

Kevin Cimorelli
Site Vice President

Susquehanna Nuclear, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570.542.3795 Fax 570.542.1504
Kevin.Cimorelli@TalenEnergy.com



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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.4

**SUSQUEHANNA STEAM ELECTRIC STATION
2019 ANNUAL ENVIRONMENTAL OPERATING REPORT
(NONRADIOLOGICAL)
PLA-7854**

**Docket No. 50-387
and No. 50-388**

The Susquehanna Steam Electric Station (SSES) Annual Environmental Operating Report (Nonradiological) is hereby submitted for the calendar year 2019 in accordance with the SSES Environmental Protection Plan, Section 5.4.1.

There are no new or revised regulatory commitments contained in this submittal.

Should you have any questions regarding this submittal, please contact Ms. Melisa Krick, Manager – Nuclear Regulatory Affairs, at (570) 542-1818.

A handwritten signature in black ink, appearing to be "K. Cimorelli", written in a cursive style.

Kevin Cimorelli

Attachment: 2019 Annual Environmental Operating Report (Nonradiological)

Copy: NRC Region I
Ms. S. Goetz, NRC Project Manager
Ms. L. H. Micewski, NRC Sr. Resident Inspector
Mr. M. Shields, PA DEP/BRP
Mr. R. Anderson, US Department of Interior, Fish and Wildlife Service

Attachment to PLA-7854

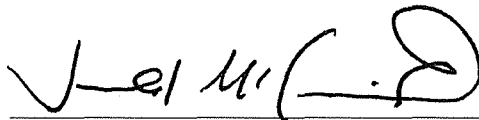
**2019 Annual Environmental Operating Report
(Nonradiological)**

SUSQUEHANNA STEAM ELECTRIC STATION

ANNUAL ENVIRONMENTAL OPERATING REPORT (NONRADIOLOGICAL)

2019

Prepared by:

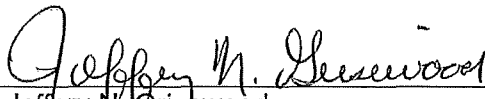


Jerrold L. McCormick
Sr. Environmental Scientist - Nuclear

Date:

3/16/20

Reviewed by:



Jeffery M. Grisewood
Manager – Plant Chemistry / Environmental

Date:

3/18/20

Approved by:



Derek Jones
Plant General Manager – Nuclear

Date:

3/23/2020



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

**2019
ANNUAL ENVIRONMENTAL OPERATING REPORT
(NONRADIOLOGICAL)**

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

**Prepared by
Chemistry – Environmental Services
Susquehanna Nuclear, LLC
Berwick, PA
April 2020**

FOREWORD

The Susquehanna Steam Electric Station is a nuclear electrical generating facility with two boiling-water reactors and generators located just west of the Susquehanna River, approximately 5 miles northeast of Berwick, in Luzerne County, Pennsylvania. The station was constructed in the 1970's, with Unit 1 beginning commercial operation on June 8, 1983, and Unit 2 beginning commercial operation on February 12, 1985. Units 1 and 2 each generate a net 1,350 megawatts (MWe), for a total station output of 2,700 MWe.

In total Susquehanna Nuclear, LLC presently owns 2,347 acres of land on both sides of the Susquehanna River. Generally, this land is characterized by open deciduous woodlands interspersed with grasslands and orchards.

On the west side of the river, 1,605 (1670 minus 65 acre Gould Island) acres of land is jointly owned between Susquehanna Nuclear, LLC (90%) and Allegheny Electric Cooperative (10%). The land uses on the west side of the river include generation & associated maintenance facilities, laydown areas, parking lots, roads, a nature preserve (the Susquehanna Riverlands), and agricultural leases to local farmers.

To the north of the station along the river, Susquehanna Nuclear, LLC owns 100% of the 65-acre Gould Island. On the east side of the river, and across the river from the station, Susquehanna Nuclear, LLC is the 100% owner of 677 acres that are maintained as undeveloped land, natural recreational areas, wildlife areas, and leases to local farmers.

This report discusses environmental commitments and impacts from January 1, 2019 through December 31, 2019. In summary, the report documents that Susquehanna Nuclear's environmental commitments were met and that there was no significant adverse environmental impact from station operation.

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1.0 OBJECTIVE

The Licensee has developed procedures and guidelines to ensure that operation of Susquehanna Steam Electric Station (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 2019 Annual Environmental Operating Report (Nonradiological) is to provide a summary of both environmental programs and procedures. This report is 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 2019 report is the 38th 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).

The PaDEP is responsible for regulating the water quality permit for the Susquehanna SES. The station's operational NPDES Permit No. PA-0047325 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 station's stormwater system, which flows into Lake Took-a-while, and eventually into the Susquehanna River. The permit requires the station to submit monthly Discharge Monitoring Reports for these outfalls to the PaDEP.

Susquehanna SES's NPDES Permit was reissued on September 1, 2011, and expired on August 31, 2016. The station submitted its NPDES Permit renewal application (PLE-025782) to PaDEP on February 9, 2016. PaDEP has since confirmed that the submitted renewal application was administratively complete, but has not yet provided the station a new NPDES Permit. Until a new permit is issued to the station, the conditions of the most recently expired NPDES Permit will apply.

NOTE: A copy of the NPDES Permit renewal application (PLE-025782) was provided to the NRC in 2016 as part of the submittal process.

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.

American Shad

Environmental lab personnel sampled the wash-water from the trash bars and traveling screens at the intake building during September, October, and November to see if any shad migrating downriver were impinged by the Susquehanna SES.

Fish sampling containers, made from aluminum-framed boxes sided with wire mesh, were suspended by jib cranes at the ends of each of the wash-water canals from the trash bars and traveling screens. The sampling containers were deployed from September 4 through October 16, and from October 31 through November 11, 2019, and checked daily (Monday-Friday). No American shad were collected during this period or

during any previous sampling year. However, 123 fish of 16 other species were collected (Table 2.1-1). Most of these fish were juvenile channel catfish and bluegills (*Ictalurus punctatus*, 53 specimens, and *Lepomis macrochirus*, 27 specimens, respectively). Additionally, five juvenile flathead catfish (*Pylodictis olivaris*) were collected for the first time in the boxes.

Biofouling Mollusk Monitoring

The biofouling mollusk monitoring program continued at the Susquehanna SES in 2019. The purpose of this monitoring is to survey the Susquehanna River and the ESSW Spray Pond for the presence of live Asian clams (*Corbicula fluminea*) and zebra mussels (*Dreissena polymorpha*) that could affect the operation of Susquehanna Nuclear LLC. This monitoring is generally performed through a combination of scuba diving, wading, and examination of natural or artificial substrates in the river and the Emergency Service Water Spray Pond.

Asian clams are now abundant in the Susquehanna River near the Susquehanna SES, and zebra mussels are also abundant in Lake Took-a-while, a 24-acre recreational lake owned by Talen Energy. The lake drains to the Susquehanna River through a remnant of the North Branch Canal, and presents a pathway for zebra mussel introduction to the river. As a result, this area has been monitored closely since zebra mussels were discovered in Lake Took-a-while in 2016. Three adult mussels were observed in the outfall area of the river in 2017, but no specimens were found in 2019. At this time there is no evidence of a reproductive population of zebra mussels in the Susquehanna River near Susquehanna Nuclear LLC.

A scuba inspection for biofoulers in the ESSW Spray Pond was done on June 17, 2019, by divers from the environmental laboratory, and 24 zebra mussel specimens were collected during that inspection. Four of the spray pond pump house screens were removed in October for cleaning and examined for biofoulers; 296 live zebra mussels and 15 Asian clams were found attached to the screens. The spray pond is scheduled for treatment with a biocide in 2020 to control the biofouling mollusks.

2.2 Terrestrial Issues

2.2.1 Studies Previously Completed

Terrestrial environmental studies, including Cooling Tower Bird Impaction, were completed prior to 1989.

2.2.2 Sound Level Survey

Sound level surveys were conducted during pre-operation and operational periods and are completed. No noise complaints due to station operation received during 2019.

2.2.3 Maintenance of Transmission Line Corridors

Transmission line corridor vegetation maintenance and inspection records are maintained by PPL-Electric Utilities Vegetation Management and are available upon request. There were no adverse environmental impacts to transmission corridors reported in 2019. 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 (36LU15), SES-6 (36LU16), SES-8 (36LU49), and SES-11 (36LU51) 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 station maintenance and operation to sites 36LU15, 36LU16, 36LU49, 36LU51, 36LU43, and 36LU105. There was no impact to these sites from station maintenance and operation in 2019. Furthermore, station activities did not impact any previously unknown cultural resources in 2019.

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 an environmental evaluation be completed and the NRC be notified if an activity meets any of the criteria. 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 2019, there were 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. The activities reviewed were:

1. Excavations to support Cathodic Protection System Enhancement Project
2. Replace SUB5D Disconnect (0DS540) and repair storm water drainage
3. 2019 Stormwater System Maintenance
4. Excavation of Bore Holes to support T-21 Transformer Transport
5. Removal of Rock Pigeon Nest from T-10 Transformer
6. PPL Excavation Work; 500kV and T-10 Yards

3.2 Reporting Related to NPDES Permits and State Certifications

There were no significant non-compliances or special reporting requirements associated with implementation of NPDES Permit No. PA0047325.

Since Susquehanna SES has an NPDES permit, state certification pursuant to Section 401 of the Clean Water Act is not required.

3.3 Changes Required for Compliance with Other Environmental Regulations

The following regulatory changes were incorporated into Susquehanna SES's nonradiological environmental compliance program in 2019:

- PaDEP's amendments to 25 Pa. Code Chapter 245, Administration of the Storage Tanks and Spill Prevention Program.
- PaDEP's Disinfection Requirements Rule (DRR) for Public Water Systems.
- USEPA's Section 608 Refrigerant Management Regulations update.
-

4.0 ENVIRONMENTAL CONDITIONS

4.1 Unusual or Important Environmental Events

During 2019 there were no operating occurrences requiring review as part of the Significant Environmental Event evaluation program. There were no significant or adverse environmental effects related to station operation, and there were no EPP non-compliances.

4.2 Environmental Monitoring

4.2.1 General Monitoring

With the exception of ongoing water quality monitoring required for compliance with the NPDES permit, all monitoring of station operational impacts on aquatic and terrestrial biota listed in the FES and Appendix B of the operating license have been completed.

4.2.2 Maintenance of Transmission Line Corridors

In 2019, PPL Electric Utilities Vegetation Management maintained transmission line vegetation maintenance and inspection records.

5.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS

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 Nuclear Oversight. The Manager-Nuclear Oversight is responsible for verifying compliance with the EPP. The Site VP – Susquehanna is responsible for environmental monitoring and for providing any related support concerning licensing. The Manager – Plant Chemistry / Environmental is responsible for day-to-day environmental monitoring.

The Auditing Organization Chart (Fig. 5.1-1) lists the groups utilized in reviewing and auditing of the Susquehanna SES environmental programs as well as those responsible for managing these programs.

An audit of compliance with the EPP program was conducted during 2018 as part of a regularly scheduled Chemistry Program Audit. The next Chemistry Program Audit is currently scheduled to be conducted in 2020.

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 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. Transmission line corridor vegetation maintenance records are maintained by PPL Electrical Utilities per section 2.2.3 of this report.

5.3 Changes in Environmental Protection Plan

No changes were made to the EPP during 2019.

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 2019. It provides summaries and analyses of environmental protection activities required in Subsection 4.2 of the EPP for the reporting period.

5.4.2 Non-routine Reports

There were no Unusual or Important Environmental Events as defined by the Environmental Protection Plan that required reporting in 2019.

6.0 ATTACHMENTS

Table 2.1-1

American Shad Impingement Monitoring (2019)

Figure 5.1-1

Auditing Organization Chart (2019)

TABLE 2.1-1

**SUSQUEHANNA STEAM ELECTRIC STATION
2019 AMERICAN SHAD IMPINGEMENT PROGRAM
04 September – 11 November 2019**

Date	Time	Items Found on Trash Bar/Traveling Screen				
2019		Shad	Fish	Crayfish	Other	Comments
Fish baskets were deployed on 04 Sep @ 1100.						
04 Sep	1515	0	1 channel catfish	0	0	Light leaves/debris
05 Sep	1745	0	3 channel catfish 1 margined madtom	2	0	Moderate leaves/debris
06 Sep	1445	0	3 channel catfish 1 spottail shiner	1	0	Moderate leaves/debris
09 Sep	1630	0	3 channel catfish	0	0	Light leaves/debris
10 Sep	1600	0	5 channel catfish	0	0	Light leaves/debris
11 Sep	1330	0	5 channel catfish 1 bluegill	0	0	Light leaves/debris
12 Sep	1400	0	5 channel catfish 1 margined madtom 1 rockbass	1	0	Light leaves/debris
13 Sep	1330	0	4 channel catfish	1	0	Moderate leaves/debris
16 Sep	1700	0	2 channel catfish 1 rockbass 1 smallmouth bass	0	0	Light leaves/debris
17 Sep	1430	0	2 channel catfish	0	0	Light leaves/debris
18 Sep	1200	0	3 channel catfish	1	0	Light leaves/debris
19 Sep	1530	0	4 channel catfish	0	0	Moderate leaves/debris
20 Sep	1400	0	0	0	0	Moderate leaves/debris
23 Sep	1345	0	0	0	0	Light leaves/debris
24 Sep	1500	0	2 channel catfish	0	0	Heavy leaves/debris
25 Sep	1500	0	1 shorthead redhorse	0	0	Heavy leaves/debris
26 Sep	1500	0	0	0	0	Moderate leaves/debris
27 Sep	1530	0	0	1	0	Moderate leaves/debris

TABLE 2.1-1 (cont.)

Date	Time	Items Found on Trash Bar/Traveling Screen				
2019		Shad	Fish	Crayfish	Other	Comments
30 Sep	1515	0	0	0	0	Light leaves/debris
01 Oct	1300	0	2 channel catfish	1	0	Moderate leaves/debris
02 Oct	1430	0	1 channel catfish	0	0	Moderate leaves/debris
03 Oct	1500	0	0	0	0	Heavy leaves/debris
04 Oct	1430	0	0	0	0	Heavy leaves/debris
07 Oct	1430	0	1 channel catfish	1	0	Heavy leaves/debris
08 Oct	1630	0	0	0	0	Heavy leaves/debris
09 Oct	1430	0	0	0	0	Very heavy leaves/debris
10 Oct	1700	0	0	1	1 hellgrammite	Very heavy leaves/debris
11 Oct	1300	0	11 bluegill 3 rockbass 1 channel catfish	0	0	Very heavy leaves/debris
14 Oct	1430	0	0	0	0	Moderate leaves/debris
15 Oct	1430	0	1 rockbass	0	0	Heavy leaves/debris
16 Oct	1300	0	2 rockbass	0	0	Heavy leaves/debris
Small traveling screen for the wash-water well broke. Maintenance personnel drained the well and worked on the screen for 10 days. It was brought back to service on 30 Oct @ 0900.						
31 Oct	1430	0	0	0	0	Very heavy leaves/debris
01 Nov	1400	0	0	0	0	Very heavy leaves/debris
02 Nov	1000	0	0	0	1 hellgrammite	Very heavy leaves/debris
04 Nov	1000	0	0	0	0	Very heavy leaves/debris
05 Nov	1800	0	0	0	0	Moderate leaves/debris
06 Nov	1000	0	4 margined madtom 4 green sunfish 3 channel catfish 2 rockbass 2 bluegills 1 bluntnose minnow 1 yellow bullhead 1 flathead catfish	1	0	Moderate leaves/debris

Date	Time	Items Found on Trash Bar/Traveling Screen				
2019		Shad	Fish	Crayfish	Other	Comments
07 Nov	1830	0	2 flathead catfish 2 tessellated darters 1 greenside darter 1 pumpkinseed	2	1 Chinese mystery snail	Heavy leaves/debris
08 Nov	1000	0	2 bluegill 1 margined madtom 1 flathead catfish 1 channel catfish 1 rockbass 1 comely shiner	1	0	Very heavy leaves/debris
09 Nov	1430	0	4 bluegill 1 rockbass 1 channel catfish 1 redbreast sunfish 1 flathead catfish	0	0	Heavy leaves/debris
10 Nov	1600	0	3 bluegill 2 rockbass 1 green sunfish 1 channel catfish	0	0	Heavy leaves/debris
11 Nov	0830	0	4 bluegill 1 green sunfish	0	0	Very heavy leaves/debris
Baskets withdrawn on 11 Nov @ 0830; 2019 American Shad Impingement monitoring complete.						

Date	Time	Items Found on Trash Bar/Traveling Screen				
2019		Shad	Fish	Crayfish	Other	Comments
TOTALS		0	123 fish - 16 species	14*	3	
			53 channel catfish 27 bluegill 14 rockbass 7 margined madtoms 6 green sunfish 5 flathead catfish 2 tesselated darter 1 spottail shiner 1 smallmouth bass 1 shorthead redhorse 1 bluntnose minnow 1 yellow bullhead 1 greenside darter 1 pumpkinseed 1 comely shiner 1 redbreast sunfish		1 Chinese mystery snail 2 hellgrammites	

*All crayfish collected were *Faxonius obscurus*.

FIGURE 5.1-1 AUDITING ORGANIZATIONAL CHART (2019)

