COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF ENVIRONMENTAL PROTECTION

RESPONSE TO COMMENTS ON THE SETTLEMENT FOR NATURAL RESOURCE DAMAGES RESULTING FROM THE AUGUST 2005 ASH SPILL FROM THE MARTINS CREEK STEAM ELECTRIC STATION

The Commonwealth of Pennsylvania, Department of Environmental Protection ("Department" or "DEP") now responds to comments it received on the proposed settlement of claims against Talen Generation, LLC and Martins Creek, LLC, successors to PPL Generation, LLC and PPL Martins Creek, LLC, respectively, for Natural Resource Damages that resulted from the ash spill from the Martins Creek Steam Electric Station, located in Lower Mount Bethel Township, Northampton County, that began on August 23, 2005.

The Department published notice of the proposed settlement in the *Pennsylvania Bulletin* on July 25, 205, which began a 60-day public comment period required by Section 1113 of the Pennsylvania Hazardous Sites Cleanup Act, 35 P.S. § 6020.1113. Comments received by the Department during the 60-day comment period are addressed below.

List of Individuals who Provided Public Comments:

Name	**Affiliation**
(1) Joe Baylog	President, Forks of the Delaware Chapter of Trout Unlimited
(2) George Magaro Sr.	Resident of Allentown
(3) Lewis A. Parker	Resident of Easton
(4) Mona Taylor	Resident of Nazareth
(5) David Brandes	Professor, Lafayette College
(6) Dru Germanoski	Professor, Lafayette College
(7) Andy Smith	Associate Professor and Head of Film and Media Studies, Lafayette College
(8) Megan Rothenberger	Assistant Professor, Lafayette College

Department's Responses to Public Comments:

1. **Comment (1):** Mr. Baylog, on behalf of the Forks of the Delaware Chapter of Trout Unlimited, expresses support for the settlement and the removal of dams on the Bushkill Creek in the City of Easton.

   Response: The Department recognizes and thanks Mr. Baylog for his comment.

2. **Comment (2)**: Mr. Magaro expresses his belief that the spill did not harm the American shad population in the Delaware River and also his concern over an elevated acetone reading in a grab sample taken from the Delaware River on the morning of August 26, 2005. He further opines that the river and discharges to the river need to be monitored since the Delaware is at constant risk of being impacted from agricultural runoff,

development along the riverbanks, oil spills, dumping or waste and sewage treatment plants. Finally, Mr. Magaro, on behalf of the Delaware River Shad Fisherman's Association, requests a water quality report from both the Pennsylvania and New Jersey Departments of Environmental Protection on a yearly basis.

Response: The Department recognizes and thanks Mr. Magaro for his comment regarding the American shad population in the Delaware River following the fly ash spill.

With regard to Mr. Magaro's comment concerning acetone, immediately after the spill occurred, the Department sampled PPL's outfall and conducted surface water sampling in the Delaware River at two points above the outfall, one point at the outfall and one point below the outfall. This sampling was performed on a weekly basis for approximately three months after the spill. The frequency of the sampling decreased as the spike in elevated metals concentrations declined over time. Surface water sampling was then performed on a monthly basis until March of 2006, and then quarterly until the first quarter of 2008, when the Department discontinued its surface water sampling associated with the spill. Results were compared to background data obtained from a Department maintained Water Quality Network station located just upstream from the spill in order to get a better picture of the effects from the spill.

When this sampling began, the Department unexpectedly discovered elevated acetone in the river above the PPL outfall. The investigation showed that acetone appeared to be coming from the New Jersey side of the Delaware River above the Belvedere Bridge, rather than from the PA side. The Department shared this information with the New Jersey Department of Environmental Protection ("NJDEP"), which then used the information to conduct its own investigation. PADEP does not believe that NJDEP definitively identified a source of the acetone. During PADEP's continued river water sampling that extended into 2008, acetone detection dropped off and it was no longer a concern.

With regard to Mr. Magaro's comment on Delaware River monitoring, the Department's Bureau of Point and Non-Point Source Management (the "Bureau") and the Clean Water Program in DEP's six regional offices (Northeast, North Central, Norwest, Southwest, South Central and Southeast) are responsible for protecting and preserving the waters of Pennsylvania, including the Delaware River.

The Department implements several different programs through the Bureau, including:

- establishment of water quality standards;
- water quality monitoring and assessments;
- municipal sewage management and planning (Act 537);
- National Pollutant Discharge Elimination System (NPDES) permitting (which imposes limits and monitoring requirements on discharges to water courses) and inspection of point source discharges;
- Water Quality Management (WQM) permitting and inspection of land discharges and facility construction;
- Administration of the nutrient trading program; and

- permitting and inspection of biosolids treatment/processing facilities and residential septage management.

The implementation of these programs is done through Department regional offices and different divisions within the Bureau.

One of the divisions in the Bureau, the Division of Water Quality Standards ("DWQS"), includes several sections designed to protect and manage clean water and public health. Water quality standards are used to assess whether Pennsylvania's rivers and lakes are clean and pure enough to support fish and other aquatic life; recreation; water supply for drinking, agriculture and industry; and other protected uses. In addition, the water quality standards are implemented by other Bureau programs as regulatory tools to prevent pollution of the Commonwealth's waters.

The DWQS sections that protect clean water include, among others:

- the Standards Section, which is responsible for developing and establishing the water criteria and protected uses that surface waters must meet;
- the Monitoring Section, responsible for designing and implementing surface water monitoring for water chemistry, biology (invertebrates, fishes, algae, plants and pathogens), and physical habitat; and
- the Assessment Section, responsible for developing and implementing protocols to analyze and evaluate monitoring data to determine surface water attainment of water standards.

Under its DWQS, the Department operates the Pennsylvania Surface Water Quality Network ("WQN"), which is a statewide, fixed station water quality sampling system designed to assess the quality of Pennsylvania's surface waters and the effectiveness of the water quality management program. Currently on the Delaware River, the Department has six WQN stations from Hancock, NY to Chester, PA. They are, No. 104 on the West Branch of the Delaware in Buckingham Twp., Wayne County, No. 185 on the Delaware River in Damascus Twp, Wayne County, No. 103 on the Delaware River in Port Jervis, Orange County, NY, No. 194 on the Delaware River in Lower Mt. Bethel Twp., Northampton County, No. 101 on the Delaware River in Morrisville Twp., Bucks County and No. 182 on the Delaware River at the Delaware and Pennsylvania border. These stations are sighted in order to provide surface water quality data along the reach of the Delaware in Pennsylvania. As stated above, data from a WQN station just upriver from the Martins Creek ash spill was used to provide background data used for comparing samples to those collected at and below the discharge. The WQN station provided valuable information that helped assess impacts from the spill on surface water quality.

Through the Bureau, its divisions like the DWQS, and the six regional offices, the Department monitors, tests and establishes criteria and limits that are designed to enhance and protect water resources in Pennsylvania, like the Delaware River. In the event of a spill or emergency, such as the Martins Creek fly ash spill, the Department can respond, collect and analyze data, and take steps necessary to address the situation and protect the environment and public welfare.

With regard to Mr. Magaro's request for a yearly water quality report, there are a number reports on the water quality of the Delaware River that are publically available. The Delaware River Basin Commission ("DRBC") has done extensive reporting and has provided links for many of those reports on its website. Specific links to DRBC water quality reports that may be of interest are:

Assessment of Water Column data collected in response to a fly ash release on the Delaware River:

- http://www.nj.gov/drbc/library/documents/FlyAshAssessment_061906.pdf

Various DRBC water quality reports on a number of issues:

- http://www.nj.gov/drbc/about/public/publications/index.html

Delaware River and Bay Water Quality Assessment Reports:

- http://www.nj.gov/drbc/quality/reports/quality/index.html

Other data is available through USEPA STORET, however this is raw data, rather than a report, and the commenter may not find it to be as useful. Water quality data is collected from the WQN stations by the United States Geological Survey ("USGS") and sent to DEP's Central Office in Harrisburg. Once gathered, the WQN data is downloaded to EPA's STORET system on a recurring basis. Data can be accessed by going to this link and typing in desired search criteria:

- http://www.waterqualitydata.us/portal/

3. **Comment (3)**: Mr. Parker expresses support for the settlement and the removal of dams on the Bushkill Creek in Northampton County.

   Response: The Department recognizes and thanks Mr. Parker for his comment.

4. **Comment (4):** Ms. Taylor requested that a list of all toxins from the spill and their symptoms be made available. She expressed concerns over health issues being experienced by someone close to her and asked if wells and soil had been tested. She also requested copies of testing reports and how spill material was disposed of.

   Response: Extensive sampling was performed following the spill by the Department, PPL, and several different entities in an effort to accurately assess both short and longer term impacts from the spill. The data was collected, analyzed and made publically available throughout the cleanup process, and served as a basis for performing and assessing cleanup actions and addressing damages to natural resources. Both the Department and PPL created websites where cleanup and sampling information was made publically available. The Department maintains the sampling data and reports in its files, along with other information related to the Martins Creek fly ash cleanup. Those files are available for review by contacting (570) 826-2519 and making an appointment.

Sampling and analyses that was performed included:

Air Sampling
Air sampling was performed from September 12, 2005 - September 16, 2005 for total dust and arsenic. There were no short or long term concerns identified by the sampling.

Riverbank Sediment Sampling
Extensive riverbank sediment sampling was performed following the spill. Samples were collected in September 2005, November 2005 following a high water event, and in June 2006. Sample locations focused on observable or suspected areas of sediment and ash accumulation. Riverbank sample results were below PA and NJ human health direct contact standards for a host of metals. From an ecological perspective, there were slightly elevated concentrations of arsenic in only 7 of 85 samples collected. Arsenic, however, was not above the human health direct contact standard.

River Bottom Sediment Sampling
Sediment samples were also collected from the river bottom in September and November 2005 and June 2006. They were obtained in three different sections of the river from Martins Creek to Easton, Easton to Hendrick's Island and Hendrick's Island to Trenton, NJ. Sampling showed that concentrations of certain metals were elevated in September 2005 immediately following the spill. In November 2005, concentrations generally dropped, in all likelihood due to the storm event in October 2005. Generally, the Lehigh River was found to be contributing to metals concentrations in the Delaware below the confluence of the two rivers. While metals in the river bottom showed an initial increase, they began to drop over time. There was, however, an overall loading of metals to the river as a result of the spill.

River Water Sampling
To gain a better understanding of the impact of the spill on surface water, the Department performed surface water sampling for approximately 50 parameters beginning on August 26, 2005 on a weekly basis. This data was compared to background data obtained from a Department maintained Water Quality Network Station located just above the spill zone. As the elevated metals concentrations decreased, the frequency of sampling decreased and went to quarterly by early 2006. This sampling continued through the first quarter of 2008 and was discontinued when results were not showing cause for concern. Early in this process, the Department found high levels of acetone from a location above the spill zone. This suggested that there was another site causing impacts to the Delaware River and PADEP reported this information to NJDEP. Acetone detection in the surface water sampling from a source above the Martins Creek Ash Spill zone dropped off over time. The Department also found that the Lehigh River was influencing concentrations of certain parameters from the confluence with the Delaware River.

Other entities also collected surface water samples, including PPL, NJDEP, DRBC, the U.S. Geological Survey, the Philadelphia Water Department and the New Jersey Water Supply Authority. Water quality data was sent to DRBC, which compiled and assessed the data at the request of PADEP and NJDEP. On June 19, 2006, DRBC published a

document entitled "Assessment of Water Column Data collected in response to a fly ash release on the Delaware River". The general conclusion reached in the report was that there were short term elevated levels of certain metals following the release, including some exceedences of PA human health criteria for arsenic and other exceedences for lead, aluminum and copper, but there were not long term elevated levels. The river water sampling conducted through the first quarter of 2008 verified that the levels of these metals dropped and the Department is not aware of any spikes since that time.

A physician from the Division of Environmental Health Epidemiology of the Pennsylvania Department of Health reviewed river water sampling results with a state toxicologist and determined that the exposure to hazardous substances (in particular arsenic) in the Delaware River because of the spill was minimal at most. She further stated:

> There does not seem to be any health threat from this exposure, based on all the results I have seen.
>
> Regarding possible exposure to arsenic, the organic form of arsenic is less toxic than the inorganic form. Fish taken from the river would have the less toxic organic form of arsenic and would, therefore, be okay to eat.
>
> There is no concern about swimming because of the spill. If you were swimming during the spill, don't worry that your health will be affected down the road. Any exposure to arsenic was very minimal.

Sampling data collected from the Delaware River helped form the basis for positions taken during and after the cleanup by members of the Natural Resource Damage Assessment Team ("NRDA Team"), which currently consists of the Pennsylvania DEP, the New Jersey DEP, and the Pennsylvania Fish and Boat Commission, in consultation with the Delaware River Basin Commission. The NRDA Team determined that there was an overall loading of metals in the Delaware River caused by the spill and that concentrations decreased over time. The NRDA Team further concluded that there were impacts to natural resources associated with the spill and cleanup. Those impacts are being addressed in the NRDA settlement, which will include dam removal projects and a mussel restocking program.

Groundwater Monitoring

Extensive groundwater monitoring was performed by PADEP and PPL through existing groundwater monitoring wells and additional wells that were added during cleanup. The wells were predominately located in the vicinity of Ash Basin Nos. 1 and 4, with some additional wells in the area of impact. The frequency of obtaining readings from the wells initially increased from quarterly to weekly. As time passed, the reading frequency dropped to monthly and back to quarterly. Following the spill, there was an initial spike in metals concentrations, but, with the exception of selenium in a location related to the placement of fly ash in Basin No. 1, those levels declined over time. Elevated selenium concentrations associated with Basin No. 1 exceeded the state drinking water standard for a time, but then declined. Quarterly monitoring of wells continues and concentrations have been below state and federal drinking water standards.

Drinking Water Sampling

Residential drinking water wells were sampled quarterly from August/September 2005 through August 2007 for substances typically found in fly ash, including 16 metals. More than 240 wells were sampled in both Pennsylvania and New Jersey. Well owners in New Jersey were given the opportunity to send results to the Warren County Health Department or the New Jersey Department of Environmental Protection for independent analysis. Well owners in Pennsylvania could send results to the Pennsylvania Department of Health. Constituents of concern, including arsenic, selenium and mercury, came back below state and federal drinking water standards and impacts to drinking water wells were not identified.

City of Easton Water Supply

Immediately following the spill, on August 25, 2005, the City of Easton, which draws its water supply from the Delaware River, suspended intake to its filter plant and temporarily relied on stored water to supply residents until appropriate sampling could be performed to determine whether the fly ash spill was affecting the water supply. The Department conducted water sampling and analyses and found that post treatment finish water was not showing concentrations of metals above drinking water standards. Additionally, PPL performed extensive sampling and while there was one arsenic exceedence in the raw water at the intake, post-filtering finish water samples did not show any exceedences of drinking water standards. After suspending operations on August 25th, the plant resumed operations on August 26th and there were no suspensions or disruptions in public water supply from the plant.

Biological Assessment

NJDEP performed an extensive fish tissue study not long after the spill. Laboratory analysis did not show any notable impacts to fish communities. PPL also performed both a short and long term biological assessment, which included tissue sampling and surveys of fish, benthic macroinvertebrates and periphyton. For the short term bioassessment, conducted in accordance with EPA Rapid Bioassessment Protocols and under the supervision of the Academy of Natural Sciences in Philadelphia, samples were taken from August 29, 2005 through September 5, 2005. No short-term impacts to aquatic communities were identified. The longer term bioassessment, which began in June 2006 under the supervision of the Academy of Natural Sciences, was performed as part of PPL's Phase IV Work Plan. This assessment also included testing of fish, mussels, insects and other aquatic life from the River. PPL's long term bioassessment concluded that there were no long term impacts. The NRDA Team, however, felt there were impacts to aquatic organisms, particularly mussels. The evaluation of mussel impacts was a primary focus for the NRDA Team because of their inability to avoid the spill and their sensitivity to pollutants. This assessment is one of the considerations underlying the proposed Natural Resource Damages settlement.

All of this sampling and analyses was performed in advance of the preparation of a Natural Resource Damage Assessment Report ("NRDA Report"), which was written by the Department and reviewed by members of the NRDA Team. The NRDA Report includes

a discussion of sampling and natural resource data that supports the conclusions therein, including the settlement recommendations. Based on all of the sampling and analyses performed during the course of the spill, the cleanup, and afterward, the Department has determined that the proposed settlement is reasonable, fair, in the public interest, and consistent with the goals and terms of Pennsylvania's environmental statutes.

With regard to Ms. Taylor's question about the disposal location of spill material, consistent with the need to expedite cleanup in order to minimize any adverse impacts, ash material was originally collected and sent to Ash Basin No. 1at the Martins Creek Plant beginning on Wednesday, August 24, 2005. Ash Basin No. 1 was a Bottom Ash disposal basin that, pursuant to the terms of its permit, could be used for fly ash disposal for a brief period in the event of an emergency. Beyond that, Department approval for additional disposal of fly ash was required.

The Department authorized the temporary use of Ash Basin No. 1 until October 10, 2005 for cleanup material and disposal of ash from the active coal units (Units 1 and 2). Approval was contingent upon there being no discharge from the basin and increased monitoring of the four existing Basin No. 1 groundwater monitoring wells. Pursuant to the Department's approval, increased monitoring was to occur monthly for the annual monitoring parameters and continue until three months after discharge to Basin No. 1 terminated.

As cleanup advanced, PPL began to encounter problems with the emergency use of Ash Basin No. 1 for fly ash management. Specifically, a seep was identified at the toe of the Basin No. 1 berm. In addition, laboratory analytical data showed an increase in selenium in Basin No. 1 groundwater monitoring wells. Use of Ash Basin No. 1 for cleanup materials and fly ash slurry from Units 1 and 2 was discontinued on September 9, 2005 and cleanup material was re-directed to Ash Basin No. 4. On September 16, 2005, the Department approved a truck ramp design for transportation to and disposal of cleanup material in Basin No. 4. PPL began pumping water and slurry from Ash Basin No. 1 to Ash Basin No. 4 and moving cleanup material to Basin No. 4. Formal approval of Ash Basin No. 4's return to service was issued by the Department on December 27, 2015 after extensive engineering improvements were made to the discharge structure. Notice of the approval was published in the Pennsylvania Bulletin on January 14, 2006. [36 Pa.B. 200]. The coal units resumed operation on December 28, 2005 and were later permanently shut down in September 2007. Ash Basin No. 1 permanently closed on November 25, 2014 and Ash Basin No. 4 permanently closed on July 2, 2013.

After the seep and selenium exceedence from Ash Basin No. 1 were identified, PPL performed a groundwater assessment and a structural investigation. Sampling data was collected from the Ash Basin No. 1 monitoring wells and additional monitoring wells were installed. In addition, PPL sampled in excess of 240 residential water wells. Wells were tested even if they were distant or not hydrogeologically connected to the Basin. The company also supplied bottled water to residents who submitted requests. Drinking water wells did not show any impacts and groundwater monitoring wells showed a gradual decrease in selenium and fly ash related constituents from the initial elevated level as ash

disposal was moved from Basin No.1 back to Basin No. 4.

5. **Comment (5)(6)(7) and (8):** Mr. Brandes, Mr. Germanoski, Mr. Smith and Ms. Rothenberger expressed their support for the proposed settlement and dam removal project(s). They further expressed their belief that it will have a positive impact on the campus community, the Bushkill Creek, and that the project(s) will create educational possibilities. Commenters made clear that their comments are *not* an official endorsement by Lafayette College, but wanted to express their support as faculty members.

   Response: The Department recognizes and thanks Mr. Brandes, Mr. Germanoski, Mr. Smith and Ms. Rothenberger for their comments.

Conclusion:

After consideration of the comments received and the record associated with the Department's Natural Resource Damages claim, including input from the NRDA Team members, the Department has determined that the proposed settlement is reasonable, fair, in the public interest, and consistent with the goals and terms of Pennsylvania's environmental statutes.