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U. S. Nuclear Regulatory Commission  
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**SUSQUEHANNA STEAM ELECTRIC STATION  
ANNUAL ENVIRONMENTAL OPERATING  
REPORT (NON-RADIOLOGICAL)  
PLA-5747**

**Docket Nos. 50-387  
and 50-388**

The Susquehanna SES Annual Environmental Operating Report (Non-radiological) is hereby submitted for the calendar year 2003 in accordance with the Environmental Protection Plan.

If you have any questions, please contact Mr. Rocco R. Sgarro at (610) 774-7552.

Sincerely,



B. L. Shriver

Attachments

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IE25



**Susquehanna Steam Electric Station  
Units 1 & 2**

**2003  
ANNUAL ENVIRONMENTAL OPERATING REPORT  
(NONRADIOLOGICAL)**



**PPL Susquehanna, LLC  
Berwick, PA  
April 2004**



**Susquehanna Steam Electric Station  
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**2003  
ANNUAL ENVIRONMENTAL OPERATING REPORT  
(NONRADIOLOGICAL)**

**Facility Operating License Nos. NPF-14 & NPF-22  
Docket Nos. 50-387 & 50-388**

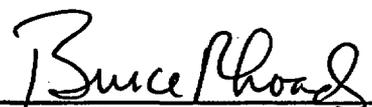
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Berwick, PA  
April 2004**

# SUSQUEHANNA STEAM ELECTRIC STATION

## ANNUAL ENVIRONMENTAL OPERATING REPORT (NONRADIOLOGICAL)

2003

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## **FOREWORD**

The Susquehanna Steam Electric Station (Susquehanna SES) consists of two boiling water reactors with design electrical ratings of 1150 megawatts electrical (MWE) net and 1220 MWE net for Units 1 and 2, respectively. The site consists of approximately 1,700 acres located in Salem Township, Luzerne County, Pennsylvania, approximately five miles northeast of Berwick, Pennsylvania. An additional 900 acres of PPL recreational land are located on the East Side of the Susquehanna River in Conyngham and Hollenback Townships. Under terms of an agreement finalized in January 1978, 90% of the Susquehanna SES is owned by PPL Susquehanna, LLC (Licensee) and 10% by the Allegheny Electric Cooperative, Inc.

This report discusses environmental commitments and impacts from January 1, 2003 through December 31, 2003. In summary it documents that environmental commitments were met and there was no significant adverse environmental impact from station operation.

## **1.0 OBJECTIVE**

The Licensee has developed procedures and guidelines to ensure that operation of Susquehanna SES does not adversely affect the environment in the vicinity of the station. Also, these procedures allocate responsibilities and define interfaces necessary to monitor environmental impacts. They include coordination of U.S. Nuclear Regulatory Commission (NRC) requirements with other federal, state, and local requirements for environmental protection.

The objective of this 2003 Annual Environmental Operating Report (Nonradiological) is to provide a summary of both environmental programs and procedures. This report is as required by the Final Environmental Statement (FES) for the operation of the Susquehanna SES, Unit 1 and 2, NUREG-0564, June 1981, and Appendix B - Environmental Protection Plan (EPP) to Operating Licenses, No. NPF-14 and No. NPF-22. The 2003 report is the 22nd Annual Environmental Operating Report (Nonradiological) submitted to meet EPP requirements.

The Licensee submitted an Environmental Report-Operating License Stage for Susquehanna SES to the NRC in May 1978. This report reviewed the results of the preoperational environmental programs and described the preoperational and proposed operational environmental monitoring programs. The NRC and other agencies reviewed this report and made recommendations for operational environmental monitoring programs which were listed in the FES.

## 2.0 ENVIRONMENTAL ISSUES

### 2.1 Aquatic Issues

The aquatic monitoring program for operation of the Susquehanna SES is divided into two parts. Part 1 includes effluent monitoring required by a National Pollutant Discharge Elimination System (NPDES) permit issued by the Pennsylvania Department of Environmental Protection (PaDEP). Monthly discharge monitoring reports are submitted to the PaDEP as part of the permitting requirements. The station's operational NPDES permit No. PA-0047325 was reissued on July 7, 2000, and expires on July 6, 2005. Part 2 of the aquatic monitoring program deals with programs listed in the FES or recommended by the PaDEP or U.S. Fish and Wildlife Service.

The PaDEP is responsible for regulating the water quality permit for the Susquehanna SES. The NPDES permit deals with discharge parameters for the Susquehanna SES Sewage Treatment Plant, Cooling Tower blowdown, and miscellaneous low volume waste discharges. The Cooling Tower blowdown also includes in-plant process streams which discharge to the Susquehanna River. Various low volume waste sumps discharge to the storm sewers which flow into Lake Took-a-while, and eventually into the Susquehanna River. NPDES permit limits were included in the 2000 Annual Report.

#### American Shad

The Susquehanna Anadromous Fish Restoration Committee continued to administer programs to restore American shad (*Alosa sapadissima*) to the Susquehanna River in 2003. The restoration program is a ongoing commitment to return shad and other migratory fishes to historic spawning and nursery waters above major dams in the Susquehanna River.

The spring of 2003 was characterized by relatively moderate river flows until early June when record setting precipitation began increasing river flows above normal for the remainder of the year. This year's shad run occurred prior to these high flows from 15 April to 2 June when 125,135 shad were captured in the East lift at the Conowingo Dam (Ref.2.1-1). This was 16% greater than last year's catch during a similar time period at high river flows. The greater catch is in keeping with the fact that more shad are captured in years of low river flows when attraction flow from the lift is most effective. Lifts at Holtwood, the next dam upriver, passed 25,254 shad, which was 20% of the shad passed at Conowingo. At the third dam upriver, Safe Harbor, 16,646 shad passed or two-thirds of the

Holtwood shad. Only 2,536 of the Safe Harbor shad continued through the fourth fishway at York Haven.

The Pennsylvania Fish and Boat Commission (PFBC) continued to operate their shad culture facility along the Juniata River at the Van Dyke Research Station, at Thompsettown, Pennsylvania. Throughout May, 33 million (M) shad eggs were delivered to the hatchery from the Hudson River (17.12M), Conowingo Dam (11.97M), Delaware River (3.61M), and Lower Susquehanna River (0.55M). These eggs yielded 12.74M fry, 84% of which were stocked in the Susquehanna River watershed. Although most fry were stocked in the lower Susquehanna and Juniata Rivers, three stockings occurred in the North Branch of the Susquehanna upriver from the Susquehanna SES: 800,000 fry about 50 miles upriver at Tunkhannock, Pennsylvania and a total of 907,000 fry about 150 miles upriver, in the Susquehanna and Chemung Rivers in New York.

The Susquehanna SES intake screens were monitored intermittently for impinged juvenile American shad from 18 August through 10 October 2003. On 8 September a shad species was found, but it was in poor condition and could not be positively identified as an American shad. In addition 13 other fish of 3 species (channel catfish, bluegill, and rock bass) and 19 crayfish were captured (Table 2.1-1).

#### Biofouling Mollusk Monitoring

The biofouling mollusk-monitoring program continued at the Susquehanna SES in 2003. Currently, the program involves biweekly artificial substrate inspections, both in the river and the Susquehanna SES River Intake Building, from May through November. Additionally, monthly inspections are made of both artificial substrates and the cement shoreline of the Emergency Service Water Spray Pond, as well as an annual scuba inspection of the pond. Finally, natural river substrates are normally examined as part of the program both near Susquehanna SES and at many sites ranging 40 miles above and below the plant. However, high water from summer through fall this year prevented the inspection of river substrates.

To date, no Zebra mussels or Asiatic clams have been found in the river near the Susquehanna SES. Zebra mussel young were observed during years past in the Johnson City, New York area, about 150 miles upriver. Asiatic clam adults have been observed in the river near Bloomsburg, Pennsylvania, approximately 18 miles downriver from Susquehanna SES. In 2001, a single Asiatic clam was collected from a heat exchanger within the plant, however since that time no additional Asiatic clams have been found.

## **2.2 Terrestrial Issues**

### **2.2.1 Studies Previously Completed**

Terrestrial environmental studies completed prior to 1989 included Cooling Tower bird impact and sound level surveys.

### **2.2.2 Sound Level Survey**

An increase in station power generation of 5% was completed during spring 1995. A power uprate sound level survey was conducted in June 1995.

### **2.2.3 Maintenance of Transmission Line Corridors**

Transmission line corridor vegetation maintenance and inspection records are maintained by the Asset Management Group of PPL Electric Utilities and are available upon request. There were no adverse environmental impacts to transmission corridors reported in 2003. Records will be maintained for five years.

## **2.3 Cultural Resources Issues**

Environmental Protection Plan actions required to satisfy Title 36, Code of Federal Regulations Part 800, relating to archeological sites, were completed in 1987. The Advisory Council on Historic Preservation (ACHP), in accordance with 36 CFR 800.6 (a)(1), approved the NRC's determination of "no adverse effect" for archeological sites SES-3, SES-6, SES-8, and SES-11 located on the Licensee's property (NRC letter dated October 28, 1987, to ACHP).

As part of the determination of effect process, the Licensee committed to and is taking appropriate measures to mitigate impacts from plant maintenance and operation to sites SES-3, SES-6, SES-8 and SES-11. There was no impact to these sites from plant maintenance and operation in 2003.

## **REFERENCES**

- 2.1-1 Restoration of American Shad to the Susquehanna River, Annual Progress Report-2003, Susquehanna River Anadromous Fish Restoration Committee, February 2004.

### **3.0 CONSISTENCY REQUIREMENTS**

#### **3.1 Plant Design and Operation**

In accordance with the Environmental Protection Plan (EPP), the Licensee shall prepare and record an environmental evaluation of proposed changes in plant design, operation, or performance of any test or experiment which may significantly affect the environment. Before initiating such activities, the Licensee shall provide a written evaluation and obtain prior approval from the Director, Office of Nuclear Reactor Regulation. Criteria for the need to perform an environmental evaluation include: (1) a significant increase in any adverse environmental impact previously evaluated by the NRC or Atomic Safety and Licensing Board, (2) a significant change in effluent or power level, or (3) a matter not previously evaluated which may have a significant adverse environmental impact.

The EPP requires that if an activity meets any of the criteria to perform an environmental evaluation, the NRC will be notified. If the change, test, or experiment does not meet any of these criteria, the Licensee will document the evaluation and allow the activity to occur.

During operation of the Susquehanna SES in 2003, there were seven proposed activities that the Licensee reviewed as part of the unreviewed environmental question program. None of these activities were determined to involve an unreviewed environmental question or require prior NRC notification. These activities were:

1. Replace damaged cement fiber Cooling Tower fill sheets with PVC fill material. It was determined this activity would not significantly affect the operating characteristics of the tower fill as it relates to the heat, noise or cooling water discharge resulting from Cooling Tower operation.
2. Evaluate internal discharge of Neutralization Basin #2 with a pH level of 10 to circulating water. Reviewed impacts on NPDES limits for Cooling Tower Blowdown and determined there would be no increase in impact previously evaluated and all NPDES permit limits would be met.

3. Reviewed Turbine Replacement Project for Unit 1 and Unit 2. Determined there would be a slight decrease in the heat load to the Cooling Towers due to the higher efficiency of the replacement turbines. Concluded project did not involve an unreviewed environmental question since there would be no significant change in quantity, quality or heat content of station discharges and power levels would remain within presently licensed operating limits.
4. Replacement of Startup Transformer T-10 was reviewed and a determination made that this activity would not increase the environmental impact previously evaluated since it was essentially a like kind replacement and appropriate oil spill prevention, control and countermeasure plans would be implemented during the changeout.
5. Replacement of Unit 1 Main Step up Transformers 1X101 and 1X102 was reviewed and a determination made that this activity would not result in an increase in environmental impact previously evaluated and that appropriate oil spill prevention, control and countermeasure plans would be implemented during the changeout.
6. Use of Rhodamine Dye for circulating water flow testing was evaluated and determined to be acceptable under the PaDEP NPDES permit, however an alternative of using ultrasonic flow instrumentation was implemented in lieu of using Rhodamine Dye.
7. Evaluate Circulating Water Pump impeller replacement for Unit 1 and Unit 2. A review was completed and a determination made that there would be no significant change in heat load, evaporation rate or offsite operational noise level as a result of this activity.

### **3.2 Reporting Related to NPDES Permits and State Certifications**

**There was one NPDES permit noncompliant sampling event in 2003.**

**On August 13, 2003 a total suspended solids excursion (191.1 mg/L) occurred at the circulating water pumphouse sump (internal outfall 571) due to elevated Susquehanna River turbidity from significant rainfall events. Although there are no solids limits on circulating water (cooling water) a given amount of circulating water typically leaks through the circulating water pump seals contributing to sump solids levels whenever river solids are elevated. Additional sump samples collected by the end of the month resulted in the monthly average permit limit for this internal outfall being met.**

**A project to replace the Circulating Water Pump Impellers, including the seals, was approved and when installed should help mitigate this situation. A revised description of this outfall will be provided during the next NPDES permit renewal to more accurately describe this discharge and provide justification for requesting elimination of this monthly monitoring requirement.**

**The 2002 Annual Report provided a description of an environmental evaluation completed for oil accumulation around the turbine lube oil system roof vents. The PaDEP was provided with information on this additional source of oil to stormwater outfall 075. In December 2003 corrective action was taken to install collective measures on the Unit 1 and Unit 2 roofs to eliminate the small amount of entrained oil from the discharge. Environmental remediation activities are planned to mitigate the affects of this occurrence. The NRC site inspector has been updated on this condition and the corrective actions taken to address it.**

**Pennsylvania is an NPDES Permitting Agreement State with the U.S. Environmental Protection Agency; therefore, state certification pursuant to Section 401 of the Clean Water Act is not required.**

**3.3 Changes Required for Compliance with Other Environmental Regulations**

Authorization was received from the Army Corps of Engineers to allow maintenance dredging in front of the river Intake Structure and inside the discharge diffuser in compliance with the Pennsylvania State Programmatic General Permit (PASPGP-2).

<u>PERMIT</u>	<u>NO.</u>
Maintenance Dredging, River Intake And Discharge Diffuser (January 23, 2003)	CENAB-OP-RPA 200300823-13

A state only air operating permit was issued for the Emergency, Security, Fire Pump and Standby Diesels and also for operation of miscellaneous air pollution equipment such as the sand blast/paint spray facility and parts cleaning equipment.

<u>PERMIT</u>	<u>NO.</u>
"A-D" Emergency Diesel Generators "E" Emergency Diesel Generator Security, Fire Pump and Standby Diesels Operation of Sand Blasting/Parts Cleaning Equipment	SM 40-00027 (November 19, 2003)

Pennsylvania Department of Environmental Protection provided Final Closure Certification for Solid Waste Disposal Site #3, last used under a construction/demolition permit for disposal of Cooling Tower Sediment 10 years ago.

<u>PERMIT</u>	<u>NO.</u>
Solid Waste Disposal Site #3 Final Closure Certification	I.D. #10163 (December 2, 2003)

## **4.0 ENVIRONMENTAL CONDITIONS**

### **4.1 Unusual or Important Environmental Events**

During 2003, two operating occurrences were reviewed as part of the significant environmental event evaluation program. There were no significant or adverse environmental effects caused by these occurrences. There were no EPP noncompliances.

The two operating occurrences were as follows:

1. On January 5, 2003 twenty-nine Canadian Pacific (CP) rail cars derailed along the Eastern Shore of the Susquehanna River across from SSES. Twenty of the cars contained Liquid Clay Slurry; the other nine cars contained Powdered Clay. The CP representative on scene indicated to PPL that two of the cars containing liquid slurry had leaked, along with a few of the cars containing clay powder. The actual derailment did not occur on PPL property and the event occurred downstream and across the river. This event was unrelated and had no affect on SSES operation.
  
2. On April 25, 2003 a mature male Bald Eagle was found floating in the Susquehanna River by a boater on the opposite shore from SSES. A necropsy performed concluded the bird died of congestive heart failure with possible secondary trauma from electrocution. According to information provided during the evaluation it appeared if an electrocution did occur it was more likely from a low voltage source, possibly distribution network up-river, and may have been related to the pre-existing poor condition of the bird. Numerous Bald Eagles sightings have occurred along the river both before and after this event including observations of a healthy pair reported to be frequenting the area. The conclusion was this event was not causally related to station operation. However, it is indicative of the increasing population of Bald Eagles in Pennsylvania and along the Susquehanna River due to the availability of preferred habitat.

**4.2 Environmental Monitoring**

**4.2.1 General Monitoring**

With the exception of aquatic monitoring discussed in Section 2.1 of this report, all other monitoring of station operational impacts on aquatic and terrestrial biota listed in the FES and Appendix B of the operating license has been completed.

**4.2.2 Maintenance of Transmission Line Corridors**

In 2003, the Asset Management group of PPL Electric Utilities maintained transmission line vegetation maintenance and inspection records.

## **5.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS**

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### **5.1 Review and Audit**

The Licensee has established procedures for an independent group to review and audit compliance with the EPP. Audits of EPP compliance are conducted by Quality Assurance. The Manager-Quality Assurance is responsible for verifying compliance with the EPP. The Vice President-Nuclear Operations is responsible for environmental monitoring and for providing any related support concerning licensing. The Manager – Plant Chemistry is responsible for day-to-day offsite monitoring. The Auditing Organization Chart (Fig. 5.1-1) lists the groups utilized in environmental reviewing and auditing of the Susquehanna SES environmental monitoring programs as well as those responsible for managing these programs. The Manager-Environmental Management Department is also available to provide auditing support, as needed.

There are periodic audits of the EPP program. An audit of the EPP was conducted in 2003 as part of a Chemistry Program Audit. There were no findings or recommendations reported as a result of this audit of the EPP.

### **5.2 Records Retention**

Records and logs relative to environmental aspects of plant operation and audit activities are retained in the Nuclear Records System. This system provides for a convenient review and inspection of environmental documents which are available to the NRC upon request.

All records concerning modifications of plant structures, systems and components which are determined to potentially affect the continued protection of the environment, are retained for the life of the plant. All other records, data, and logs relating to the environmental programs and monitoring are retained for at least five years or, where applicable, in accordance with the requirements of other agencies.

### **5.3 Changes in Environmental Protection Plan**

No changes were made to the EPP during 2003.

## **5.4 Plant Reporting Requirements**

### **5.4.1 Routine Reports**

This Annual Environmental Operating Report (Nonradiological) was prepared to meet routine reporting requirements of the EPP for 2003. It provides summaries and analyses of environmental protection activities required in Subsection 4.2 of the EPP for the reporting period.

### **5.4.2 Nonroutine Reports**

There were no unusual or Important Environmental Events as identified in the Environmental Protection Plan that required reporting in 2003.

## **6.0 ATTACHMENTS**

**Table 2.1-1**

**2003 Shad Impingement Monitoring Program**

**Figure 5.1-1**

**Auditing Organization Chart (2003)**

**TABLE 2.1-1  
2003 SHAD IMPINGEMENT PROGRAM**

Date	Time	Items Found on Trash Bar/Traveling Screen		
		Shad	Fish	Other
2003				
18 Aug	1400	Nets set to begin sampling.		
19 Aug	1430	0	1 bluegill	0
20 Aug	1330	0	3 bluegill, 1 rock bass	0
21 Aug	1330	0	1 bluegill	0
22 Aug	1400	0	0	0
23 Aug	No monitoring performed.			
24 Aug	No monitoring performed.			
25 Aug	1040	0	1 rock bass	0
26 Aug	1430	Upon arrival, trash basin overflowing. Condition reported to Unit 1 Control Room. Mechanical Maintenance found thermal switch in traveling bars turned off. Traveling bars were restored to operating condition. Debris was removed and water level returned to normal. No fish found.		
27 Aug	1330	0	0	0
28 Aug	No monitoring performed.			
29 Aug	0900	0	0	0
30 Aug	No monitoring performed.			
31 Aug	No monitoring performed.			
1 Sep	No monitoring performed.			
2 Sep	1400	0	0	7 crayfish
3 Sep	No monitoring performed.			
4 Sep	1400	0	0	2 crayfish
5 Sep	No monitoring performed.			
6 Sep	1130	0	0	0
7 Sep	No monitoring performed.			
8 Sep	1430	1*	0	0
9 Sep	1500	0	0	0
10 Sep	No monitoring performed.			
11 Sep	1500	0	0	0
12 Sep	No monitoring performed.			
13 Sep	1300	0	0	1 crayfish
14 Sep	No monitoring performed.			
15 Sep	1400	0	0	0
16 Sep	1400	0	0	0
17 Sep	1430	0	3 channel catfish	0
18 Sep	1430	0	0	0

**TABLE 2.1-1 (continued)**

Date		Time		Items Found on Trash Bar/Traveling Screen		
2003		Shad	Fish		Other	
19 Sep	1330	0	0		0	
19 Sep	Nets were not reset due to Tropical Storm Isabel.					
20 Sep	No monitoring performed.					
21 Sep	No monitoring performed.					
22 Sep	1230	Upon resetting nets, water level in trash basin very high and traveling screens inoperative. Unit 2 Control Room stated that Maintenance had an ongoing Work Order and traveling screens will be inoperable until 25 September				
23 Sep						
24 Sep						
25 Sep	1445	Nets reset				
26 Sep	1330	0	0		1 crayfish	
27 Sep	1100	0	1 channel catfish		2 crayfish	
28 Sep	No monitoring performed.					
29 Sep	No monitoring performed.					
30 Sep	1000	0	0		1 crayfish	
1 Oct	No monitoring performed.					
2 Oct	1500	0	1 channel catfish		1 crayfish	
3 Oct	1330	0	0		1 crayfish	
4 Oct	1130	0	1 channel catfish		0	
5 Oct	No monitoring performed					
6 Oct	1400	0	0		3 crayfish	
7 Oct	No monitoring performed.					
8 Oct	No monitoring performed.					
9 Oct	0900	0	0		0	
10 Oct	1400	0	0		0	
TOTAL		1*	13 fish – 3 species 6 channel catfish 5 bluegill 2 rock bass		19 crayfish	

\*Positive identification not possible due to condition of fish (dorsal fin missing, head and tail mangled).

**FIGURE 5.1-1**  
**AUDITING ORGANIZATION CHART.**  
**(2003)**

