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Nathaniel J. Davis, Sr., Deputy Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Subject: Draft Environmental Impact Statement (DEIS) for the Proposed PennEast Pipeline Project (Pennsylvania, New Jersey) (FERC Docket No. CP15-558-000)

On September 12, the National Park Service submitted comments to the Draft Environmental Impact Statement (DEIS) for the Proposed PennEast Pipeline Project by the PennEast Pipeline Company, LLC; FERC No. CP15-558-000. The Department of the Interior is now providing additional comment on various technical details of the DEIS provided by the expertise of the US Geological Survey, as well as potential impacts to USGS water quality and quantity monitoring activities. We request your consideration of the following comments.

COMMENTS

COMMENT 1: Arsenic exceedance in wells
Under "Geology" (page 4-11): Percentages of arsenic exceedance by municipality are presented, along with concentrations in some individual wells. Findings on the influence of geochemical conditions and well depth on arsenic concentration in local geologic formations is briefly discussed. However, there are no references for this critical component. Without a source, there is no way to independently verify these data or findings.

COMMENT 2: Well sampling plan for arsenic
Under "Geology" (page 4-12): A "*pre*" and "*post*" construction well testing plan is mentioned for arsenic in "*potentially affected wells"*, the stated purpose of which is *"to identify if arsenic concentrations have increased above pre-construction (background) concentrations"*. We do not find an explanation in the DEIS on which, how many, or what groundwater constituents wells would be sampled for. For example, the DEIS states that sampling would occur "*in wells adjacent to construction work areas*". Some of the basic elements commonly required in a groundwater sampling plan include: constituents to be analyzed for; a list of targeted wells; sampling methods; analytical methods; contracted labs; time periods; and quality control measures. We recommend a comprehensive sampling plan be provided, either in the text, or

stand-alone in an appendix. Along with the elements specified above, we recommend the following elements and question resolutions:

1. Clearly define the set of "*Potentially affected wells*" in advance of construction.
2. How will "background concentrations" be defined in any individual well (i.e., by a single "pre" construction sample?)? Gross and Low (2013) defined the "elevated" concentration of arsenic in Pennsylvania groundwater at 4 micrograms per liter (μg/L).
3. How much increase in arsenic concentration (above a defined background concentration) will be considered elevated and attributable to pipeline construction?
4. When will "post" construction sampling occur?
5. Will samples be of "raw" or "treated" water (where treatment exists)?
6. Will well casing/bore water be evacuated prior to sampling? Standard USGS protocol is to evacuate a minimum of 3 casing volumes to ensure the collection of a representative sample of groundwater.
7. Which arsenic species will be analyzed for?
8. Will collected samples be whole water, filtered, or both?
9. What well types will be sampled?

COMMENT 3: Arsenic mobilization
Under "Geology" (p 4-12): The text discusses potential for arsenic mobilization as a result of construction activities. PennEast initiated a leachability evaluation of rock samples by Serfes in 2016. Based upon this one study, the following conclusion in the text states: "*there should be no detectible risks from arsenic mobilization in groundwater due to Project construction"*. This study is not part of the DEIS, is not made available online, and is not available thru commonly used scientific literature search sites, or with a "Google" search. Without access to the study, the stated conclusions cannot be independently verified.

A brief literature search shows recent published studies with USGS authors that demonstrate potential for arsenic mobilization in northern New Jersey waterways from disturbance of bottom sediments. Barringer and others (2011) showed that elevated concentrations of arsenic occurred during warm months from the outlet of Lake Mohawk in Northwestern New Jersey, and that the source was primarily reduced arsenic diffusing from bottom sediments. Mumford and others (2014) studied arsenic in Six-mile run and Pike run, streams in the same New Jersey Piedmont Province as the proposed PennEast Pipeline. Results at Six-mile run showed arsenic in low oxygen streambed-sediment pore water at concentrations more than five times the New Jersey drinking water standard (5 μg/L). Romanok and others (2006) showed detectable arsenic concentrations in 100% of streambed sediment samples collected in the Delaware River Basin, exceeding the Threshold Effects Concentrations (TEC) of the Sediment Quality Guidelines (SQG) at 47% of the sites.

On page ES-7, the following statement: "*the conventional bore and HDD crossing method would involve installing the pipeline segment beneath the waterbody which would prevent disturbance of bottom sediments and avoid altering the flow of water within the waterbody"*. These methods are to be used beneath both streams and wetlands. In the proposed area, streams and wetlands are discharge areas, where a significant component of groundwater flows upward

and discharges through bottom sediments. Barringer and others (2014) showed the relationship of arsenic is streambed sediments to shallow groundwater discharging to streams. Disturbance in the shallow groundwater beneath a stream or wetland may mobilize arsenic and increase concentrations discharging to waterbodies directly above. The DEIS also states the dry-ditch method will be employed to cross some waterbodies, and that 56 acres of wetlands will be impacted (Page ES-6); 35 of the acres permanently. Arsenic is a primary contaminant of concern, and the potential for downstream concentration increases due to all construction related disturbances should be directly addressed in the DEIS.

COMMENT 4: Confusing/contradicting statements on Arsenic in groundwater
On Page 4-12, the following statement is made: "*Therefore, there should be no detectible risks from arsenic mobilization in groundwater due to Project construction. The study demonstrates that background concentrations would return within a short time after the pipeline is completed and no mobilization would continue during operation".*

On page 4-280, the following statement is made: "*There is a possibility that the proposed Project, together with others such as the recently completed Northeast Supply Link Project's Stanton Loop, could result in additional arsenic exposure to groundwater in the Hunterdon County area".*

We do not understand the first statement on page 4-12: If there is "no detectible risk" due to project construction, then to what level(s) would background concentrations return? And approximately how long is a short time? The second statement on page 4-280 (further in the DEIS) also appears to contradict the first statement.

COMMENT 5: Arsenic drinking water standards in Pennsylvania and New Jersey
On Page 4-12, the following statement is made: *"In the unlikely event that construction of the Project causes an increase in arsenic above safe drinking water levels, PennEast would provide a treatment system to remove arsenic from the drinking water at individual properties or, provide an alternative water source."*
The drinking water standard for arsenic is 10 μg/l in Pennsylvania and 5 μg/l in New Jersey. We recommend that the DEIS clarify that different standards will be applied in the different states, or use the lower New Jersey standard as the common interstate arsenic standard for the entire pipeline project.

COMMENT 6: USGS gaging stations
The USGS operates gaging stations along streams throughout the US to collect water quantity and quality data for a variety of purposes. Continuous operation of USGS gages is essential for our stakeholders. These gaging stations have permanent infrastructure and are vulnerable to disruption when nearby construction (such as pipeline installation) occurs in the vicinity of these stations. Several USGS stations are near the proposed PennEast pipeline, based on visual comparisons of the described route and USGS gage locations. Specifics about the gages are shown below. Exact distances between the pipeline and these USGS sites needs to be determined. If the distance is close enough as to potentially cause disruption to USGS site activities, the draft EIS needs to be amended to state what precautions will be taken to ensure the USGS sites are not affected. USGS needs to see detailed descriptions of proposed remedies to

evaluate impacts to these services where this disruption is not preventable. The USGS stations closest to the proposed pipeline locations are:

1. USGS 01447500 Lehigh River at Stoddartsville, PA

DESCRIPTION: Latitude 41°07'49", Longitude 75°37'33" NAD27, Monroe County, Pennsylvania, Hydrologic Unit 02040106

2. USGS 01447720 Tobyhanna Creek near Blakeslee, PA

DESCRIPTION: Latitude 41°05'05", Longitude 75°36'21" NAD27, Carbon County, Pennsylvania, Hydrologic Unit 02040106

3. USGS 01449375 Wild Cr ab Penn Forest Reservoir near Kresgeville PA

DESCRIPTION: Latitude 40°56'24.5", Longitude 75°35'04.06" NAD83, Carbon County, Pennsylvania, Hydrologic Unit 02040106

4. USGS 01449360 Pohopoco Creek at Kresgeville, PA

DESCRIPTION: Latitude 40°53'51", Longitude 75°30'10" NAD27, Monroe County, Pennsylvania, Hydrologic Unit 02040106

5. USGS 01457400 Musconetcong River at Riegelsville NJ

DESCRIPTION: Latitude 40°35'33", Longitude 75°11'10" NAD83, Warren County, New Jersey, Hydrologic Unit 02040105

6. USGS 01461500 Delaware River at Stockton NJ

DESCRIPTION: Latitude 40°24'10", Longitude 74°58'46" NAD83, Hunterdon County, New Jersey, Hydrologic Unit 02040105

7. USGS 01461300 Wickecheoke Creek at Stockton NJ

DESCRIPTION: Latitude 40°24'41", Longitude 74°59'12" NAD83, Hunterdon County, New Jersey, Hydrologic Unit 02040105

8. USGS 01462000 Delaware River at Lambertville NJ

DESCRIPTION: Latitude 40°21'53", Longitude 74°56'56" NAD83, Hunterdon County, New Jersey, Hydrologic Unit 02040105

9. USGS 01462197 Moore C tributary at Valley Road near Lambertville NJ

DESCRIPTION: Latitude 40°20'14", Longitude 74°54'57" NAD83, Mercer County, New Jersey, Hydrologic Unit 02040105

COMMENT 7: Incorrect aquifer description

The following paragraph is on Page 4-30 (Water Resources): *"In general, the coastal plain aquifer system is characterized by a series of hydrologic units of varying thickness, lateral extent, and water bearing characteristics largely composed of unconsolidated sediments occurring in a subsurface wedge beneath land surface (NJDEP 1985). The Coastal Plain Sole Source Aquifer would be crossed at three locations by the mainline: between MP 77.6 and MP 90.5, MP 90.7 and MP 90.8, and MP 96.54 and MP 108. It would also be crossed by the Gilbert Lateral between MP 0.0 and MP 0.13 and the Lambertville Lateral between MP 0.0 and MP 0.72."*

It is factually correct that the pipeline crosses upstream portions of the Delaware River watershed (the stream-flow source zone) designated as part of the Coastal Plain sole source aquifer. However, it does not at any point overlie coastal plain hydrologic units, which the above paragraph implies. The pipeline route in New Jersey overlies Fractured-rock aquifers of the Newark Basin part of the Piedmont province. We recommend clarifying this difference in the text.

COMMENT 8: Inadequate USGS quadrangle map references.
The DEIS appendix "B" uses USGS topographic maps to create a seamless base-map illustrating the pipeline route over 32 contiguous figures. Map referencing information provided is limited to the text "USGS QUADRANGLE MAP" along with "1:24,000" scale at the bottom of each individual figure (pages 475-506). The map referencing information is inadequate, and at a minimum, should have the USGS map name, map series, map-scale, and the "Revised/Inspected" Date. For example, the northwestern terminus of the pipeline in Dallas Township, PA is actually located on the USGS "Kingston" quadrangle, 7.5 minute series, photo-revised in 1983. Currently, there is no way to relate USGS quadrangle maps to DEIS figures using them as base-maps.

A figure titled "USGS QUADRANGLE MAP INDEX" on page 474 shows the entire proposed pipeline route overlain with reference rectangles. This is misleading, as most readers would likely interpret the rectangles as representing USGS quad map boundaries. The DEIS index rectangles correlate with DEIS figures, not USGS quad boundaries. If this format is retained, the following should be added: 1) background-shaded USGS quad boundaries to the Index map; 2) a quad "Keycode" within each USGS quadrangle boundary; and 3) A table relating adequate reference information by "Keycode" to each USGS quad on the index map.

Suggested References:

Barringer JL, Haussmann N, Sutley SJ, Sanzolone RF, Garbarino JR, Johnson AH, et al. Contributions of arsenic from bed sediments to water in the Wallkill River, Northwestern New Jersey, USA. Geol Soc Am annual meeting and exposition Philadelphia PA 22–25 October 2006 Abstracts with Programs; 2006. p. 150–1.

Barringer JL, Szabo Z, Wilson TP, Bonin JL, Kratzer T, Cenno K, Romagna T, Alebus M, Hirst B. Distribution and seasonal dynamics of arsenic in a shallow lake in northwestern New Jersey, USA. Environ Geochem Health (2011) 33:1-22

Barringer, J.L., Reilly, P.A., Eberl, D.D., Mumford, A.C., Benzel, W.M., Szabo, Zoltan, Shourds, J.L., and Young, L.Y., 2014, Arsenic in New Jersey Coastal Plain streams, sediments, and shallow groundwater: Effects from different geologic sources and anthropogenic inputs on biogeochemical and physical mobilization processes: U.S. Geological Survey Scientific Investigations Report 2013–5107, 38 p., http://dx.doi.org/10.3133/sir20135107.

Mumford AC, Barringer JL, Reilly PA, Eberl DD, Blum AE, Young LY. Biogeochemical environments of streambed-sediment pore waters with and without arsenic enrichment in a sedimentary rock terrain, New Jersey Piedmont, USA, Sci Total Environ (2014), http://dx.doi.org/10.1016/jscitotenv.2014.07.104

Gross, E.L., Low, D.J., 2013, Arsenic concentrations, related environmental factors, and the predicted probability of elevated arsenic in groundwater in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2012–5257, 46 p.

Romanok, Kristin, Fischer, J.M., Riva-Murray, Karen, Brightbill, Robin, and Bilger, Michael, 2006, Organic Compounds and Trace Elements in Fish Tissue and Bed Sediment in the Delaware River Basin, New Jersey, Pennsylvania, New York, and Delaware, 1998-2000: U.S. Geological Survey Scientific Investigations Report 2006-5150, 69 p.

*References listed are either USGS publications or have USGS personnel as authors.

Thank you for the opportunity to review and comment on the DEIS. If you have any questions concerning our comments, please contact Mike Norris, USGS Coordinator for Environmental Document Reviews, at (603) 226-7847 or at mnorris@usgs.gov.

Sincerely,

Lindy Nelson
Regional Environmental Officer