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ACCESSION NBR: 8005070541 DOC. DATE: 80/04/30 NOTARIZED: NO  
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv  
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 Office of Nuclear Reactor Regulation

DOCKET #  
 05000387  
 05000388

SUBJECT: Comments on NUREG-0564, "Draft Suppl to DES:" applicant  
 should more fully investigate water quality problems  
 associated w/releases & present procedures for ameliorating  
 them.

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# SUSQUEHANNA RIVER BASIN COMMISSION

1721 North Front Street

Harrisburg, Pennsylvania 17102

From the Office of the  
Executive Director

April 30, 1980

Director  
Division of Site Safety &  
Environmental Analysis  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Re: Docket Nos. 50-387, 388

Dear Sir/Madam:

The following comments, prepared by the staff of this Commission, are in response to the "Draft Supplement to the Draft Environmental Statement" (NUREG-0564) relating to the Susquehanna Steam Electric Station. They focus primarily on clarification of positions attributed to the Commission and apparent errors of fact or methodology. The comments are keyed to the section numbers of the "Draft Supplement".

### Section 3.1-Introduction

We believe that the second sentence of the second paragraph would more accurately reflect the circumstances if it read as follows: "In response to comments by the Pennsylvania Dept. of Environmental Resources and SRBC regarding the desirability of optimal development of the site to meet water supply needs in addition to those of the Susquehanna plant, the applicant submitted ...." Clearly, our comments have nothing to do with water conservation.

We note also that we have not seen copies of any of the correspondence referenced in the second paragraph.

### Section 3.2.2-Augmentation Releases

There is a minor misstatement of the SRBC consumptive use make-up requirement. The first sentence refers to the "average consumptive use ... by SSES" in defining the low flow criterion, whereas the regulation specifies "the 7-day 10-year low flow plus

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the project's total consumptive use and dedicated augmentation." [18 CFR 803.61(c)(1)(i)] As we interpret the regulation, the appropriate value is the actual rather than the average consumptive use. This notion is stated correctly in Section 4.4.2.1. It should be corrected here.

#### Section 4.2-Impacts on Water Use

The last sentence refers to an application for a NPDES permit applicable to reservoir discharges. We are not aware of any such permits.

The section also concludes that "... the quality of the water discharged from the Pond Hill Reservoir will meet applicable DER and EPA criteria except for an occasional high level of iron." This conclusion should be reviewed in light of the comments relating to Section 4.3.2 below.

#### Section 4.3.2.2-Inundation & Operational Impacts

On page 4-5, it is stated, "... the potential that eutrophic conditions will occur in Pond Hill Reservoir is relatively high.", suggesting that water quality problems are quite likely. Later on that page it is stated, "... once phosphorus reaches the bottom sediments, very little of it usually returns to the epilimnion." The analysis concludes that productivity levels will decline over time as "... nutrients are lost to bottom sediments." We are less optimistic that such will be the case. If the bottom water becomes anoxic, which seems to be a distinct possibility, phosphorus and ammonia will be released from the sediments. During turnovers, these nutrients would be returned to the epilimnion.

#### Section 4.3.2.3-Discharge System

In the first paragraph under Operational Impacts, there is the statement, "... as presently designed, only hypolimnetic water will be withdrawn." The report then goes on to point out that if this is the case, the result will be cold shock to many of the organisms. The only way we can see that such a conclusion is possible is to assume that for the dam presently proposed the spacing and elevation of the inlet structures remain as planned for the original dam with top elevation at 950' msl. Do you know this to be the case? As recently as April 15, 1980, PP&L has reported to us that the project design has been revised to reflect the "full-size" reservoir (Elevation 990' msl top of dam). Further, that correspondence states that the inlet-outlet structure has been revised from inclined to a conventional multiport vertical tower structure. We assume that the applicant intends to adhere to its

design criteria of having multiple outlets "... so that releases can be made from the reservoir level where the water temperature most closely matches that of the Susquehanna River" (TAMS, "Design Report-Pond Hill Reservoir", February, 1979, p. 3-4).

We do note that the final paragraphs of the Section conclude that the release will cause cold shock, contain large amounts of organic materials, be high in iron, and may be anoxic. We have three comments with regard to these conclusions.

1. We find them difficult to reconcile with the assertion of Section 4.2 that all quality criteria, except for iron, will be met.
2. We cannot accept the conclusion that such releases "should have little impact on the Susquehanna River, since augmentation releases will be infrequent and usually small in volume" (p. 4-9). This argument seems to hang on a long time average concept. Under minimum daily flow of record conditions compensation releases would represent about 10% of the river flow. Moreover, the SRBC consumptive use requirements specify that, "The physical, chemical and biological quality of water used for compensation shall meet the quality purposes for [protection of public health; stream quality control; economic development; protection of fisheries; recreation; dilution and abatement of pollution,]" among others [18 CFR 803.61(b)(1) and (e)]. It isn't clear that this requirement will be met. Finally, it should be noted that our consumptive use regulations require compensation for water removed from the river and not returned to it. Augmentation carries the idea of increasing the flow above the amount available under natural flow conditions.
3. We feel that the applicant should more fully investigate water quality problems associated with the releases and present procedures for ameliorating them.

#### Section 4.4.1-Construction

We have reservations about certain of the parameters used in the temperature modeling. The original analysis by the applicants' consultant used 1975 climatic data to simulate the 1964 drawdown. We feel it would have been more appropriate to use 1964 climatic data. Moreover, we feel that the results are even less appropriate for the larger reservoir. It is our judgment that a new analysis should be made of the larger reservoir, using more appropriate parameters.

It is also stated that the pumping station lies outside the 100-year flood plain. We are unable to verify that statement because of the level of detail used in Figure 2.5. However, the pumping station clearly lies outside of the floodway.

#### Section 4.4.2.1-Water Supply

The second and third paragraphs contain statements that are incomplete and potentially misleading. The second paragraph ignores the fact that the larger reservoir is planned to meet not only the consumptive use requirements of SSES during periods of low flow but also similar needs by other downstream users who might contract for a portion of the Pond Hill Water Supply. To state without explanation that the applicant has assumed a release rate of 2.9 cms, as against its own needs of up to 1.8 cms, is unfair to the applicant, making it appear they are planning a release that bears no relation to their own needs.

"Other uses" are recognized in passing in the third paragraph. However, without any explanation as to the nature of these other uses, the discussion could leave the impression that they are somehow associated with the Susquehanna plant. Also, it would be more accurate to note that, based on the average consumptive use during the design drought, 1.5 cms will be needed by the SSES for replacement of consumed water and 1.4 cms will be available to other users. (A similar misstatement regarding the average consumptive use at SSES appears in the second paragraph.)

The last paragraph of the Section relates to the refilling of the reservoir. You state correctly that the planned operational procedure calls for no pumping from the river when river flow is below 85 cms (3,000 cfs). You should be aware that we have as yet unresolved concerns about possible environmental impacts of pumping at such a low level of river flow.

We assume that the refilling rate of 3.7 cms refers to the pumping capacity of the enlarged project. We have not seen these specifications.

#### Section 4.4.2.3-Hydrologic Design of Dam

We note with concern that the dam design does not meet NRC criteria and that your staff is concerned about potential overtopping. We feel that the design criteria problem is a matter for the Pa. Dept. of Environmental Resources and the applicant to resolve.

### Section 5.1.2-Use of Existing Reservoirs

A statement in the second paragraph misconstrues this Commission's position regarding the use of existing reservoirs. The statement "SRBC's response to this request was that the Cowanesque Reservoir is not now a timely alternative," misinterprets the statement on p. 2-3, Appendix H of the Environmental Report - Operating License Stage. The applicant correctly summarized the comments of our April 17, 1978 letter which suggested that a re-study of all potential water supply uses, the impact of these uses on other project functions, and determination of the necessity for reauthorization be made. The applicant then drew its own conclusion that, "The SRBC comments indicate that Cowanesque Reservoir is not now a timely alternative." (Emphasis added) The draft supplement sets forth as the position of this Commission a conclusion reached by the applicant. (A copy of our April 17, 1978 letter to the Corps of Engineers is attached.)

### Section 5.1.3-Summary

In recent months, we have been working closely with both the Corps of Engineers and Pa. Power & Light Co. to explore the use of the Cowanesque project and an expanded Pond Hill project (enlarged to approximately 22,000 acre-feet of active water supply storage) as complementary water supply sources to meet several needs in the basin, including SSES. The Corps has completed Stage I of its Cowanesque Lake Reformulation Study and expects to have the entire study completed by March, 1982. PP&L estimates at this time that with continued work on the Pond Hill project, the completion date for PP&L storage only is summer, 1983 and with maximum storage, summer 1984. As you are aware, PP&L has announced the in-service date for Unit 1 is now January, 1982 and January, 1983 for Unit 2. At its March, 1980 meeting, the Susquehanna River Basin Commission adopted July 1, 1984 as the date by which Peach Bottom Nuclear Generating Station, Three Mile Island Nuclear Generating Station, and Susquehanna Steam Electric Station must be in compliance with the consumptive water make-up requirements.

### Section 5.2-Alternative Sites

The first paragraph specifies certain parameters relating to the usable water storage requirement in the Pond Hill Reservoir that are no longer relevant. In response to questions raised by our staff, PP&L estimated that the full load consumptive use at SSES will be 52.5 cfs (1.49 cms) based on the drought of record; the Q7-10 at the Wilkes-Barre gage is 800 cfs (24.06 cms); and the consumptive use make-up storage for the full load operation at SSES consuming 52.5 cfs for 106 days is 11,030 acre-feet.

PP&L stated further "that the Pond Hill Project, if intended solely for SSES flow compensation, will be constructed to provide an active storage of 11,600 acre-feet (11,030 acre-feet for SSES plus 570 acre-feet for losses and downstream conservation flow). (Letter from N. W. Curtis, PP&L, to R. J. Bielo, SRBC, September 4, 1979)

The first sentence of the second paragraph refers to "a 1970 SRBC study". The study in question is one made by the Susquehanna River Basin Study Coordinating Committee, an interagency task force made up of representatives from seven Federal departments and agencies and the three basin states. It was chaired by the Corps of Engineers. The report was completed and released several months before this Commission came into existence. The applicant cites the study correctly in the ER-OL, Appendix H, Section 2.4.

#### Section 5.3.1-Benefit-Cost Analysis-No Action Alternative

The benefit-cost analysis for the "river following" alternative developed in this section poses several problems. First, the analysis presented in Tables 5.1 and 5.2 is based on the assumption of a 4-day shutdown occurring every year. This is the average number of days the plant would be shutdown based upon the flow duration curve. The latter assumption implies that an average flow year will occur in each year of the life of the project. But hydrology doesn't work that way. The analysis should have been based upon the expected value of the present worth of the cost of plant shutdown for different flow sequences. The analysis displayed in Table 5.3 apparently utilizes more realistic representation of the flows.

Second, the calculations which produced the 160,000 MWH, 170,000 MWH, and 146,000 MWH values mentioned in the first paragraph of the section are not evident to us. We feel this should be clarified.

Third, the analysis assumes an equal probability of hot and cold shutdown. Our understanding of these terms is as follows:

- a. Cold shutdown means the nuclear reaction is essentially stopped, and no heat is being generated;
- b. Hot shutdown means that the reactor control rods have been inserted to stop the reaction but the reaction has not actually ceased, heat is still being generated, and both primary and secondary cooling loops are carrying away the heat. Under this circumstance, the consump-

tive loss would still be continuing for some time (until cold shutdown is obtained) and the consumptive use would be decaying from its value prior to the beginning of the shutdown.

The point is that if our understanding is correct, hot shutdown is not a viable alternative to consumptive loss make-up, because the consumptive loss continues until cold shutdown is reached. That further implies that in order to use the river follower method, cold shutdown would have to exist on the first day that the flow goes below Q7-10+C and hot shutdown would have had to start some considerable period of time prior to that date.

Finally, under the brief periods of shutdown postulated for the analysis, it is not obvious to us why there should be any significant savings in the costs of operating SSES. While we do not know the components of the "Nuclear Generating Price", surely they are not entirely variable operating costs. It appears that this aspect of the analysis needs to be reconsidered.

#### Section 5.3.2-Use of Existing Reservoirs

The matter of cost of water from the Cowanesque Lake project is not resolved and will not be for some time to come. This Commission is in the process of developing a water supply management program, one component of which is a water pricing plan. The presumption is that SRBC will serve as the wholesale vendor of any water supply storage developed in the basin. Until this entire matter is more fully developed, no one can make any meaningful estimates of the cost of obtaining water from existing reservoirs. Certainly it would not be correct at this point to apply either the prices or pricing scheme of the Delaware River Basin Commission to the Cowanesque Lake project.

#### Section 5.3.3-Pond Hill Reservoir

There is an error in the statement about the cost of electricity for pumping water into the reservoir. The annual pumping cost is the sum of a capacity charge and an energy charge. The 4,500 hp of pumping capacity is equivalent to 3,357 KW. Assuming a (mid-1978) capacity charge of \$12/KW, the annual capacity charge is  $(3,357 \text{ KW} \times \$12/\text{KW}) = \$40,300$ . The energy charge, assuming 30 days of pumping, and an energy cost of \$0.025 per KWH is  $3,357 \text{ KW} \times 30 \text{ days} \times 24 \text{ hrs./day} \times \$0.025/\text{KWH} = \$60,400$ . Thus, the total annual pumping cost is  $(\$60,400 + \$40,300) = \$100,700$ . (See TAMS Design Report, Pond Hill Reservoir, p. 7-2 and Figure 15.)

Director

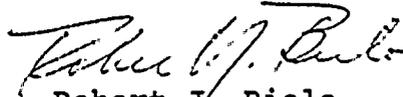
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April 30, 1980

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We appreciate the opportunity to comment on the Draft Supplement. We hope that our comments are helpful.

Very truly yours,



Robert J. Bielo  
Executive Director



# SUSQUEHANNA RIVER BASIN COMMISSION

1721 North Front Street

Harrisburg, Pennsylvania 17102

April 17, 1978

From the Office of the  
Executive Director

Colonel G. K. Withers  
U.S. Dept. of the Army  
Corps of Engineers  
Baltimore District  
P.O. Box 1715  
Baltimore, Maryland 21203

Dear Colonel Withers:

Thank you for providing us with a copy of a request from PP&L asking your office to determine whether the use of the Cowanesque Reservoir's potential seasonal storage capability to meet Susquehanna Steam Electric Station's consumed water make-up needs would be compatible with Cowanesque's other functions and whether such use would be practicable and economically justified. We note from the PP&L request that if it is determined such storage and water use is permissible the company intends to seek a contract with the Corps for the use of Cowanesque water and to submit such contract to SRBC for approval.

I have polled the Commission alternates on the study proposal and would advise that the Commission recognizes the need for the company (PP&L) to explore various alternative measures to obtain make-up water to compensate for consumptive losses of water at its Susquehanna Steam Electric Station during certain periods of low stream flow. Further, the Commission recognizes a need to determine the potential for seasonal water supply storage in the Cowanesque Reservoir for uses other than as outlined by the company.

Essentially the Commission believes that any review of the storage capability of the Cowanesque Reservoir should include: a range of water supply and other water use storage alternatives at the site, a determination of the effects such alternatives would have on flood storage and other project uses, and a determination whether such alternatives would require reauthorization or could be accomplished under current project authorization and Corps' authority.

Col. G. K. Withers

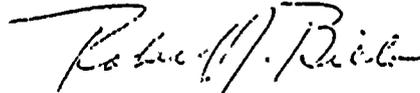
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April 17, 1978

The Commission also wishes to note that if as a result of the study a positive determination is made of the potential capability of Cowanesque Reservoir to meet the water storage needs outlined by PP&L in its request that such finding does not in any way prejudice future Commission action regarding allocation of water from this project.

We will look forward to your findings and will be pleased to cooperate in any way possible.

Very truly yours,



Robert J. Bielo  
Executive Director