SOURLAND CONSERVANCY COMMENTS ON PROPOSED PENNEAST PIPELINE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

Section 4.9

Section 4.9.1.1 New Jersey

It is not clear that the New Jersey State Historic Preservation Officer (SHPO) has accepted the recommendation to include the Ramapough Lenape Indian nation as a consulting party in the Section 106 process. It is necessary that the Ramapough Lenape nation participate in the process in order to ensure adequate input and participation from the tribe, who has the most direct and reliable knowledge about the tribal archeological resources in the region.

According to the Holland Township Natural Resources Inventory, Draft July 2006,

> "Humans arrived in New Jersey at least 9,000 - 10,000 years ago (Ashley, 2004). In nearby Kingwood Township, an archeological study found more than 3,000 Native American artifacts from the *Paleo-Indian Period*, many dating back to 841 BC or earlier, including ceramics, stone tools and food remains (Burrow et al, 1999 in Frenchtowner.com, 2006). At the time the first Europeans arrived in the area, there may have been as few as 2,000 or as many as 12,000 humans living in what is now New Jersey (compared to 5,124 now living in Holland Township and 8.7 million in New Jersey, according to the 2000 Census). These Indians belonged to the Lenape tribe." (Page 134).

In the Sourlands, Native American habitation was similar – the Lenape nation settled the area and farmed the valleys at the foot of the mountain and hunted and fished the mountain region. The route for the PennEast pipeline through the Sourlands penetrates the areas used by these very early inhabitants. According to the Smart Growth Planning and Management Project for the Sourland Mountain, Conservation and Open Space Plan, November, 2005,

> "The Lenape were among the first inhabitants of the region, from 1000 AD to 1650 AD. The Lenape were primarily a farming culture, taking advantage of the rich valley areas for the majority of their food production. The Lenape also used the more mountainous areas for hunting and fishing, but the primary areas of habitation were in the valleys adjacent to the Sourland plateau." (Page 17).

The archeological survey is not complete, according to the DEIS, and it is not clear if the requirements of the NJ SHPO have been met regarding the sensitivity of the site-specific assessment of the resource eligibility for listing in the NJ Register of Historic places and NRHP and the relationship between reported landscape features and aboveground historic properties have been met. Until the archeological survey is

completed and the New Jersey SHPO concerns fully addressed, the applicant should not be allowed to proceed and the EIS should not be considered complete. This is especially important because the model showed the area to be rich in resources yet the field surveys reported few precontact archeological resources, a contradiction that must be resolved.

The Sourland Region is rich in historic resources and important early American history. As per the Smart Growth Planning and Management Project for the Sourland Mountain, Conservation and Open Space Plan for the Sourland Mountain Region, November, 2005,

> "The Revolutionary War brought a great deal of activity to the region. From the earliest days of recruitment for those to fight for patriot causes to strongholds and hideouts throughout the mountain, the Sourlands has been prominent in the storytelling of the Revolutionary War. The Crossroads of the American Revolution Project highlights the historical significance of the Sourland Mountain region, and sites like Hart's Cave, where John Hart, a signer of the Declaration of Independence, hid from the British. The Sourlands location made it an ideal route not only for patriots but for large scale marches, such as Washington's march to the Battle of Monmouth in June 1778 (see Figure 4: Historic Sites and Trails). The region also made an interesting vantage point to monitor the advance of the British and housed a fire signaling system that used large fire pits that spanned from Northern New Jersey to Trenton to Monmouth County. The role of the region in the Revolutionary War is rather extensive, and is detailed in a number of books or by contacting local historical societies and municipalities. Settlement on the Sourland Mountain began as early as 1725 when the first parcels of land were divided and sold to permanent settlers. By the time of the Revolutionary War much of the outskirts of the Sourland Mountain were dotted with villages providing a wealth of services. The historic villages and habitats of the region are described in Appendix 1, which provides a glimpse into the history of how the region was developed. Figure 5: Historic Sites and Districts, depicts historic sites and districts as represented on the NJDEP database for the State and National Register. These various sites and districts call attention to the historic significance of the region's human development and help to retain the significant cultural characteristics of the region." (Page 17 and Figures 4 and 5)

The Sourland Region is also rich in the history of African Americans. The applicant should be required to research the potential for African American history and burial grounds in the area to be affected by the pipeline. Important undiscovered artifacts and burial grounds could be disturbed or destroyed unless thorough survey and research is done and research should be done with the participation of the local African American community. The Stoutsburg Cemetery Association was formed in recent years to

protect this African American cemetery in the Sourlands. There is currently a book being written about the history of African Americans in the Sourland Mountain and central New Jersey region by two women who founded the Stoutsburg Cemetery Association. A recent article in the Philadelphia Daily News previews the book, "Unraveling the Secrets of Stoutsburg Cemetery, an African-American burial ground in New Jersey", A.D. Amorosi, the Daily News, February 18, 2016:

> "Stoutsburg Cemetery - in Skillman, N.J., at the heel of the Sourland Mountains - has long served as an African American burial ground. Like many such places, it holds much unspoken history. Two trustees of the Stoutsburg Cemetery Association are unraveling those secrets - the stories behind unmarked slave graves around the cemetery - for a book to be published next year.
>
> Purchased in 1858 for people of color, Stoutsburg became the final resting place for local residents, including veterans of conflicts dating to the American Revolution. They came from Hopewell, Pennington, Princeton, Lambertville, and other towns - where many of their descendants live today.
>
> The burial ground was a little-known and endangered piece of history. In 2006, Elaine Buck and Beverly Mills, cemetery trustees and descendants of men buried at Stoutsburg, swung into action. Buck got a call telling her that a neighboring landowner was going to pave a driveway over land that might well belong to the burial ground."
>
> "Not only did they want to protect the unmarked burial sites at the edge of the cemetery, they also wanted to know about the stories, those of former slaves and sharecroppers. Buck says they want to 'trace lineages from colonial times to the Hopewell Township' of today.
>
> They also wanted to trace their own roots. 'We were never taught in school that there were slaves in New Jersey,' says Mills. 'The fact that we are descendants of some of those slaves makes everything more personal.' Then they wanted to make certain that this truth - that the Garden State was one of the last Northern states to abolish slavery - was recorded."
>
> http://articles.philly.com/2016-02-18/news/70701857_1_burial-ground-descendants-slave

The Stoutsburg Cemetery Association is also forming a non-profit corporation with the Sourland Conservancy to form the Stoutsburg Sourland African American Museum, a unique and historically important museum in a local church that has been recently preserved on Sourland Mountain by these groups. Both of these organizations - the Stoutsburg Cemetery Association and the Stoutsburg Sourland African American

Museum - should be consulted and should be invited to participate as consulting parties in the FERC process.

Section 4.9.1.2 National Park Service

The Lower Delaware Wild and Scenic River includes portions of the Sourland Mountain region. The Lower Delaware River Management Plan catalogs and describes the extensive historic, cultural, scenic and natural resources that are to be protected under the Act's designation of this region. The "Lower Delaware National Wild and Scenic River Study", National Wild and Scenic River System".

The Plan states as its first goal regarding water quality:

> "Maintain existing water quality in the Delaware River and its tributaries from measurably degrading and improve it where practical."

The policies that they adopted to carry out this goal are:

> "• Achieve the highest practical state and federal water quality designation for the river and its tributaries.
>
> • Manage point discharge and storm water non-point runoff to minimize degradation of the river.
>
> • Encourage the use of Best Management Practices in the agricultural areas within the river corridor to minimize water quality degradation from storm water runoff,
>
> • Encourage the use of Best Management Practices for activities other than agricultural that could result in water quality degradation from storm water runoff.
>
> • Discourage inappropriate development in floodplains, wetlands, steep slopes and buffer strips along the Lower Delaware River and its tributaries."

The Plan states as its second goal regarding natural resources:

> "Preserve and protect the river's outstanding natural resources, including rare and endangered plant and animal species, river islands, steep slopes and buffer areas in the river corridor and along the tributaries."

The policies that they adopted to carry out this goal are:

> "• Promote stream corridor preservation, as well as protection of steep slopes, floodplains and wetlands.

• Encourage the protection of river corridor resources while allowing property owners to utilize their land in ways that do not harm those valuable resources.

• Encourage the protection of significant natural resources in the corridor, including rare and endangered plant and animal species and significant wildlife habitats."

It is not clear from the DEIS that the resources that are to be protected by the Wild and Scenic River designation have been identified and plans made to avoid diminishing the water quality and outstanding values of these resources. The watershed lands that drain from the Sourlands to the Lower Delaware River, as shown by the boundary map attached (Attachment 1) impact the main stem Delaware River through overland stormwater flows and through the interconnection of ground and surface waters. The tributaries that flow to the Lower Delaware River from the Sourlands, directly contribute surface water and transfer groundwater flows through the base flow of these streams. The Delaware and Raritan Canal receives flows in some locations from the tributaries and transfers these flows to the River at specific locations along the canal or during overflow. There are also ponds and lakes in the contributing watershed landscape that are connected hydrologically to the River.

These interconnections of the watershed lands, tributaries, and surface water bodies to the Lower Delaware Wild and Scenic River impact the water quality, the quantitative flows, and the rate of flow and temperature of the river. This in turn affects fish, wildlife, vegetative cover, and other natural assets and also can impact the cultural and historic resources, especially through flooding and flood damages that can occur if storm flows increase as a result of upland or riparian disturbance caused by the pipeline.

The applicant for the proposed PennEast pipeline should be required to further investigate the myriad resources in the Study and Plan and develop means to avoid degradation, as required by the Lower Delaware River Management Plan.

Section 4.9.1.2 Results of Surveys

The surveys are incomplete, as stated in the DEIS. The DEIS was not ready to be issued due to the lack of information in the document on most resources that require assessment. No action should be taken regarding the PennEast project based on the incomplete information from surveys except to put the project on hold.

Section 4.9.2.2 New Jersey

Archeological Resources and Aboveground Resources are not adequately surveyed or assessed. It is stated that archeological surveys of the Project APE in New Jersey, where the Sourlands are located, have not been completed. Many survey reports,

avoidance plans, evaluation studies and reports and potential treatment plans are missing, making the DEIS incomplete and unacceptable. The Sourlands Region PennEast Pipeline Parcel Analysis shows the parcels within the Sourlands in the Project APE. (Attachment 1). There is simply not enough information about the resources listed in the Lower Delaware River Management Plan, the Pleasant Valley District, the James Lambert House and other Lambertville resources, and other historic farms, locations, and resources to assess the potential impacts of the Project. How will the applicant complete an analysis of all archeological and aboveground resources within the affected area and plan for avoidance without the required surveys?

Section 4.9.3 Outstanding Cultural Resource Investigations

The DEIS states that in New Jersey, the Hunterdon and Mercer County area not surveyed total 2,440.6 acres. How will the applicant complete an analysis of all archeological and aboveground resources within the affected area and plan for avoidance without the required surveys?

Section 4.9.4 and 4.9.5 Unanticipated Discoveries Procedures and General Impact and Mitigation

There are extenuating factors that make it likely that unanticipated discoveries will occur. The lack of information due to the missing surveys of the Estimated Area to be impacted will likely persist into the future, making it difficult if not impossible to gather needed information for all resources. Also, adverse effects from construction practices have the potential in hard rock geology to travel further than anticipated.

Drilling and blasting required by the Project will likely encounter rock that is hard to penetrate. The Sourland region is in the Piedmont Province and geologic formations are described in the Smart Growth Planning and Management Project for the Sourland Mountain, Conservation and Open Space Plan, November, 2005:

> "The Sourland Mountain consists of bedrock formations which are severely limited in their ability to produce clean water. These bedrock formations were deposited in a series of basins during the Triassic and Jurassic Ages, when violent volcanic activity shaped the Sourlands landscape. The sedimentary deposits of the Stockton, Passaic and Lockatong formations formed broad alluvial plains, which were reshaped when volcanic activity baked the sedimentary layers of shale and sandstone and erupted through the surface, forming the Diabase core of the Mountain. These geomorphologic changes created dense hard rocks, with very low water bearing capacities, and heated the adjoining shales and sandstones, significantly reducing their value as groundwater sources." (Page 27)

Rock that was impossible to drill using HDD was encountered recently when the Transcontinental Gas Pipe Line Company's Leidy Southeast Expansion Project Docket, Skillman Loop natural gas pipeline attempted to use Horizontal Directional Drilling (HDD) to drill under a stream in similar geology that will be encountered on Baldpate Mountain and Belle Mountain, which are part of the Sourlands. After drilling failed, pounding was used and the result was unbearable noise and vibrations for surrounding residents. In a September 1, 2016 Notice from the Mayor Patricia Graham of Montgomery Township, Somerset County, NJ to residents on the Township's website, the unacceptable efforts at stream crossing and other construction activities were described:

> "Ms. Graham's letter also criticized Transco's work and noted that the project has "caused significant disruption of traffic patterns, and residents' lives and has taxed Township resources." The Township also requested that the project be expedited and that the Township's prior requests for local monitoring and control of the project be granted to address environmental and other concerns with the proposed work. The final portion of the pipeline loop traverses an environmentally sensitive area and land that Montgomery has preserved as open space. Among other things, the Township has sought to require Transco to deposit funds in escrow to be used to pay an environmental expert retained by the Township for monitoring purposes." (Township of Montgomery website, 9.1.2016)

As stated in a letter from the Sourland Alliance to NJDEP, the HDD drilling problem arose as an unexpected and unplanned failure due to TRANSCO not completing a comprehensive geologic analysis as is usually required by regulation but was apparently waived for Transco. (Letter dated 2.3.16 from Sourland Alliance to NJDEP, Attachment 2) An alternatives analysis that considered the findings of a site specific comprehensive geologic analysis may have proven that avoiding damage to local streams and local geologic conditions on Princeton Ridge was impossible and ruled out the Loop's crossing of the Ridge. The result is the project has been on hold for months and this portion of the Loop may never be completed.

It is reasonable that adverse effects beyond those planned for will occur in the similar geologic conditions of Baldpate Mountain and other areas in the Sourlands, as well as outside the Sourlands in the Project APE. The streams all require HDD to avoid stream impacts that will permanently damage the streams, the riparian corridor's natural conditions and the water quality of flows delivered to the Delaware and Raritan Canal and the Delaware River. Yet due to the hard rock that could be encountered, to drill or pound under these streams may, like the stream crossing in Montgomery Township, make the stream crossings impossible. It could also substantially expand the impacts – such as vibrations and disturbance of local wells and septic systems, to the local quarry

in West Amwell Township, and other sensitive features - from these construction activities to areas outside of the usual impact area.

A comprehensive geologic analysis must be done of the entire region where streams are located in hard rock geology in the Project APE. The planning for vibration and blasting that is “recommended” in the DEIS should be expanded to include a larger region and a comprehensive geologic analysis of the stream and wetland areas, and must include plans for abandonment of the crossing of streams if the rock encountered is too hard to drill through.

Section 4.9.6 Compliance with NHPA

Since compliance with NHPA has not been met and FERC has stated that no construction can begin, the Sourland Conservancy requests that it be made clear that the prohibition of staging includes the cutting of trees and other vegetation, the grading of land, and any other land changes that would disturb existing conditions.

Section 4.10 Air Quality and Noise

Section 10.1 Air Quality

All air quality impacts must include upstream and midstream impacts from natural gas extraction, processing, movement by connecting pipelines and associated infrastructure as well as the impacts from the PennEast project. This includes the full life cycle emissions of air pollutants and greenhouse gases from natural gas that will be moved through the Project system such as volatile organic compounds, particulates, nitrogen oxides, sulfur dioxide, methane and carbon. The PennEast pipeline project will rely on the development of sources of natural gas from gas wells and a system of operations that will be essential for the product the pipeline will deliver.

These emissions occur uncontrollably during each stage of natural gas development and must be considered as part of the environmental impact of the proposed PennEast project. Sources of the emissions include diesel powered equipment and vehicles, condensate tanks, frack fluid and wastewater basins that service gas well sites, natural gas gathering lines, compressor stations, gas line heaters, storage facilities, and other interconnection and processing operations.

> “Shale gas operations release a variety of pollutants that can degrade local air quality, including nitrogen oxides (NO_x); sulfur oxides (SO_x); particulate matter (PM); and volatile organic compounds (VOCs), such as formaldehyde, benzene, toluene, ethylbenzene, and xylene (BTEX). NO_x, SO_x, and PM are subject to national ambient air-quality standards, (NAAQS) due to their potential to cause harm to human health and the environment . Furthermore, NO_x and VOCs are

the precursors to ozone, the primary component in smog, which can cause respiratory illness." ("The Potential Environmental Impacts of Fracking in the Delaware River Basin", Steven Habicht, Lars Hanson and Paul Faeth, August 2015, page 53.)

The Transco interconnects that would connect to the proposed PennEast pipeline already contribute polluting air emissions to the Sourland region and the New Jersey area. The additional pollution load must be considered cumulatively with other current emissions when calculating the magnitude of air emissions to the region.

Recent studies and peer-reviewed reports have added to the body of scientific documentation of the impacts of natural gas development on air quality.

Gas well stimulations impacts. Brandt, A., Millstein, D., Jin, L., & Englander, J. (2015, July 9). Retrieved from http://ccst.us/publications/2015/vol-II-chapter-3.pdf

Chemicals that cause cancer released many times higher into the air by fracking. Hasemyer, D. (2015, May 20). Retrieved from http://insideclimatenews.org/news/19052015/heavily-fracked-ohio-county-unsafe-levels-toxic-air-pollutants-fracking-natural-gas-drilling

Gas well emissions travel far downwind. Levine, F. & Tune, L. (2015, April 30). Retrieved from http://www.umdrightnow.umd.edu/news/emissions-natural-gas-wells-may-travel-far-downwind

Carcinogenic hydrocarbons pollute air near fracking sites. Lockwood, D. (2015, April 8). Retrieved from http://cen.acs.org/articles/93/web/2015/04/Fracking-Activities-Pollute-Nearby-Air.html

Local impacts of air emissions from natural gas operations. Colborn, Theo, Kim Schultz, Lucille Herrick, and Carol Kwiatkowski. 2012. "An Exploratory Study of Air Quality Near Natural Gas Operations." *Human and Ecological Risk Assessment: An International Journal* 20 (1): 86-105. Accessed 2014/09/15. doi: 10.1080/10807039.2012.749447.

Fracking pollution travels hundreds of miles Valentine, K. (2015, April 30). Retrieved from http://thinkprogress.org/climate/2015/04/30/3653252/fracking-air-pollution-downwind/

A report from Coming Clean catalogs field investigations of air pollution from fracking operations. "When the Wind Blows", Coming Clean, June 2016. Accessed at http://comingcleaninc.org/

Various pathways of exposure to pollution from natural gas operations increase the risk of human health harms. Krupnick, A. J., H. Gordon, and S. M. Olmstead. 2013.

"Pathways to Dialogue: What the Experts Say about the Environmental Risks of Shale Gas Development". Resources for the Future. www.rff.org/shaleexpertsurvey.

Greenhouse Gases

Greenhouse gases (GHG) that are produced by fossil fuels will be emitted by the activities associated with the proposed PennEast pipeline and will contribute to climate change through the warming of the earth mainly through the release of methane (CH4) and carbon (CO2). Natural gas leakage from the process that produces and delivers natural gas has powerful impacts on the climate at a global scale.

> "Methane has 34 times the greenhouse-warming potential (GWP) of CO_2 (on the 100-year time horizon); on the 20-year time horizon, methane has 86 times the GWP of CO_2). A recent study suggests that methane leakage should be below 3.2 percent to realize net climate benefits from the transition, while field measurements of methane losses have found a range from between 0.3 percent and 17 percent (see Table 1 below for references)." ("The Potential Environmental Impacts of Fracking in the Delaware River Basin", Steven Habicht, Lars Hanson and Paul Faeth, August 2015, page 54.)

Table 1. Potential methane emissions from projected development in the DRB, based on methane leakage rates reported from field measurement (top-down) studies.

		Potential Methane Emissions (Bcf)	
Study	Leakage Rate	Average Year	Maximum Year
Peischl (2015) [92]	0.3%	0.1	0.3
Peischl (2015) [92]	1.6%	0.4	1.4
Peischl (2015) [92]	1.9%	0.4	1.7
O'Sullivan (2012) [93]	3.6%	0.8	3.2
Miller (2013) [94]	3.7%	0.8	3.2
Petron (2012) [95]	4.0%	0.9	3.5
Karion (2013) [96]	8.9%	2.0	7.8
Schneising (2014) [97]	9.1%	2.1	8.0
Caulton (2014) [98]	10.0%	2.3	8.8
Peischl (2013) [99]	17.3%	3.9	15.1
Average	6.0%	1.4	5.3

Bcf = billion cubic feet.

("The Potential Environmental Impacts of Fracking in the Delaware River Basin", Steven Habicht, Lars Hanson and Paul Faeth, August 2015, page 60.)

The recognition that methane is a more powerful greenhouse gas than carbon in the critical short term of 20 years (considering factors such as the rapid pace of climate change and the disproportionate impacts of climate change on poor and disadvantaged communities) has led many scientists to sound an alarm about the runaway release of methane to the atmosphere by the proliferation of natural gas development. Some of

the seminal studies that have documented the need to dramatically reduce natural gas emissions in order to address climate change include:

Howarth, R.W., R. L. Santoro, and A. R. Ingraffea. 2011. “Methane and the greenhouse-gas footprint of natural gas from shale formations.” *Climate Change* 106 (4): 679-690.

Howarth, R.W., R. L. Santoro, and A. R. Ingraffea. 2012. “Venting and leaking of methane from shale gas development: response to Cathles et al.” Climatic Change (2012) 113:537–549 DOI 10.1007/s10584-012-0401-0.

The DEIS does not address the full life cycle – the upstream and midstream operations and the associated infrastructure – of the proposed project. In fact the global warming potential of methane is only stated as 25 (Page 4-205) with no discussion of the all-important 20 year time scale – the near-term period of time when a tipping point is expected to be reached that will cause catastrophic climate impacts on human populations and the natural world. The proposed PennEast pipeline will perpetuate natural gas development and the increase of methane leakage to the atmosphere, contributing to global climate change. The entire cycle of natural gas development from extraction through processing and delivery must be factored into the environmental impact analysis for this project.

Section 10.2 Noise

The noise effects in the Sourlands from the Spectra (Texas Eastern) compressor station should be analyzed due to the interconnect with the station by the proposed PennEast pipeline. Any and all noise that will be added should be considered individually and cumulatively at the existing station, compared to current noise levels as well as regulatory standards. This is not mentioned in the DEIS.

As state earlier in this comment under Section 4.9.4 and 4.9.5, noise from HDD, blasting, drilling and pounding must be analyzed considering human and wildlife impacts.

Section 4.11 Reliability and Safety

Safety problems in the pipeline industry are not adequately addressed by DOT regulations and public safety is not assured. Worker safety is also not adequately addressed. Safety issues are well documented by the Pipeline Safety Coalition and in many information sources. http://www.pscoalition.org/ The myriad issues are cataloged for various pipeline uses, including natural gas transport in scholarly articles such as “Pipeline Safety and Security: Is it No More than a Pipe Dream?”, Trudy E. Bell, The Bent of Tau Beta Pi, Winter 2015.

Two issues that are poorly addressed are the corrosion of pipelines caused by mixed gas types (i.e. wet and dry gas) and the over-pressurization of a pipeline in an effort to force a larger volume of gas through the line. With approval from regulatory agencies, a company can increase the volume of gas being moved in a line beyond its original design. Over-pressurization occurs more often than is recorded due to poor regulatory tracking.

Studies show that metal loss due to internal corrosion is one cause of leaks, breaks, and explosions. "Internal corrosion hazard assessment of oil & gas pipelines using Bayesian belief network model", Oleg Shabarchin, Solomon Tesfamariam, Journal of Loss Prevention in the Process Industries, 2016.
https://www.researchgate.net/publication/293017125_Internal_Corrosion_Hazard_Assessment_of_Oil_Gas_Pipelines_Using_Bayesian_Belief_Network_Model?enrichId=rgreq-917dce42a8006ccdd0be28d9927b02fc-XXX&enrichSource=Y292ZXJQYWdlOzI5MzAxNzEyNTtBUzozMjc5NjI5OTQ5ODcwMDhAMTQ1NTIwMzg3OTYxMQ%3D%3D&el=1_x_2

Over-pressurization may have been the cause of the catastrophic pipeline explosion in May 2016 Westmoreland County, Pennsylvania where an explosion of a gas pipeline scorched 40 acres and a man was critically injured when he was burned over much of his body while sitting in his home in the blast zone of Spectra Energy's Texas Eastern pipeline (the home was about 200 yards from the line). The injured man is still suffering disability from his severe burns. The pipeline had been approved two years earlier for higher pressure than it was originally rated for and, if over-pressurization is found to be the cause, is an example of the lack of adequate safety measures in decisions of this kind and is evidence of public safety and local communities not being a priority for agencies when reviewing requests from companies for the use of pipelines.
https://stateimpact.npr.org/pennsylvania/2016/04/29/1-injured-after-gas-pipeline-explosion-in-western-pa/#more-39472

Other important safety issues include scouring of soil beneath and under pipelines which can cause erosion, destabilize the line and result in leaks, breaks, and explosions. Another issue is the scoring on top of pipelines that are buried. This can be especially dangerous in lines that are buried under waterways that are eventually exposed due to weather, currents, storm flows and natural flow fluctuations that shift sediment and river bottom morphology. An accident in the Delaware River for instance, caused a liquid fuel pipeline to rupture near Philadelphia PA causing a gas leak into the river, environmental damage, and prolonged disrupted service. Millions are being spent to replace the line, resulting in economic as well as environmental costs. (The Delaware River Pipeline Relocation Project, FERC CP16-27-000, 2016)

Section 4.12 Cumulative Impacts

Table 4.12-1 erroneously states the Mercer County Future Projects listed in the table are from Lower Hudson Watershed.

As stated under Section 4.10, Air Quality and Noise, all phases of the natural gas production and delivery cycle must be included in the assessment of impacts in the EIS. Gas wells and the gas extraction and fracking process, storage tanks, waste and frack fluid basins, the waste stream produced by drilling and gas extraction processes, gathering lines that deliver the gas to the market pipelines and the compressors that provide needed pressure from the well to the nearest market pipeline, the intra- and interstate pipelines that carry the gas to market, are all part of the life cycle of the natural gas that is the product to be utilized by the proposed PennEast pipeline, regardless of distance from the proposed project. These activities are inextricably connected to the proposed project and cumulatively will have an impact on the environment, making it necessary to assess that impact in order to meet NEPA requirements.

Water Impacts, many reflected cumulatively, from natural gas development are examined in numerous reports, studies and peer-reviewed journals, as described in these recent examples:

Begos, K. (2014, January 05). Retrieved from http://www.usatoday.com/story/money/business/2014/01/05/some-states-confirm-water-pollution-from-drilling/4328859/

Elsevier. (2015 April 8). Fracking fluids contain potentially harmful compounds if leaked into groundwater. Science Daily. Retrieved from http://www.sciencedaily.com/releases/2015/04/150408090323.htm?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+sciencedaily%2Fearth_climate%2Frecycling_and_waste+%28Recycling+and+Waste+News+--

Ferrar, K. J., Michanowicz, D. R., Christen, C. L., Mulcahy, N., Malone, S. L., & Sharma, R. K. (2013). Assessment of effluent contaminants from three facilities discharging Marcellus shale wastewater to surface waters in Pennsylvania. Environmental Science & Technology, 47(7), 3472-3481. doi: 10.1021/es301411q

Kappel, W.M., Williams, J.H., & Szabo, Z. (2013). Water resources and shale gas/oil production in the Appalachian Basin -Critical issues and evolving developments. U.S. Geological Survey. Retrieved from http://pubs.usgs.gov/of/2013/1137/pdf/ofr2013-1137.pdf

Knickmeyer E., & Smith, S. (2015, July 15). Study finds contaminants in California public-water supplies. Associated Press. Retrieved from http://abcnews.go.com/Health/wireStory/study-finds-contaminants-california-public-water-supplies-32476456

Legere, L. (2014, September 9). DEP releases updated details on water contamination near drilling sites: some 240 private supplies damaged by drilling in the past 7 years. Pittsburgh Post-Gazette. Retrieved from http://powersource.post-gazette.com/powersource/policy-powersource/2014/09/09/DEP-releases-details-on-water-contamination/stories/201409090010

Maffly, B. (2014, August 24). Utah grapples with toxic water from oil and gas industry. Salt Lake City Tribune. Retrieved from http://www.sltrib.com/sltrib/news/58298470-78/danish-flats-ponds-company.html

St. Fleur, N. (2015, May 4). Fracking chemicals detected in Pennsylvania drinking water. The New York Times. Retrieved from http://www.nytimes.com/2015/05/05/science/earth/fracking-chemicals-detected-in-pennsylvania-drinking-water.html?_r=0#addendums

Stringfellow, W.T., Cooley H., Varadharajan, C., Heberger, M., Reagan, M.T., Domen, J.K., . . . Houseworth, J.E. (2015, July 9). Volume II, Chapter 2: Impacts of well stimulation on water resources. In: An Independent Scientific Assessment of Well Stimulation in California. California Council on Science and Technology, Sacramento, CA. Retrieved from http://ccst.us/publications/2015/vol-II-chapter-2.pdf

Urbina, I. (2011, February 26). Regulation lax as gas wells' tainted water hits rivers. The New York Times. Retrieved from http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all&_r=0

U.S. Geological Survey (2015, January. 26). Natural breakdown of petroleum underground can lace arsenic into groundwater. Retrieved from http://www.usgs.gov/newsroom/article.asp?ID=4110&from=rss&utm_source=dlvr.it&utm_medium=facebook#.VavGXIsqdyA

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Section 4.12.4 Potential Cumulative Resource Impacts of the Proposed Action

Under Section 4,12.4 potential cumulative resource impacts are considered. A more inclusive list can be developed from scholarly papers that have examined cumulative and long-term impacts of gas pipelines such as *Utility Stream Crossing Policy*, James Norman, et al., Etowah Aquatic Habitat Conservation Plan, July 13, 2008, "The Effects of Converting Forest or Scrub Wetlands into Herbaceous Wetlands in Pennsylvania: A Report to the Delaware Riverkeeper Network", Schmid and Company, Inc., Consulting Ecologists (2014), and *Professional Review & Comment on Natural Gas Pipeline Impacts to Terrestrial Ecology prepared for Delaware Riverkeeper Network*, Kevin Heatley, Restoration Ecologist (2012).

As stated in "WHITE PAPER: Pipelines A Significant Source Of Harm", published by Delaware Riverkeeper Network:

> "The large amount of land disturbance created during pipeline construction results in increased stormwater runoff, sedimentation, and erosion of the land and stream channels.
>
> The cumulative impact of multiple construction sites for water crossings on a stream or river has the potential to significantly degrade the quality and flow rate of the waterbody. The capacity of a water system to recover from a multitude of impacts may be exceeded with the detrimental effects of crossing construction becoming permanent. Recurrent stresses on fish, such as those originating from elevated suspended sediment concentrations, will have negative effects on fish health, survival and reproduction.
>
> Broadly speaking, pipeline ROWs have two kinds of impacts: catastrophic events and chronic impacts. Current regulation focuses mainly on preventing or minimizing harms that are of the catastrophic event kind – such as siltation during construction, erosion from runoff, increased stormwater runoff resulting during or after construction; but the larger ecological harms of pipeline construction is not given the same kind of consideration in current regulation. Forest fragmentation, edge effects, adverse impacts to the quality of adjacent forest, the intrusion of invasive species, and the cumulative impacts of shale gas developments that results from and/or is supported by pipeline construction are all issues generally ignored in current regulation." (Page 11-12)

The potential for cumulative impact to natural resources such as surface waters and natural vegetation, including forests, is underestimated in the DEIS. For example, the Delaware Riverkeeper Network White Paper points out that right-of-ways for pipelines are larger than calculated by applicants and FERC:

> "In addition to the immediate impacts of construction, the ROW will need to be maintained and kept clear throughout the lifetime of the pipeline, which can be up to 80 years. While some companies assert they only keep 50 feet of the original construction ROW open for future monitoring, maintenance and repairs of the pipeline, the Delaware Riverkeeper Network has found that interstate transmission lines tend to be much wider – either by design or because the level of compaction that takes place during construction is so dense it prevents restoration of healthy vegetated habitat. And increasingly pipeline companies are planning for wider widths, 100 to 200 feet, to be kept permanently open (free from mature vegetation) for the life of the project." (Page 12-13)

Section 4.12.4.1 Geology and Soils

Soil percolation testing conducted by professional engineers for Delaware Riverkeeper Network along right of ways, including staging areas and temporary construction areas, proves that soils that are disturbed during construction are permanently compacted with damage to soil structure that limits infiltration of precipitation through the soil to groundwater. Infiltrating precipitation recharges aquifers and also provides water to hydrologically connected water features such as wetlands, natural springs and seeps. This, in turn, decreases time of travel across the land surface which increases rate and volume of stormwater runoff and reduces or eliminates water quality benefits provided by naturally vegetated land with functional soil absorption. Flooding can occur on receiving streams that are overloaded with runoff, causing stream destabilization and changing geomorphology of the stream. This can degrade habitats and alter the hydrology of a stream which can affect benthic life in a stream, fish and wildlife as well as riparian vegetation. These damaging effects can cascade to cause substantial degradation of tributaries and larger water bodies downstream. Another impact of compacted soils is the lack of the soil to regenerate natural vegetation, causing land erosion and sedimentation of receiving waterways and degrading habitat and environmental quality.

Section 4.12.4.2 Waterbodies, Groundwater, and Wetlands
Section 4.12.4.3 Vegetation, Wildlife and Habitat, and Aquatic Resources

Cumulative impacts to the region's water resources and to the Delaware River will compound as the tributaries are affected. In the Sourlands, this would involve several streams with the potential to have significant adverse impacts on the downstream river.

The streams in the Sourlands that will be impacted include: Alexauken Creek, Swan Creek, Moore Creek, Fiddlers Creek, Jacobs Creek, Woolsey Brook, Woodsville Brook, Baldwins Creek, and Peters Brook; 13 (original route) and 18 (revised route) stream crossings of these waterways and/or their tributaries are proposed. These streams are all part of the 55,000 acre Sourland Mountain region that is characterized by hard bedrock geology; contiguous forest; high quality habitats; many headwaters, wetlands and vernal pools; and active farmland. The 16 square mile area is 54% forest and forested wetlands, almost 30% agricultural, and about 14% is developed.

The disturbance of acreage located in the Sourlands for the 400 foot disturbance area along the right-of-way would be: Agricultural – 177.8 acres; Forest – 127.6 acres; Wetlands – 24.1 acres; and Built-up – 121.0 acres. The cumulative loss of resources within this acreage must be considered.

The Sourland Mountain Region

The municipalities in the Sourland Mountain region have over the years adopted strict zoning and health ordinances, riparian corridor protection ordinances, and forest preservation and stewardship policies to protect its fragile resources. In 2005, the municipalities and the Sourland Conservancy completed the *Smart Growth Planning and Management Project for the Sourland Mountain* and in 2010 the Sourland Mountain Comprehensive Management Plan was completed. These were prepared and implemented under New Jersey Department of Community Affairs Smart Growth grants to encourage a regional approach to resource protection. The Sourland Alliance was formed in 2010 when the management plan was adopted by the region's five municipalities in three counties to carry the plan forward.

Additional important planning and protection efforts include the Alexauken Creek Watershed Management Plan completed in 2005 and the Sourland Regional Stormwater Management Plan completed in 2004, both sponsored by NJ Department of Environmental Protection (NJDEP) grants as an inter-municipal and inter-county planning and protection effort utilizing federal funds. Substantial and long term investments have been made over many years by Sourland Mountain communities, state and federal agencies based on the value and recognition of the regional importance of the Sourland Mountain's unique and irreplaceable natural assets.

The Groundwater-Surface Water Connection

One of the driving forces in this planning and protection effort is the natural scarcity of the groundwater resources in the Sourlands due to the poor yielding aquifers of its geologic formations. This makes the base flow of the springs and seeps that originate on the mountain, and the headwaters and the streams they form, essentially important in terms of stream flow quality and quantity. Disruption of the hydrologic regime of these streams has a large impact on the Mountain's streams and on downstream

waterways. The flow and quality of the water in these streams require protection to maintain healthy and flowing conditions.

The streams that would be crossed by the proposed PennEast pipeline will be negatively impacted due to disturbance of the aquifer recharge areas that feed the groundwater that provide base flow to these streams. The geologic formations of the Sourlands have no primary porosity for transmitting water so groundwater storage and flow occur through secondary porosity – small openings or fractures in the large expanses of rock. The rock is close to the surface and its poor recharge ability makes the thin-soiled forest floor of great value and vulnerable to disruption. The spongey forest soils absorb water and slowly release it to the underlying fractures, infiltrating precipitation to the groundwater. These soils, and the ecosystem of which they are part, process and filter out potential pollutants. Removal or disturbance of the forest and its floor can quickly destroy its ecological functions.

Pipeline construction will require blasting, excavation, placement of pipe, possible directional drilling, land clearing and reforming, removal of vegetation, including mature trees, soil mantle disturbance and soil compaction, and destabilization of steeply sloped areas. Trees and the forest ecosystem will be removed, soils disturbed and the soil matrix destroyed, causing precipitation to run off instead of infiltrating. The reduction of the already very limited recharge of the aquifers will reduce the expression of groundwater to the surface and limit critical base flow. The hydrologic connections to wetlands, vernal pools and other surface water features will also be disrupted, potentially causing their degradation or total loss. Local groundwater wells that people rely on could suffer diminished yield, a devastating loss since the Mountain is a sole source aquifer. Downstream flood flows will increase because there will be a volumetric replacement of water that was infiltrated with water that instead runs off the surface. Water quality will be degraded due to the loss of forest filtration and processing and the increase in erosion and sedimentation to the stream that will occur with storm flows and stormwater runoff.

This is a particular problem for the Sourlands in West Amwell and Hopewell Townships and Baldpate and Belle Mountains where the proposed routes would pass; they are underlain primarily by diabase and hornfels and the Lockatong formation, known by geologists to have amongst the worst water yields in the State.

<u>Direct Stream Impacts</u>

The direct impacts on the streams that would be crossed by either of the proposed routes need to be individually examined in order to accurately assess the cumulative impacts of crossing them. Major direct impacts to streams that will be crossed, either by open cut or directional drilling, include: erosion and sedimentation to streams; destabilization of stream structure; loss of riparian vegetation and introduction of

invasive species; loss of floodplain functions and increased storm and/or flood flows; soil matrix destruction and compaction; stream habitat fragmentation and degradation; aquatic ecosystem destruction; air quality impacts and the deposition of air pollutants on vegetation, soil, and surface water; riparian forest fragmentation; and damage to hydrologically connected water features such as wetlands and groundwater. An accidental blowout of drilling muds, chemical compounds and sediments during drilling required at or near stream crossings is another potential pollution source that could occur during construction of the pipeline. The possibility for leaked gases or other materials from the completed pipeline is also a concern and must be evaluated by PennEast. In addition, the cumulative effect of the negative impacts to the streams throughout the entire length of the project have the potential to degrade waterways that receive flows from multiple streams crossed by the proposed pipeline (such as the Delaware River) and the connected watershed lands.

Erosion and sedimentation – Erosion of uplands, riparian areas, stream banks and stream bed will destabilize the stream's morphology, causing changes to stream ecology and flow regimes. Sediment entering the stream is considered the most damaging effect of construction activities and the disturbance of a stream by the proposed pipeline crossing will result in sedimentation. The resulting filling in of the natural stream bottom and the interstitial spaces of the stream bottom and changes to the natural riffles and variable depths of the stream degrades or destroys natural stream habitat needed by benthic life, fish, other aquatic and terrestrial species. Sediment deposition smothers macroinvertebrates that reside there, make it difficult if not impossible for these species to come back, reducing biodiversity and the ecosystem health that is essential for the chain of life of the stream.

Riparian vegetation loss – The removal of vegetation from the riparian and floodplain areas adjacent to the stream to gain access for pipeline open cut or directional drilling under a stream - depending on how much of a naturally vegetated buffer remains - causes direct harm to the stream being crossed. Riparian vegetation loss removes trees and plant foliage that provide shade that moderates temperatures and that provide habitat for species that are temperature sensitive or light sensitive. Vegetation removal destroys plant-based ecosystems and the necessary detritus that feeds the stream with nutrients and other natural inputs such as woody debris. Riparian vegetation loss also makes banks less stable and increases erosion, reducing the ability of floodplain and riparian areas to absorb and retard storm flows and stormwater runoff, increasing flooding and flood damages and reducing water quality due to the loss of pollutant filtering and processing that is provided by a healthy vegetative buffer.

Soil compaction – Construction activity in the riparian areas of a stream cause soils to compact, reducing infiltration rates and soil porosity. This compaction will occur with the placement of equipment, staging areas and pipeline installation but can occur after just

a few passes of a pickup truck on exposed soils. The reduction of infiltration in the riparian area of a stream causes less precipitation and stormwater to be recharged to shallow groundwater systems which will, in turn, reduce water flows from the ground to the stream, disrupting stream flow regimes and high quality base flows. It will also reduce the ability of the floodplain and riparian area to perform as the sponge nature intends it to be, increasing storm flows and flooding downstream. Studies show that the compaction remains even after construction is completed unless there is a restoration plan to restore soil values – even then, once the soil matrix and mantle is disturbed by excavation the original functions of intact soils are difficult if not impossible to restore. The result of pipeline construction is the degradation of healthy soil systems adjacent to the stream.

Forest fragmentation and habitat fragmentation – Construction of the pipeline through or under streams will fragment the riparian and/or floodplain corridor, reducing the ecological values that are currently in place. Since a cleared area must be maintained in perpetuity (for the life of the project), the fragmentation of the stream corridor is permanent and has generational adverse environmental impacts on quality, diversity and environmental functions of the forest and other habitats associated with the stream. This will in turn reduce wildlife and vegetative community health and diversity that rely on intact forest and habitat corridors connected to stream systems. This means that hydrologically connected water features such as wetlands and/or vernal pools will also be negatively impacted due to changes in shallow groundwater flows and the complex hydrology of wetlands ecosystems.

These impacts are in large part unavoidable and are no less damaging if the route is co-located with an existing cut across a stream such as a road, grassed area, or, as proposed by PennEast's alternate route, along a utility right-of-way. In fact, where there is an open crossing that has been disturbed and maintained across a stream, widening or re-disturbing the cut to co-locate the pipeline will compound harm already done by the previous intrusion, loading additional environmental burdens on a stream that is already struggling to overcome previously inflicted damages. Because crossing a stream cannot be avoided, the adverse impacts of the pipeline to these streams are substantial and long-lasting.

<u>The Sourland Mountain Streams and Waterways</u>

Alexauken Creek - FW2-TM(C1). The Alexauken Creek (and all its tributaries) is classified as a Category 1 waterway by NJDEP (NJAC 7:9B 1.15). A Category 1 waterway, according to NJDEP, is protected from any measurable change in water quality because of exceptional ecological significance, water supply significance, or exceptional fisheries resources.

The Alexauken Creek drains a watershed of 14.899 miles. Its headwaters extend into East and West Amwell Townships through forest, agricultural and residential areas. The headwaters dip into the East Amwell Grasslands. The creek has much intact riparian buffer and through planning efforts more riparian buffers are being restored. The Alexauken is a largely undeveloped watershed, especially in its upper reaches in the Sourland Mountains. Land conservation efforts by the County, both townships, and D&R Greenway have provided protected lands in this Creek's watershed, some of which have trails. Hunterdon County preserved land in the upper reaches of the creek in East Amwell where they built the South County Park, which houses the County 4-H Fairgrounds. Some years ago a solid waste landfill site was defeated by concerned residents in the headwaters of this watershed due to sensitive environmental features. The Alexauken flows into the Lower Delaware Wild and Scenic River.

Delaware Riverkeeper Network's stream monitoring program sampled the Alexauken monthly from 1997 to 2000. DRN data shows that the Alexauken Creek meets C-1 requirements based on four basic empirical categories and one observational category from 1997-2000. These categories are: Avg. DO=7 mg/L or higher; pH of the system=6.5-8.0; Nitrate-Nitrogen levels=less than 1mg/L; ortho-phosphate levels=less than 0.2 mg/L. The Alexauken Creek consistently exceeded all these standards. The stream would be crossed by the PennEast pipeline in a rural area where water quality was documented as very high.

Swan Creek – FW2-NT. Swan Creek holds the reservoir that supplies Lambertville and neighboring areas with drinking water but it is not even marked on the PennEast pipeline map as a recognized feature. The revised route crosses the stream and reservoir watershed.

Swan Creek drains 3.752 miles of watershed area. It enters the river through Lambertville at river mile 148.60. The watershed is largely rural/agricultural with some intact riparian buffer. Above the Lambertville Water Company's water supply reservoir, the southern branch of Swan Creek is mostly agricultural and is protected to some extent by the land holdings of the water utility. Swan Creek's headwaters are of high quality and provide a mix of ecological purposes. The stream below the reservoir and the northernmost part of the creek also provide high ecological value. The creek bed is rocky and aesthetically valuable and residents along the creek are trying to provide riparian protection and re-establish a naturally vegetated buffer.

Flood damages resulting from heavy storm flows and possible reservoir management problems have caused extensive downstream damages in Lambertville. A pipeline crossing of Swan Creek will disturb the riparian area, require traversing of steep slopes along the creek and could cause destabilization of an already precarious stream structure, risking increased stream flows in storms and increasing flooding and flood

damages in Lambertville and in the residential communities adjacent to the creek above Rt. 29. Depending on the exact location of the crossing, the multiple dam structures could be compromised.

The picturesque spillway at Swan Creek in Lambertville provides social and cultural value to the community and requires protected water quality. The City of Lambertville is a National Register Historic District. The Lambertville Public Boat Launch is in the area of the creek's confluence with the Delaware River. The historic Delaware River wing dam is just below the mouth of the Creek. The Creek flows directly to the Lower Delaware Wild and Scenic River.

Moore Creek – FW2-TM. This creek flows through mostly agricultural land and wooded, natural watershed lands, draining 9.390 square miles. The Howell Living History Farm, parts of Goat Hill that support state listed species and several hundred acres of adjacent preserved land shelter this creek's watershed, including Baldpate Mountain Park. The creek is a popular trout fishing location. The geology is mixed including the Lockatong Formation but dominated on Baldpate Mountain by diabase with hornfels, steep rocky outcroppings, dense woodland and scenic vistas that allow views across the river to Bowman's Hill, Pennsylvania. The creek originates in the westernmost portion of Sourland Mountain and flows to the Wild and Scenic Delaware River. Baldpate Mountain, a protected nature preserve under the wing of the State Green Acres, Mercer County, Hopewell Township and Friends of Hopewell Valley Open Space, contains state-listed species of flora, varied wildlife and high quality wetlands. The watershed includes the Pleasant Valley National Register Rural Historic District and other important historic features.

There is one sewage treatment plant discharge from the Mercer County Correctional Facility into Moore Creek from a tributary that enters the creek from the north, just above its confluence with the Delaware River, downstream of the proposed pipeline crossing. Due to its natural low flow volume and a mandate to protect the creek's water quality, tertiary wastewater treatment is required for this Sewage Treatment facility. Moores Station Quarry is located on the south side of the creek across from the Correctional Facility. For years this quarry stored a mountain of spoils from quarrying on site until a catastrophic blowout of thousands of tons of sediment into the creek occurred in 2002, a violation of stormwater regulations and stream protection law. Hopewell Township, Mercer County Soil Conservation District, and Delaware Riverkeeper Network worked to remedy the stream pollution problem that resulted from the blowout and eventually Hopewell Township oversaw the permanent removal of the entire spoils pile. Close watchdogging and a concerned local community have allowed this creek to struggle back to high water quality.

Prior to these challenges, the Moore Creek watershed was faced with the possibility of quarry expansion which would have destroyed most of its natural values including the creek's flows and water quality. The local community, Delaware Riverkeeper Network and other groups, and conservation leader Ted Stiles, opposed the rezoning of the area for quarry use, and the quarry did not expand outwards.

The result was the preservation of what is now the Ted Stiles Preserve and Mercer County's Baldpate Park, the result of passionate commitment on the part of people who appreciate and fought to protect Baldpate Mountain, Moore Creek, and the adjoining subwatersheds of the Delaware River and as the result of several levels of government support and funding. The proposed pipeline route that would cut through Baldpate Mountain would compromise all that this community has worked so diligently to restore and protect and all that taxpayers have invested to preserve this natural landmark.

Delaware River Basin Commission (DRBC) data and spot checks by Delaware Riverkeeper Network's "stream school" conducted on this creek, including macroinvertebrate and visual monitoring results, affirm the high quality of Moore Creek. The Creek discharges directly to the Lower Delaware Wild and Scenic River.

Fiddlers Creek – FW2-TM. This Creek's watershed drains 2.031 miles and enters the Delaware at river mile 143.20 just above Titusville. State listed species are located in the watershed area for Titusville. Titusville is a National Register Historic District. The creek is largely wooded and farmland. Baldpate Mountain Park, which begins at Moore Creek watershed, extends over to Fiddlers Creek, providing natural preserve and park protection to the waters of Fiddlers Creek. Many other acres of open space are intact in this watershed, providing mature woodlands and healthy riparian buffers. Washington Crossing State Park is just to the south. The Creek discharges directly to the Lower Delaware Wild and Scenic River.

Jacobs Creek -- FW2-NT**.** This is a relatively large watershed, draining 12.856 miles in several townships. There are some intact riparian buffers. This creek and its tributaries travel mainly through residential and mixed uses (including the Merrill Lynch Office Complex, the Mercer County Airport and Route I-95) and some open farmland. The creek experiences flooding and water quality degradation from these uses but is a struggling waterway that could be greatly improved with better land use, expanded naturally vegetated riparian corridors and improved natural-based stormwater management. Resources that are impacted by the Creek and that provide value to the creek include: the Delaware and Raritan Canal State Park; NJ State owned Rotary Island group; and the Falls of the Delaware wetlands just downstream. The Creek discharges directly to the Lower Delaware Wild and Scenic River.

The Delaware and Raritan Canal (D and R Canal) – The Canal can divert up to 100 million gallons of water per day from the Delaware River at Bulls Island above Stockton, New Jersey and, with flows from local tributaries, is the sole source of water supply for roughly 1.5 million New Jersey residents in central New Jersey. The Delaware Canal Commission implements a body of regulation to protect the water quality of the Canal which is part of the New Jersey Water Supply Authority's system. Delaware and Raritan Canal State Park protects the integrity of the park as a designated State and National Historic District and recreational resource. The proposed pipeline will cut though Sourland subwatersheds that provide some runoff flow to the D and R Canal. Degradation of the quality of runoff due to upland and upstream land and stream changes that will result from the pipeline project will adversely impact the Canal and potentially the water supply for 1.5 million people.

Existing High Stream Water Quality Cannot Measurably Change

All the Sourland Region streams within the pipeline routes are protected under NJ Surface Water Quality regulations (NJAC 7:9B 1.15). The only Category 1 waterway in the proposed pipeline routes is Alexauken Creek but Category 2 streams also require no measurable change in existing water quality but some lowering is allowed based on economic and social justification. Because the PennEast pipeline is not justifiable, these streams cannot be degraded. But the routes are proposed to cross them nonetheless.

The Delaware River is designated as Wild and Scenic by an Act of Congress due to its outstanding natural, recreational and scenic values, and is classified at this location as Special Protection Waters, an anti-degradation classification that requires protection of the high water quality of this part of the Delaware River under Delaware River Basin Commission water quality regulations. All tributaries in the Sourlands that flow to the Delaware River must be protected under this designation, which mandates strict water quality protection to meet required standards and restoration of quality where needed. Several tributaries to the Delaware's Special Protection Waters would be crossed by the proposed routes: the Alexauken Creek, Swan Creek, Moore Creek, Fiddlers Creek, Jacobs Creek and Woolsey Brook.

The Delaware River supplies drinking water to 17 million people every day, including New York City and the Philadelphia metropolitan area; approximately 5 million people rely on the Delaware River for drinking water downstream of the proposed PennEast project. The quality of the Delaware and the drinking water it supplies is directly tied to the health and quality of the tributaries that flow to it and subwatersheds that comprise it. The cumulative impacts must be fully assessed, which is not accomplished in the DEIS.

Section 4.12.4.4 Land Use, Recreation, Special Interest Areas, Visual Resources

As commented under Section 4.9.1.2, the Lower Delaware Wild and Scenic River is a special resource that will be permanently harmed by the proposed PennEast pipeline. The cumulative impacts will remove or diminish the outstanding values of the River that were recognized by Congress when this portion of the Delaware was entered into the federal Wild and Scenic Rivers System.

Like the Milford Bluffs north of the Sourlands, the cliffs that are visible from the river, from the Pennsylvania waterfront, and from Route 29 Scenic Byway at Lambertville and in West Amwell and Hopewell Townships, Belle Mountain, and Baldpate Mountain are scenic assets that must be considered in terms of cumulative diminishment of the region.

Adding to the right-of-way for the existing utility lines will add to their detrimental scenic impact. The scar of the decades-old utility right of way is part of a legacy of intrusion through this portion of the Sourlands that poses a continuing challenge to the quality of the region due to the spread of invasive plants, the permanent fragmentation of the forest, the lack of a healthy riparian corridor where the right-of-way crosses streams, and scenic degradation. Co-location of the proposed pipeline with the utility lines does not lessen its damage to the streams that will be crossed, the riparian lands that will be ruined, the land that will be cleared, the soils that will be disrupted and compacted and the trees that will be lost. Like the original route, the proposed revised co-located pipeline will permanently degrade the watersheds it traverses and provide a source of pollution to the streams that flow from these watersheds.

Recreational uses that will be cumulatively impacted are an extensive hiking trail system throughout the Delaware River Watershed and Sourland region. Baldpate Mountain is a locally prized park, protected by years of dedication and public funds. Municipal, County, and State funds and program support are invested in these regionally important recreational uses that the parks and trail systems provide.

Recreational fishing is a highly popular and economically important recreational use of the river that is jeopardized if water quality and habitat are degraded by the cumulative effects of stream and natural vegetation damage. For instance, the removal of trees that now offer scenic views from the river, from communities along the river, and communities that surround the region, would cause long-lasting scenic degradation fi they are removed for the proposed PennEast pipeline.

Canoeing, kayaking, boating and swimming in the Delaware River and canoeing, trail biking and hiking along the Delaware and Raritan Canal State Park is an essential recreational use that would suffer from resource degradation.
http://www.dandrcanal.com/park_index.html https://www.nps.gov/lode/index.htm

The use of the municipal and county parks in the Sourlands and the region is an important year-round recreational use that also would be negatively impacted by the compounded diminishment of the high water quality and scenic values that support these uses. http://mercercountyparks.org/
http://www.co.hunterdon.nj.us/depts/parks/parks.htm

Section 4.12.4.6 Cultural Resources

As commented under Section 4.9, there is not enough information in the DEIS to conclude that there is not cumulative impact damage from adverse effects to the Sourland's cultural resources, as well as to regional cultural resources throughout the project. Incomplete, missing, or undocumented consultation with native tribes and nations and African American communities is evident in the DEIS. The consultation and engagement of these relevant communities is required to gather cultural resource information and to document resources that could be negatively impacted by the proposed PennEast pipeline.

Section 4.12.4.7 Air Quality and Noise
Section 4.12.4.8 Climate Change

As commented under Section 4.10, cumulative impacts of the proposed PennEast pipeline to air quality, noise and climate change will compound to impose significant unacceptable impacts.

Section 4.12.5 Conclusion

The conclusion of the DEIS is unsupportable by scientific literature and by assessment of the impacts to the resources of the region. The impacts are long-term and compound to diminish the resources of the Sourlands, the Lower Delaware Wild and Scenic River, and of the region. Water and air quality impacts, ecological and resource impacts of the full life cycle - cradle to grave - of natural gas development must be considered in order to accurately reflect the full breadth of effects of the proposed PennEast pipeline.

It is incorrect that the proposed project would have any positive benefit due to the replacement of other fossil fuels with natural gas should any be used for power. As explained earlier in these comments under Section 10.1, Greenhouse Gases, natural gas is actually worse than other fossil fuels on a 20 year time scale because it is 86 times more powerful in trapping heat than carbon. It is this 20 years that is critical for changes that constitute the "tipping point" for climate.

The global community must ensure that the goal of limiting warming to 1.5 – 2.0 degrees C that was agreed to at COP21 in Paris, and by President Obama who recently announced the United States will join the COP21 accord, is achievable if climate

change is to be addressed effectively in the coming decades. The cumulative effect of the leakage of the estimated 3.5% of methane resulting from natural gas development will make it impossible to meet the warming limit and honor the goals that have been set, based on science and world agreements. The proposed PennEast project will contribute to the release of methane that will indelibly damage the climate, jeopardizing our future. There is no environmental, social or economic benefit possible from these actions.

Submitted by the Sourland Conservancy
83 Princeton Ave. Suite 1A, Hopewell, NJ 08525
http://sourland.org/

September 6, 2016

Attachments: 1 – Map, Sourlands Region PennEast Parcel Analysis

2 – Letter from Sourland Alliance to NJDEP, dated 2.3.2016

February 11, 2016

Comment to: Mark Harris, Division of Land Use Regulation Mail Code 501-02A P.O. Box 420 Trenton, New Jersey 08625-0420

Re: **Flood Hazard Area Individual Permit and Major Modification of Freshwater Wetlands Individual Permit for TRANSCO Skillman Loop Natural Gas Pipeline**

The Sourland Alliance submits these comments on the proposed above referenced permit changes for the TRANSCO Skillman Loop.

The Sourland Alliance is a cooperative municipal alliance established in 2009 by resolution of each Sourland Mountain municipality: the Townships of East Amwell, Hillsborough, Hopewell, Montgomery and West Amwell. The Alliance brings together representatives from the municipalities that meet regularly throughout the year to review activities in the Sourland region, comment on plans and policies in the townships, and work to further cooperative planning and Sourland Mountain resource protection.

The members of the Alliance are annually appointed by each municipal government and work through a variety of ways to protect the Sourland Region's resources and its residents, including non-regulatory and regulatory strategies and innovative planning opportunities.

The Skillman Loop traverses areas adjacent to the Sourland Mountain region and its sensitive environmental resources and crosses through Montgomery Township, one of the Sourland Alliance townships. The disruption and degradation caused by this Loop is substantial and we oppose the permitting of any further activity that poses adverse environmental impacts.

We advocate that DEP require an Environmental Impact Statement (EIS) to be completed in order to consider any new permits or changes to these individual permits. This will require a full analysis of all options for crossing the stream and require in-depth geologic analysis of the environmental conditions.

By regulation, a comprehensive geologic analysis should have already been performed by the applicant under current regulations and now that it is clear that the lack of an in-depth assessment is a grave error - due to the failure of the Horizontal Directional Drilling (HDD) - this analysis should be required before any decision on permitting is made and before any construction continues at this location. The applicant must prove, as required by DEP regulation, that all adverse impacts to the stream and wetlands covered by these permits cannot be avoided. Without an accurate geologic assessment and a full analysis of the various alternative means to cross the stream and wetlands, the mandate to protect the state's resources cannot be adequately met.

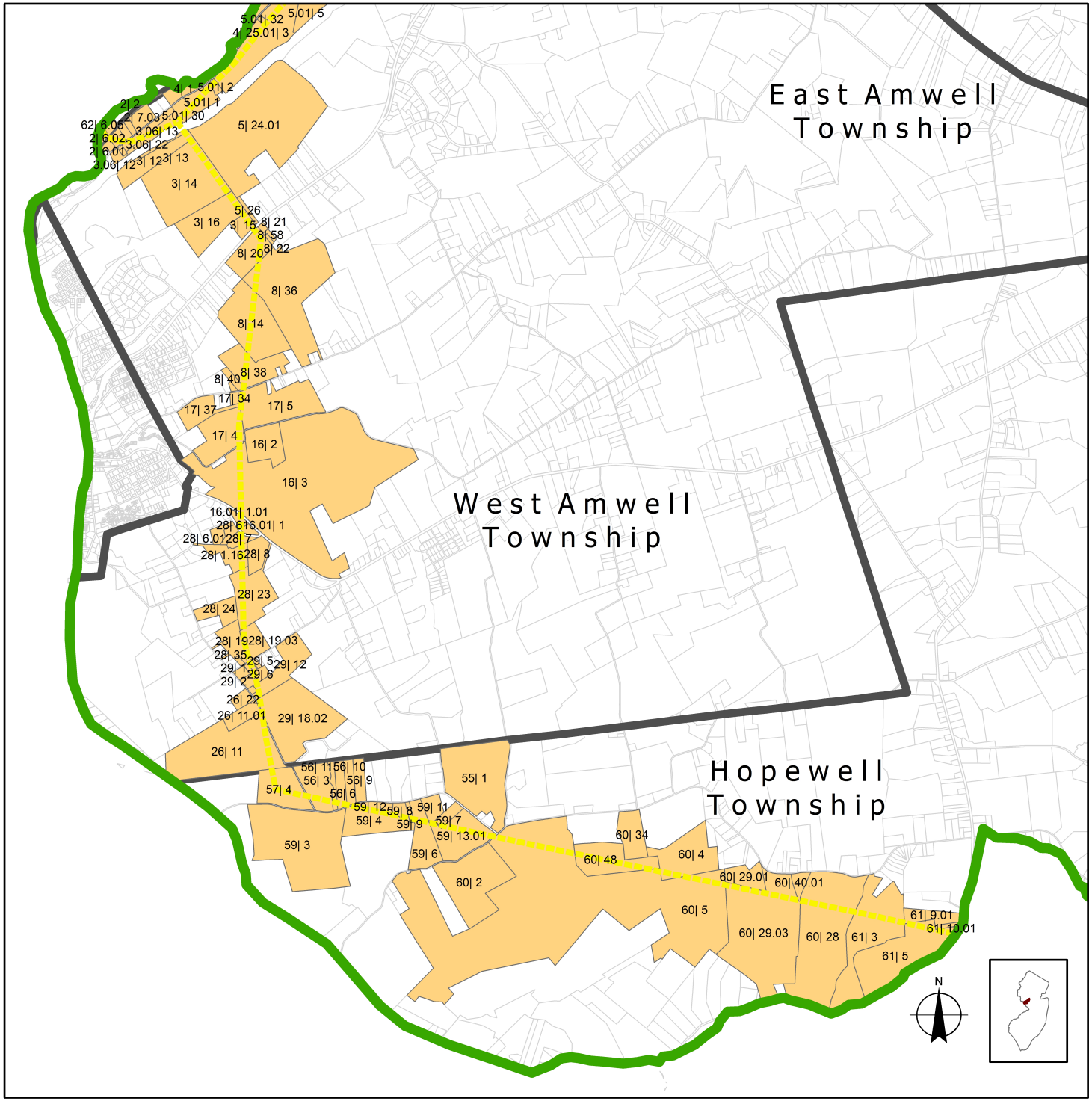
DEP should also fully consider the use of HDD as required by the current permits and deny the Flood Hazard Area Individual Permit because the loss of a drill bit and the difficulty in horizontal drilling is not unusual in these situations. The cost to the applicant of mechanical failure must not drive how this crossing is completed; the time and expense this failed HDD has cost the company should not influence the permit decisions that DEP will make. Drillers lose drill bits regularly in similar situations and simply have to make the necessary technical and mechanical adjustments to complete the HDD crossing. Because HDD drills underneath the waterway to make a conduit for the pipe rather than cutting an open ditch across the stream, this method can minimize stream damage and should not be dismissed simply because the applicant has requested it and has encountered difficulty. An open cut crossing has immediate and permanent negative impacts on riparian areas, floodplains, and streams, including erosion and sedimentation of the stream, removal of natural vegetation and damages to riparian areas and the floodplain that can limit the ability of these soils to absorb, filter and percolate which can in turn increase stormwater runoff and flooding, degradation of stream habitats and stream morphology, and damages to wetlands.

DEP should require a full explanation from the applicant that explains what exactly happened at the site where the HDD “failed” and what was the environmental impact of the failed HDD. This is important in order to assess the full environmental impacts from this project.

The permit must require that the method of crossing preserve the environmental values of the stream and wetlands to the fullest extent possible; an open cut crossing will cause indelible and substantial environmental harm to the stream and wetlands – harm that we feel cannot be justified. The stream where the pipeline is crossing before pipeline construction is preserved land and is an important natural resource for the Township and the region.

If, despite these objections, the stream crossing moves ahead, DEP must also require full restoration of the area impacted by construction, no matter what method is used, using restoration practices that provide environmental and water quality benefits such as native plantings, restored soil structure and mantle, vegetated riparian areas with permanent natural protections, long-term monitoring for and removal of invasive species, and other conservation measures..

Presented by Sarah Roberts, Chair, Sourland Alliance, on behalf of the members of the Sourland Alliance.



SOURLAND CONSERVANCY

SOURLANDS REGION PENNEAST PIPELINE PARCEL ANALYSIS: ALTERNATE ROUTE

Legend

- Sourlands Border
- Pipeline: Alternate Route
- Affected Parcels Alt Route
- Municipal Borders

Produced by Kevin Burkman
GIS Analyst
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Please consult the Sourland Conservancy for all source data

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