EV	68	N/A
94.8	PFO	EV	50	Open Cut
95.1	PFO	EV	0	Open Cut
95.1	PFO	EV	201	Open Cut
95.6	MODag	EV	31	Open Cut
97.3	PFO	EV	122	Open Cut
97.5	MODag		283	Open Cut
98.4	PFO		57	Bore
98.5	MODag		134	Bore
98.7	PFO	EV	176	Open Cut
98.7	MODR	EV	63	Open Cut
99.6	MODag		99	Open Cut
99.8	MODag		160	N/A
100.3	PFO		230	HDD
101.0	MODag		112	Open Cut
101.3	PEM		5	Open Cut
101.3	PSS		2	Open Cut
101.3	PEM		2	Open Cut
103.0	PFO		23	Open Cut
103.9	PFO		640	Open Cut
103.8	PEM		68	Open Cut

<u>Mile post</u>	<u>Wetland Type</u>	<u>Class.</u>	<u>Length</u>	<u>Crossing Method</u>
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Mercer County

104.9	PEM		49	Open Cut
105.3	PEM		3	Open Cut
105.3	PEM		22	Open Cut
105.4	PEM		207	Open Cut
105.4	PEM		33	Open Cut
105.6	PFO		74	HDD
105.9	PFO	EV	10	HDD
105.9	PFO	EV	61	HDD
107.4	PEM	EV	33	N/A
108.2	PFO	EV	243	Open Cut
108.6	PSS		583	Open Cut
109.1	PFO		98	Open Cut
109.1	PFO		62	Open Cut
109.5	PEM		36	Open Cut
110.2	PEM		132	Open Cut
112.5	PFO		27	Open Cut
112.5	PFO		325	Open Cut
112.8	PFO		93	N/A
112.8	PEM		21	Open Cut
112.8	PFO		137	Open Cut
112.8	PSS		235	Open Cut
112.8	MODag		24	Open Cut
112.9	PEM		531	Open Cut
113.4	PEM	EV	11	Bore
114.0	PEM	EV	58	Open Cut

Total # wetland crossings: 104

Total # EV wetland crossings: 51 (bold)

EV wetland crossings by HDD/Bore: 13 (in blue)

EV wetland crossings longer than 100 feet: 24 (in red)

EV wetland crossings > 100' by HDD/Bore: 6

Total distance of wetlands crossed: 16,443 feet 3.1 miles

Total distance EV wetlands crossed: 7,094 feet 1.3 miles

TABLE 2. Proposed permanent wetland conversions of PFO or PSS to PEM in New Jersey, including Exceptional Value Wetland conversions. Data provided by the applicant.

Wetland Type	Total # Permanent Wetland Conversions	Total Acres Permanent Wetland Conversions	Total # Permanent EV Wetland Conversions	Total Acres Permanent EV Wetland Conversions	Total # HDD or Bore EV Crossings
PFO	42	8.149	25	4.265	7
PSS	10	2.131	4	0.674	1
Other*	39	7.290	16	2.639	5
TOTAL	91	17.570	45	7.578	13

*Other = ModAg, ModL, ModR, and PEM

TABLE 3. Exceptional Value Wetland crossings of greater than 100 linear feet in New Jersey, by wetland type. This is a subset of the information presented in Table 1 and is intended to highlight some of the larger EV wetland crossings proposed; 100 feet is an arbitrary threshold. There are 24 such crossings currently proposed, only 6 of which are proposed to be done by HDD/Bore methods. Data from PennEast.

Milepost #	Wetland Type	Major EV Wetland Crossing - Length (>100 feet)	HDD or Bore Proposed Y/N?
77.7	PSS	107	Y
80.0	PFO	133	N
80.7	MODAg	340	N
82.3	PEM	101	Y
82.3	PSS	195	N
82.3	MODAg	156	N
82.7	PFO	117	N
82.9	MODAg	114	N
83.9	PFO	196	N
85.3	PSS	227	N
86.3	MODAg	107	N
87.9	PFO	250	N
91.5	PFO	207	Y
91.9	MODAg	711	Y
92.2	PFO	500	Y
92.3	PFO	457	Y
92.5	MODAg	123	N
93.8	PFO	332	N
94.3	PFO	128	N
94.3	MODAg	550	N
95.1	PFO	201	N
97.3	PFO	122	N
98.7	PFO	176	N
108.2	PFO	243	N