

APPENDIX D

MICROBIOLOGICAL ORGANISMS CORRESPONDENCE

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PECO NUCLEAR

A Unit of PECO Energy

PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

June 2, 2000

Mrs. Karen Bassett
Assistant Regional Director
Bureau of Water Supply Management
Pennsylvania Department of Environmental Protection
909 Elmerton Avenue
Harrisburg, PA 17110-8200

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3
Request for Information on Thermophilic Microorganisms

Dear Mrs. Bassett:

PECO Energy Company (PECO Energy) is preparing an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses for Peach Bottom Atomic Power (PBAPS), Units 2 and 3. Current operating licenses for the two-unit plant expire in 2013 and 2014. The renewal term would be for an additional 20 years beyond the original license expiration date. This two-unit nuclear plant uses a once-through cooling water system that withdraws from and discharges to Conowingo Pond. Five mechanical draft ("helper") cooling towers were built on berms adjacent to the discharge canal to supply additional cooling capacity in summer months, but in recent years these cooling towers have not been used.

PECO Energy is preparing a license renewal application in accordance with NRC regulatory requirements. The NRC requires license applicants to provide "...an assessment of the impact of the proposed action {license renewal} on public health from thermophilic organisms in the affected water." The NRC regulations state that "these organisms are not expected to be a problem at most operating plants" but state further that "without site-specific data, it is not possible to predict the effects generically."

The NRC requires this assessment because certain microorganisms associated with cooling towers and thermal discharges are known to have deleterious impacts on human health. These microorganisms include the enteric pathogens *Salmonella* sp. and *Shigella* sp. as well as the *Pseudomonas aeruginosa* bacterium. Other less-common aquatic microorganisms that sometimes occur in heated waters include the Legionnaire's disease bacteria (*Legionella* sp.) and free-living amoeba of the genus *Naegleria* (esp. *Naegleria fowleri*). NRC guidance directs license applicants to consult with the state agency responsible for environmental health to determine if there is a concern about the presence of *Naegleria fowleri* in plant receiving waters. Attached is an excerpt from an NRC document on this topic.

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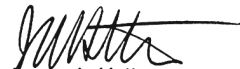
PECO Energy believes that PBAPS discharge temperatures, which do not exceed 110°F (in late summer 1999, daily average temperatures in the discharge canal ranged from 67 to 106.5°F), are below those known to be conducive to growth and survival of thermophilic pathogens. Further, disinfection of the PBAPS sewage treatment plant effluent and NPDES-required monitoring of fecal coliforms in the same effluent reduce the likelihood that a seed source or inoculant would be introduced to the station's heated discharge or Conowingo Pond.

Discharge limits and monitoring requirements for PBAPS are set forth in NPDES Permit 0009733, which was issued by the Pennsylvania Department of Environmental Protection's (PADEP) Water Management Program on July 7, 1995 and amended on January 20, 1998. The NPDES permit states that "the permittee shall provide for effective disinfection of this discharge to control disease-producing organisms during the swimming season (May 1 through September 30) to achieve a fecal coliform concentration not greater than 200/100 ml geometric average, and not greater than 1,000/100 ml in more than 10% of the samples tested" [Part C(l)(E)].

PECO Energy does not expect PBAPS operations and cooling systems to change significantly over the license renewal term, and there is no reason to believe that discharge temperatures will increase or that disinfection would cease. However, we are requesting any information that the PADEP may have compiled on the presence of thermophilic microorganisms in Conowingo Pond in the vicinity of PBAPS, including results of any monitoring or special studies that might have been conducted by PADEP or its subcontractors. We also request your concurrence with the PECO Energy's conclusion that there is no significant threat to the public from thermophilic microorganisms attributable to PBAPS operations.

Please feel free to call Robert Matty at (610) 640-6353 if you have any questions or require any additional information. After your review, we would appreciate receiving your input by December 1, 2000, detailing concerns, if any, you may have on the presence of thermophilic microorganisms in Conowingo Pond in the vicinity of PBAPS, including results of any monitoring or special studies that might have been conducted by PDEP or its subcontractors, or concurring with PECO's conclusions that continued operation of PBAPS would not affect the presence of thermophilic microorganisms in Conowingo Pond in the vicinity of PBAPS. This will enable us to meet our application preparation schedule. PECO will include a copy of this letter and your response in the Environmental Report that will be submitted to the NRC as part of the PBAPS license renewal application.

Sincerely,



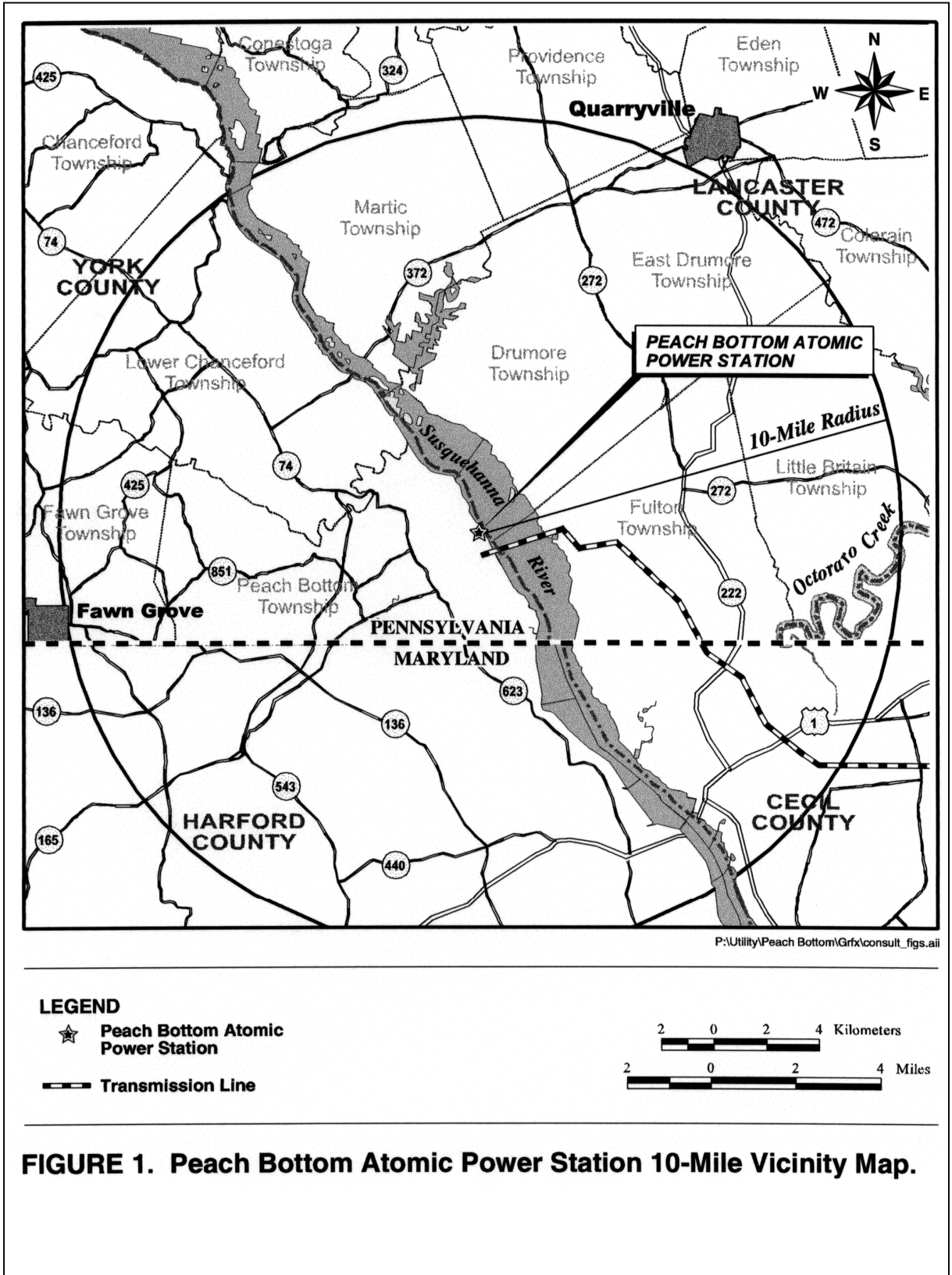
James A. Hutton
Director - Licensing

Enc. (1) Map of PBAPS and vicinity
(2) Cover page and Section 4.3.6 of the Generic Environmental Impact Statement for License Renewal of Nuclear Plants

cc: H. J. Miller, Administrator, Region I, USNRC
A. C. McMurtry, USNRC Senior Resident Inspector, PBAPS

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bcc: Manager, Financial Controls and Co-Owner Affairs,
 Public Service Electric & Gas
 R. I. McLean, State of Maryland
 A. F. Kirby, III, Delmarva Power & Light Company
 R. R. Janati, Commonwealth of Pennsylvania
 G. R. Rainey - 63C-3
 C. P. Lewis - 63C-3
 J. J. Hagan - 62C-3
 J. W. Langenbach - 62C-3
 J. Doering - PB, SMB4-9
 M. E. Warner - PB, A4-1S
 G. L. Johnston - PB, SMB3-2A
 J. P. Grimes - 63B-1
 R. W. Boyce - 63C-3
 R. A. Kankus - 63C-2
 A. A. Winter - PB, A4-5S
 J. G. Hufnagel/TRL - 62A-1
 PBAPS ISEG - PB, SMB4-6
 Commitment Coordinator - 62A-1
 Correspondence Control Desk - 61B-5
 DAC - 61B-5
 K. Patterson, Tetra Tech NUS
 F. Polaski - 63A-3
 W. Maher- 63A-3





***Generic Environmental Impact Statement for
License Renewal of Nuclear Plants (NUREG-1437
Vol. 1)***

4.3.6 Human Health

Some microorganisms associated with cooling towers and thermal discharges can have deleterious impacts on human health. Their presence can be enhanced by thermal additions. These microorganisms include the enteric pathogens *Salmonella* sp. and *Shigella* sp. as well as *Pseudomonas aeruginosa* and the thermophilic fungi (Appendix D). Tests for these pathogens are well established, and factors germane to their presence in aquatic environs are known and in some cases controllable. Other aquatic microorganisms normally present in surface waters have only recently been recognized as pathogenic for humans. Among these are Legionnaires' disease bacteria (*Legionella* sp.) and free-living amoebae of the genera *Naegleria* and *Acanthamoeba*, the causative agents of various, although rare, human infections. Factors affecting the distribution of *Legionella* sp. and pathogenic free-living amoebae are not well understood. Simple, rapid tests for their detection and procedures for their control are not yet available. The impacts of nuclear plant cooling towers and thermal discharges are considered of small significance if they do not enhance the presence of microorganisms that are detrimental to water and public health.

Potential adverse health effects on workers due to enhancement of microorganisms are an issue for steam-electric plants that use cooling towers. Potential adverse health effects on the public from thermally enhanced microorganisms is an issue for the nuclear plants that use cooling ponds, lakes, or canals and that discharge to small rivers. These plants are all combined in the category of small river (average flow less than 2830 m³/s (100,000 ft³/s) in Tables 5.18 and 5.19. These issues were evaluated by reviewing what is known about the organisms that are potentially enhanced by operation of the steam-electric plants.

Because of the reported cases of fatal *Naegleria* infections associated with cooling towers, the distribution of these two pathogens in the power plant environs was studied in some detail (Tyndall et al. 1983; see also Appendix D). In response to these various studies (Appendix D), many electric utilities require respiratory protection for workers when cleaning cooling towers and condensers. However, no Occupational Safety and Health Administration (OSHA) or other legal standards for exposure to microorganisms exist at present. Also, for worker protection, one plant with high concentrations of *Naegleria fowleri* in the circulating water successfully controlled the pathogen through chlorination before its yearly downtime operation (Tyndall et al. 1983).

Changes in the microbial population and in the use of bodies of water may occur after the operating license is issued and the application for license renewal is filed. Ancillary factors may also change, including average temperature of water resulting from climatic conditions. Finally, the long-term presence of a power plant may change the natural dynamics of harmful microorganisms within a body of water by raising the level of *N. fowleri*, which are indigenous to the soils. Increased populations of *N. fowleri* may have significant adverse impacts. On entry into the nasal passage of a susceptible individual, *N. fowleri* will penetrate the nasal mucosa. The ensuing infection results in a rapidly fatal form of encephalitis. Fortunately, humans in general are resistant to infection with *N. fowleri*. Hallenbeck and Brenniman (1989) have estimated individual annual risks for

primary amebic meningoencephalitis caused by the free living *N. fowleri* to swimmers in fresh water, to be approximately 4×10^{-6} . Heavily used lakes and other fresh bodies of water may merit special attention and possibly routine monitoring for *N. fowleri*.

Thermophilic organisms may or may not be influenced by the operation of nuclear power plants. The issue is largely unstudied. However, NRC recognizes a potential health problem stemming from heated effluents. Occupational health questions are currently resolved using proven industrial hygiene principles to minimize worker exposures to these organisms in mists of cooling towers. NRC anticipates that all plants will continue to employ proven industrial hygiene principles so that adverse occupational health effects associated with microorganisms will be of small significance at all sites, and no mitigation measures beyond those implemented during the current term license would be warranted. Aside from continued application of accepted industrial hygiene procedures, no additional mitigation measures are expected to be warranted as a result of license renewal. This is a Category 1 issue.

Public health questions require additional consideration for the 25 plants using cooling ponds, lakes, canals, or small rivers (all under the small river category in Tables 5.18 and 5.19) because the operation of these plants may significantly enhance the presence of thermophilic organisms. The data for these sites are not now at hand and it is impossible to predict the level of thermophilic organism enhancement at any given site with current knowledge. Thus the impacts are not known and are site-specific. Therefore, the magnitude of the potential public health impacts associated with thermal enhancement of *N. fowleri* cannot be determined generically. This is a Category 2 issue.



Pennsylvania Department of Environmental Protection

909 Elmerton Avenue
Harrisburg, Pennsylvania 17110-8200
January 3, 2001

JAMES A. HUTTON
LICENSING SECTION

JAN 05 2001

REFER TO:

Southcentral Regional Office

717-705-4707
FAX 717-705-4760

Mr. James A. Hutton
PECO Energy Company
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3
Request for Information on Thermophilic Microorganisms

Dear Mr. Hutton:

I have reviewed your June 2, 2000 letter to Karen Bassett in which you requested information concerning monitoring studies for thermophilic bacteria in the Conowingo Pond in the vicinity of your Peach Bottom Atomic Power Station (PBAPS). Although water sampling of the Susquehanna River is routinely conducted by the Pennsylvania Department of Environmental Protection and the Susquehanna River Basin Commission for various inorganic parameters, neither agency has conducted sampling for thermophilic microorganisms. I have also been in contact with Mr. Dennis Wilson, Environmental Health Administrator with the PA Department of Health. He has basically stated that his agency has not been involved with such studies either. If you should need to contact Mr. Wilson his number is (717) 783-4790.

If you should have any questions please feel free to contact me at (717) 705-4764.

Sincerely yours,

Robert J. Schott
Senior Aquatic Biologist

cc: Karen Bassett
Dennis Wilson, PA Dept. of Health

