

# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*



December 28, 2012

Mr. Michael J. Caverly  
VP-Financial Nuclear-Development  
PPL Bell Bend, LLC  
Two North Ninth Street  
Allentown, PA 18101-1179

Re: Requirements for Consumptive Water Use Mitigation and Passby Flows  
for PPL Bell Bend, LLC – Bell Bend Nuclear Power Plant;  
Salem Township, Luzerne County, Pennsylvania;  
Commission Pending Nos. 2009-079 (SW) and 2009-080 (CU)

Dear Mr. Caverly:

The purpose of this letter is to provide PPL Bell Bend, LLC (PPL) with Susquehanna River Basin Commission (Commission) staff's recommendations for consumptive use mitigation and passby flow requirements for the Bell Bend Nuclear Power Plant (BBNPP). In lieu of PPL's request for a "conditional approval" in March 2013, staff is amenable to providing a letter in this time frame that details the status of PPL's BBNPP application and outlines general conditions that would be required in order for staff to recommend approval of the application at a future date.

The *Consumptive Water Use Application* and the *Surface Water Withdrawal Application* submitted by PPL are being reviewed for content with respect to Commission regulations under Section 3.10 of the Susquehanna River Basin Compact and 18 CFR §806, Subpart B (Application Procedure), and the general standards set forth in the Commission's *Consumptive Use Mitigation Plan* (Publication No. 253, adopted by Commission Resolution No. 2008-01) and Commission Policy No. 2012-01, *Low Flow Protection Policy related to Withdrawal Approvals*, adopted on December 14, 2012.<sup>1</sup> More specifically, the proposed withdrawal from the Susquehanna River and the consumptive use of that water are being reviewed under 18 CFR §806.4, §806.22, and §806.23 to develop appropriate recommendations to limit, condition, or deny the withdrawal to avoid significant adverse impacts, including adverse cumulative impacts to the water resources of the basin.

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<sup>1</sup> Commission Policy No. 2012-01 has very recently replaced Commission Policy No. 2003-01, *Guidelines for Using and Determining Passby Flows and Conservation Releases for Surface-Water and Ground-Water Withdrawal Approvals*, previously adopted in 2003. The project applications are subject to regulations and policies in effect at the time of Commission action.

## CONSUMPTIVE WATER USE MITIGATION

To avoid adverse impacts, Commission staff has determined that the appropriate form of consumptive use mitigation should be the utilization of compensating releases from storage upstream of the project. It has further determined that low flow releases equal to the consumptive use at the BBNPP should trigger when a flow at the Wilkes-Barre U.S. Geological Survey (USGS) stream gage reaches a flow level of the monthly P95 exceedance value (with exceptions noted herein), plus the designated consumptive use in the vicinity of the gage. By tying mitigation to the elimination of consumptive use impacts, we are assured of accomplishing efficient and comprehensive mitigation. Current regulations at 18 CFR §806.22 require acceptable mitigation releases of water from Commission-approved sources for a period of 90 days.

## PASSBY FLOW REQUIREMENTS

As previously discussed, an important requirement will be for PPL to release water (in an amount equal to the plant's consumptive water use) upstream of the proposed plant when passby flow levels are reached. In support of applications submitted for its proposed BBNPP, PPL elected to conduct special project-specific aquatic studies, as provided for under both Commission Policy Nos. 2003-01 and 2012-01, to support alternate passby flow requirements. The Commission has received the following reports citing findings of these studies conducted by PPL or its authorized representatives:

1. **Potential Effects of the Bell Bend Project on Aquatic Resources and Downstream Users** (Volumes 1 and 2), Report No. 21665.001-LFHC3, prepared for PPL Bell Bend, LLC by Normandeau Associates, Inc., dated April 24, 2012
2. **Potential Effects of the Bell Bend Project on Water Quality of Backwater Areas used by Fry and Young-of-the-Year Smallmouth Bass for the Year 2012** (Volumes 1 and 2), Report No. 21665.001-SMB2, prepared for PPL Bell Bend, LLC by Environmental Resources Management, dated September 10, 2012
3. **Bell Bend Nuclear Power Plant Low Flow Impact Analysis-Mussels**, Document No. 565-065 Rev. 0, prepared for PPL Bell Bend, LLC by Kleinschmidt and others, dated October 2012

In general, Commission Policy No. 2012-01 recommends standard monthly passby flows equal to the calculated P95 monthly percent exceedance values for withdrawals from rivers in Aquatic Resource Class 6, which is the appropriate classification to apply given the location of the proposed project. In consideration of Commission Policy No. 2012-01 and the special aquatic studies, Commission staff recommends imposition of the passby flows identified in the table below. All recommended passby flows, as a percentage of average daily flow, are lower than those that would result from implementing the previous Commission Policy No. 2003-01, which recommended a passby flow of 20 percent of the annual average daily flow for a Warm Water Fishery. For USGS gage 01536500 for the Susquehanna River at Wilkes-Barre,

Pennsylvania, 20 percent average daily flow is 2,753 cubic feet per second (cfs). Note that recommended passby flow values listed in the table are adjusted to the project site location.

***Recommended Passby Flows***

<b>Month</b>	<b>Passby Flow at the BBNPP Site (cfs)</b>
January	None
February	None
March	None
April	None
May	1,750
June	1,750
July	1,750
August	1,200
September	890
October	1,010
November	None
December	None

**Species of Concern**

Freshwater mussel species (Green Floater, Yellow Lamp, Elktoe, and others) are present. A significant decrease in the smallmouth bass (SMB) population in the Susquehanna River has been documented; the cause is still being investigated by USGS, the Pennsylvania Fish and Boat Commission (PFBC), and others. The Instream Flow Incremental Methodology (IFIM) study focused on eight targeted fish species as indicator species. BBNPP consumptive use was shown in the study to impact various life stages of the targeted species, with the northern hogsucker being the most impacted.

**Special Considerations**

Another nuclear power plant, Susquehanna Steam Electric Station (SSES), is located immediately upstream of the proposed BBNPP site. Consumptive water use by SSES is not mitigated until flows at the Susquehanna River at Wilkes-Barre gage reach 7Q10 (835 cfs); therefore, the combined consumptive water use by both BBNPP of 43 cfs and SSES of 74 cfs, as well as the two thermal discharges, must be evaluated for impacts to aquatic life and other users located downstream from BBNPP. The locations of these two PPL plants downstream from the Wilkes-Barre gage will also be a factor in setting flow values at the gage for compliance monitoring.

The unusual channel morphology and associated hydraulics become increasingly important as flows decline and bedrock ridges and gravel bars emerge. In particular, an existing gravel bar dewater critical Green Floater mussel habitat at flows below 1,300 cfs.

The months of May through July are indicated as critical months for young-of-the-year smallmouth bass (YOY SMB) according to studies performed by USGS, when the juveniles are particularly vulnerable to stresses from high water temperatures (T°) and low dissolved oxygen (DO). During July in particular, water temperatures frequently exceed biological thresholds established by USGS studies and Pennsylvania Chapter 93 Water Quality Standards, and low river flows contribute to stresses to aquatic life.

Although mussels may experience stress during flows lower than 1,300 cfs as more areas become dewatered, the recommended August threshold was set at 1,200 cfs, the monthly flow corresponding to approximately a 90 percent exceedance (P90) value. The IFIM study indicated that the rate of negative impact to aquatic life increases significantly at and below the flow rate of 1,200 cfs in August.

In months where temperature and dissolved oxygen concentrations are less important factors for aquatic life, the recommended passby requirements are based on the 95 percent flow exceedance for that month. For the months of November through April, passby requirements are not warranted and thus not recommended.

### **ADDITIONAL CONSIDERATIONS**

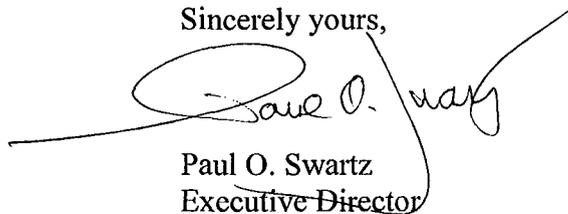
The recommendations herein represent staff's evaluation of the project at this time. Please note that the project is subject to Commission regulations and policies in effect at the time of Commission action. Other caveats include the following:

1. These recommendations are subject to revision based on changes to state and federal requirements, including but not limited to Pennsylvania Chapter 93 Water Quality Standards currently undergoing review and the addition of any additional state or federally listed aquatic species.
2. All additional scientific data available at the time of Commission action will be considered by staff and may result in revisions to these recommendations.
3. Any changes or modifications to the project, including a change to a different energy source, will require additional review that could result in revisions to these recommendations.
4. Any recommendations by Commission staff are not binding on the Commission.
5. Recommendations herein are not transferable in the event of a sale or other transfer of the project.
6. Consistent with past policy and practice, the Commission will incorporate the special conditions in the Pennsylvania Department of Environmental Protection's 401 Water Quality Certification into its recommendations when it acts on these applications.

7. Staff's recommendations were developed assuming that PPL mitigates SSES at 7Q10 events. Additional/more frequent mitigation for that facility could serve to lessen the impacts of BBNPP, and thus result in revised recommendations.
8. Changes to the Commission's consumptive use mitigation requirements or revisions to policies and regulations could cause the Commission to modify recommended passby thresholds.
9. PPL may propose operational alternatives, instream modifications, or other mitigative measures in an effort to lessen or obviate the need for passbys at the recommended thresholds. PPL may submit for staff consideration study interpretations demonstrating that partial mitigation will address the impacts expected at the recommended thresholds.
10. Assumptions about upstream water usage, hydrologic statistics, proposed BBNPP operations, or study interpretations are subject to change following consultation with partner agencies and prior to plant operation, and thus result in modified passby thresholds.

Should you have any questions regarding the review process, or if Commission staff can assist you in any way, please contact Jim Richenderfer at (717) 238-0423, extension 224.

Sincerely yours,



Paul O. Swartz  
Executive Director

cc: Gary Petrewski – PPL Bell Bend, LLC