PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

PSEG
Nuclear LLC

OCT 0 3 2005

LR-E05-0486

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
ARTICLE NUMBER: 7004 2510 0005 2135 8506

Carol R. Collier
Executing Director
Delaware River Basin Commission
P.O. Box 7360
25 State Police Drive
West Trenton, NJ 08628-0360

PSEG NUCLEAR LLC
POLLUTION MINIMIZATION PLAN FOR POLYCHLORINATED BIPHENYLS FOR THE SALEM & HOPE CREEK GENERATING STATION

Dear Ms. Collier:

PSEG Nuclear submits the enclosed document titled Salem Generating Station and Hope Creek Generating Station Pollution Minimization Plan for Polychlorinated Biphenyls in the Delaware Estuary (the "PMP"), October 2005. This PMP is being submitted pursuant to Section 4.30.9 of the Delaware River Basin Commission's *Water Quality Regulations* and *Water Code*. Specifically, on July 5, 2005. Mr. Russell J. Furnari with PSEG Services Corporation received a letter from you, dated June 30, 2005, requiring Salem Generating Station and Hope Creek Generating Station to submit pollutant minimization plans.

PSEG Nuclear LLC has developed a comprehensive *Discharge Prevention and Response Program* for the Salem Generating Station and Hope Creek Generating Station. The DPRP incorporates the requirements of the NJDEP *Discharge Prevention, Containment, and Countermeasure/Discharge Cleanup and Removal (DPCC/DCR) Plans*, the USEPA *Facility Response Plan (FRP), Spill Prevention, Control, and Countermeasure (SPCC) Plan*, and *Hazardous Waste Contingency Plan (HWCP)*, and the National Oceanic and Atmospheric Administration (NOAA) *Natural Resource Damage Assessment (NRDA) Protocol*. Consistent with this approach, PSEG Nuclear is submitting a single PMP for the two facilities.

IE25

Should you have any questions or require additional info, please contact Russell J. Furnari (973) 430-8848 or Clifton Gibson of my staff at (856) 339-2686.

Sincerely,

Darin M Benyak

Darin Benyak
Director – Regulatory Assurance

CC:
Susan Rosenwinkel
New Jersey Department of Environmental Protection
Division of Water Quality
P.O. Box 029
Trenton, NJ 08625-0029

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

SALEM GENERATING STATION AND HOPE CREEK GENERATING STATION POLLUTION MINIMIZATION PLAN FOR POLYCHLORINATED BIPHENYLS IN THE DELAWARE ESTUARY

PSEG NUCLEAR LLC

October 2005

TABLE OF CONTENTS

1 Good Faith Commitment

Rule Section 40.3.9.E.1

PSEG Nuclear, LLC (PSEG Nuclear) makes a good faith commitment to implement the Pollutant Minimization Plan ("PMP") as outlined herein. If the results of implementation indicated that either Salem Generating Station ("SGS") or Hope Creek Generating Station ("HCGS"), is a source of Polychlorinated Biphenyls (PCBs), to the Delaware Estuary, then PSEG Nuclear will make a good faith commitment to reduce discharges of PCBs through the PMP process in accordance with the Delaware River Basin Commission ("DRBC") PMP Rule 4.30.9.

9/27/05	
Thomas Joyce - Salem Site Vice President	**Date**
10/2/05	
George Barnes - Hope Creek Site Vice President	**Date**

2 Discharger / Facility Contact

Rule Section 40.3.9.E.2

Salem Facility Contact:	Chemistry – Radwaste, Environmental Supervisor
Phone Number:	(856) 339-1169
Telefacsimile Number:	(856) 339-2819

Hope Creek Facility Contact:	Chemistry – Radwaste, Environmental Supervisor
Phone Number:	(856) 339-2628
Telefacsimile Number:	(856) 339-3546

2.1 PCB Pollutant Minimization Plan Implementation Team

The **PCB Pollutant Minimization Plan** (PMP) will be implemented and maintained by individuals currently involved in the management of other NJPDES and pollution prevention activities at the facility. Various station personnel as described in Part III, Section 2, Discharge Response Personnel, of the *Discharge Prevention and Response Program* ("DPRP"), may implement various parts of the PMP depending on the nature of the need.

The principal members and their associated responsibilities are as follows:

1. **<u>Chemistry - Radwaste and Environmental Supervisor</u>**
   The Salem and Hope Creek Chemistry groups maintain day-to-day responsibility for the oversight of the NJPDES permit. In addition, the Chemistry Department will coordinate inspections, preventive maintenance and good housekeeping are conducted as outlined in the PMP. The Chemistry Department will also provide expert assistance in developing policies and the Best Management Practices (BMPs) for implementation of the PMP, ensures that applicable reports required by the PMP are submitted, and has overall responsibility for the PMP enforcement, implementation, maintenance, and team management.

2. **<u>Chemistry Program Supervisor - NJPDES</u>**
   The Chemistry Departments provide day-to-day oversight of the NJPDES Compliance Program under the authority of the Operations Manager and Chemistry, Radwaste and Environmental Manager. Chemistry performs daily walk downs of their systems.

3. **<u>PSEG Nuclear LLC Design Engineering – Mechanical/Structural</u>**
   PSEG Nuclear LLC's design engineering organizations provide support for the proper evaluation of facility structural controls. This representative performs annual inspections for integrity.

4. **<u>PSEG Nuclear LLC Maintenance</u>**
   PSEG Nuclear LLC's Maintenance organizations provide support for the proper evaluation of facility maintenance and housekeeping. This organization also performs weekly inspections.

2.2 Discharge Prevention and Response Program

As noted in Section 2.1, PSEG Nuclear LLC has developed a comprehensive *Discharge Prevention and Response Program* for the SGS and HCGS (PSEG Nuclear LLC, 2005a, 2005b). The DPRP incorporates the requirements of the NJDEP *Discharge Prevention, Containment, and Countermeasure/Discharge Cleanup and Removal (DPCC/DCR) Plans,* the USEPA *Facility Response Plan (FRP), Spill Prevention, Control, and Countermeasure (SPCC) Plan,* and *Hazardous Waste Contingency Plan (HWCP),* and the National Oceanic and Atmospheric Administration (NOAA) *Natural Resource Damage Assessment (NRDA) Protocol.* A copy of the DPRP is maintained and available for review at the facility. The specific actions identified in the DPRP will supplement the actions proposed in this PMP.

3 Facility Description

Rule Section 40.3.9.E.3

This PMP has been developed for SGS and HCGS. SGC and HCGS are steam-electric nuclear power plants that use nuclear fuel to generate electrical energy. SGS has a net-rated capacity of 2,384 megawatts-electric (Mwe). HCGS has a net-rated capacity of 1139 Mwe. The Standard Industrial Classification (SIC) Code for the two stations is 4,911; the North American Industrial Classification System (NAICS) Code for the two stations is 221113.

SGS is co-owned by PSEG Nuclear LLC and Exelon (formerly PECO) and is operated by PSEG Nuclear LLC. Exelon also provides management services for plant operations pursuant to an agreement between PSEG Nuclear and Exelon. PSEG Nuclear LLC owns 57.41percent and Exelon own 42.59 percent of SGS. HCGS is owned and operated by PSEG Nuclear LLC. The corporate offices of PSEG Nuclear LLC are located at:

> 80 Park Plaza
> Newark, New Jersey 07101
> (973) 430-7000

The corporate offices of Exelon are located at:

> 37th Floor, 10 South Dearborn Street
> P.O. Box 805398
> Chicago, Illinois 60680-5398
> (800) 483-3220

SGS and HCGS are located in the southern region of the Delaware River Valley on Artificial Island in Lower Alloways Creek Township, Salem County, New Jersey (**See Figure 1**). Artificial Island is on the east shore of Delaware Bay at approximately River Mile 50 (River Mile "0" is at the mouth of the Delaware Bay with River Miles increasing upstream). The two stations are approximately 18 miles south of Wilmington, Delaware, 30 miles southwest of Philadelphia, Pennsylvania, and 7.5 miles southwest of Salem, New Jersey. Additional information for locating and contacting SGC and HCGS is:

Name:	Salem Generating Station Hope Creek Generating Station
Mailing Address:	P.O. Box 236 Hancocks Bridge, New Jersey 08038
Location:	PSEG Nuclear LLC Alloway Creek Neck Road Lower Alloways Creek Township

Tax Lot and Block:	Lots: 4, 4.01, 5, and 5.01; Block: 26	
Coordinate Centroid (NJ):	Salem Station	N 230, 436.38 / E 1, 754, 670.51
	Hope Creek Station	N 232, 184.40 / E 1, 754, 148.80
Geodetic Position:	Salem Station	N 39E 27' 46" / W 75E 32' 08"
	Hope Creek Station	N 39E 28' 03" / W 75E 32' 15"

SGS and HCGS occupy 740 acres of land on Artificial Island. SGS occupies 220 acres. HCGS occupies 153 acres. The remaining 367 acres are uncommitted. The occupied area includes containment buildings (which house the nuclear reactor), turbine buildings, a cooling tower, a simple cycle combustion turbines (which uses low sulfur distillate fuel), office and equipment buildings and structures, electrical switchyards, parking areas, roads, and equipment laydown areas. Riprap and bulkheads protect the shore from erosion. Detailed engineering plans and other facility documents are available onsite. Authorized regulatory agency personnel may gain access to SGS and HCGS, the engineering plans and other facility documents by contacting the Chemistry - Radwaste and Environmental Supervisors at (856) 339-1169 and/or (856) 339-2628 during normal working hours.

The only raw material potentially containing PCBs that SGS and HCGS use in conjunction with generating electricity is dielectric fluid that is contained in numerous transformers, oil-containing breakers, and switches. The dielectric fluid provides cooling and electrical insulation. Oil-filled electrical equipment is inspected weekly and/or quarterly for evidence of leaks. In addition, oil-filled electrical equipment-containing PCBs is also inspected quarterly per 40 CFR 761. Written checklists are used for each inspection and are maintained at the stations. Neither SGS nor HCGS accept PCB containing wastes that are generated off-site.

Figure 3.1 USGS Map with Locations of HCGS and SGS

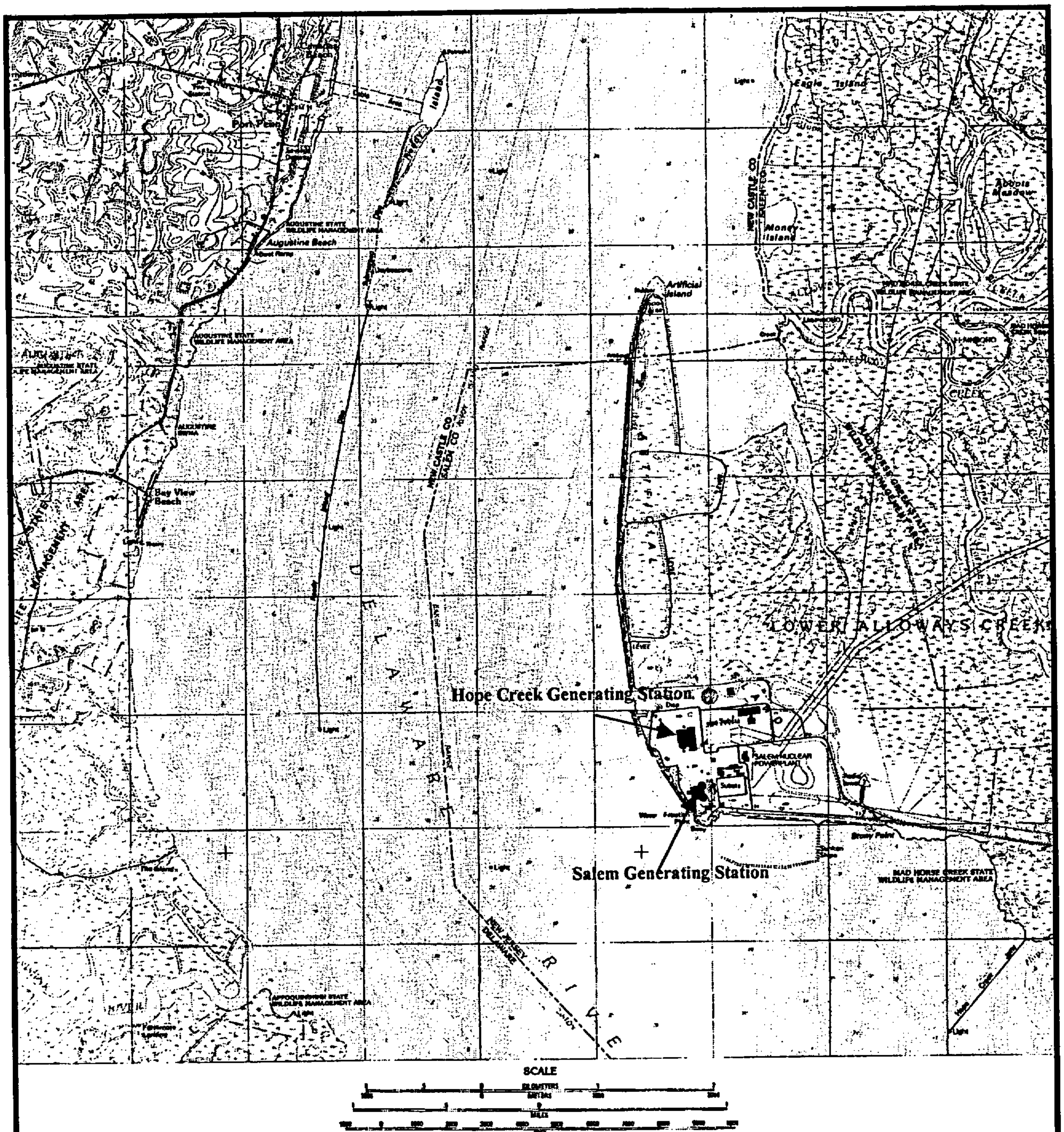


Figure 3.2 Water Balance Diagram for Salem Generating Station

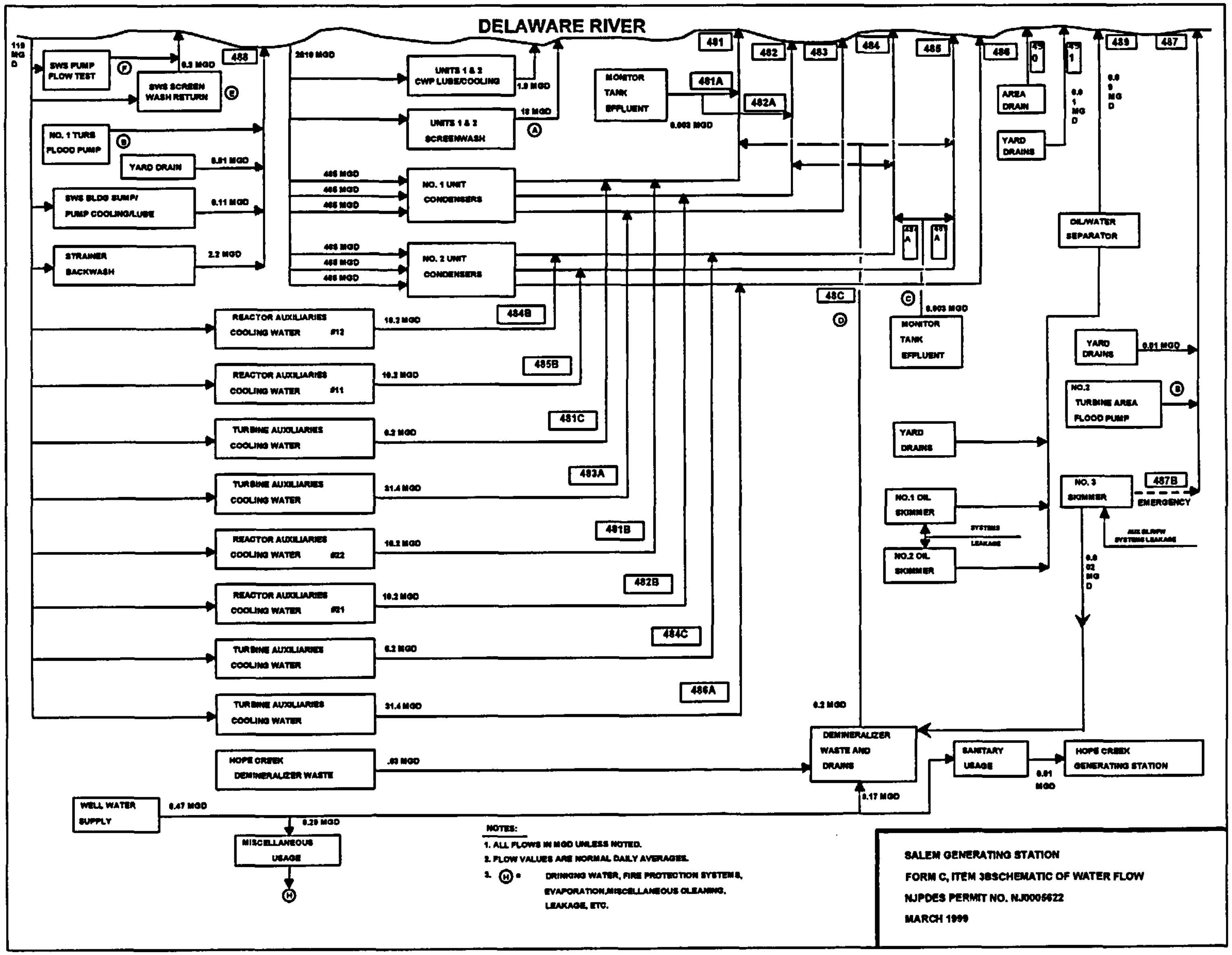
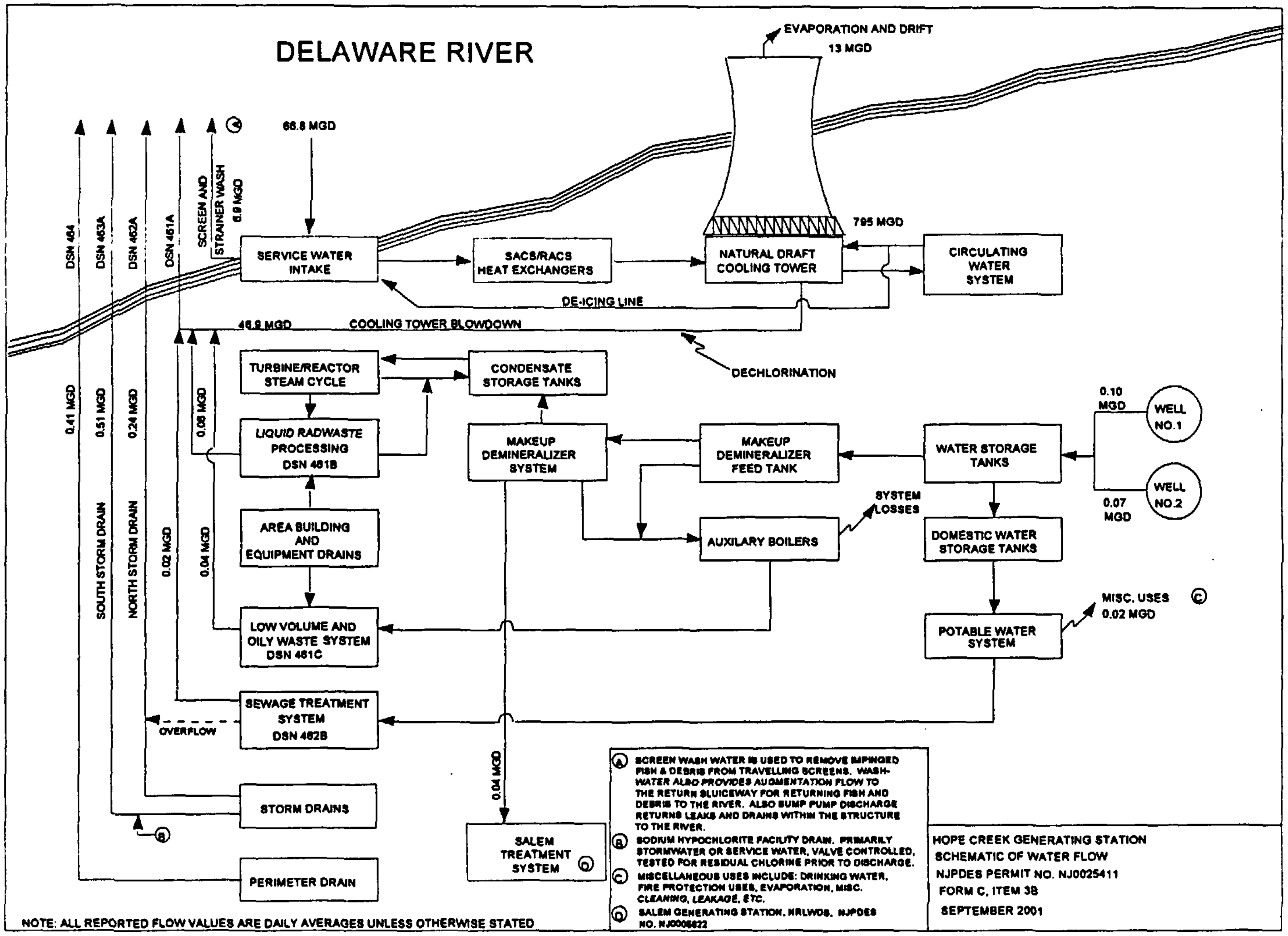


Figure 3.3 Water Balance Diagram for Hope Creek Generating Station.



4 Known Sources

Rule Section 40.3.9.E.4

SGS and HCGS have no known internal sources that contribute PCBs to the Delaware Estuary. However, there are two known external sources of PCBs that contribute PCBs to each station: atmospheric deposition and the Delaware Estuary itself.

Air deposition of PCBs has been demonstrated by the scientific community of New Jersey. Van Ry et al. (2002) provide estimates of "wet" and "dry" weather fluxes of PCBs at seven urban and background sampling sites across New Jersey. These estimates indicate that concentrations of PCBs exist in New Jersey rainfall and stormwater runoff and exceed applicable water quality criteria by several orders of magnitude. Therefore, discharges from SGS and HCGS that have stormwater component may contain PCBs. This would include discharges from the stations' oil-water separators, and yard drains and building drains that are intended to manage stormwater runoff. Although SGS and HCGS apply stormwater Best Management Practices (BMPs) to reduce the discharge of solids and surface runoff to the Delaware Estuary, they are not designed to reduce discharges of PCBs to concentrations that meet water quality criteria. The actual annual deposition of PCBs by air at either SGS or HCGS is unknown.

A second source of PCBs in discharges from SGS and HCGS is the Estuary. Water is withdrawn from Estuary primarily for cooling (either, once-through cooling at SGS or closed cycle cooling at HCGS) and secondarily for service water, and then is returned to the Estuary. Ambient concentrations of PCBs in Zone 5 of the Estuary exceed the water quality criteria by several orders-of-magnitude (EPA, 2003). Therefore, the PCBs may also be present in several discharges which contain riverwater. PSEG Nuclear LLC carefully reviewed the equipment at SGS and HCGS that Estuary water to determine if any piece of equipment could potentially add PCBs (Furnari, 2005). PSEG Nuclear LLC concluded that this equipment is not a source of PCBs because the hydraulic design of the cooling water and service water system prevents any oils that may inadvertently leak from the equipment, including any PCBs they might contain, from mixing with the cooling water and service water flows. Details of the evaluation and other discharges at SGS and HCGS are provided by Furnari (2005).

5 Potential Sources

Rule Sections 40.3.9.E.5 and 40.3.9.E.6

SGS and HCGS use various pieces of electric equipment that contain small amounts (typically less than 0.05 lbs) of PCBs. The two pieces of equipment with the largest amount of PCBs are the Station Power Transformer SH013.8 (approximately 0.25 lbs) and Substation 1 Temporary Yard Transformer (H057) (approximately 0.13 lbs). Table 1 is an inventory of the equipment known to contain PCBs, all equipment known to contain PCBs has been tested and those that have be verified as non-detectable have been documented in the master inventory. As indicated in table 1, the concentrations of PCBs in the equipment are all below 50 ppm. Thus, pursuant to Environmental Protection Agency regulations concerning PCBs at 40 CFR Pt. 761, the equipment is not "PCB-contaminated" nor "PCB-Contaminated Electrical Equipment." Further, although theoretically a potential source of PCBs, PSEG Nuclear routinely inspects this equipment as part of its DPRP.

There are four potential pathways at HCGS and SGS for PCBs from the equipment in Table 1 to the Estuary: (1) the stormwater drainage collection systems and the conveyances to the low volume oily waste system at HCGS: and (2) the stormwater drainage collection systems and the pipes from the oil-water separators at SGS, which includes the drainage collection system in the SGS turbine buildings; (3) the SGS waste treatment system which receives demineralizer and other chemical wastes as well as specific turbine building sumps; and, (4) the sewage treatment plant located at HCGS. Discharges that flow along these pathways have designated sampling locations (namely, DSN 489 which is just downstream of the oil-water separator at SGS; DSN 461C which is just downstream of the oil-water separator at HCGS; DSN 462B which is just downstream of the sewage treatment plant at HCGS; and DSN 48C which is just downstream of the demineralizer waste and drain sump at SGS) to determine the concentrations of certain pollutants.

Another potential source of PCBs that is not related to the generation of electricity at SGS and HCGS is the sanitary wastewater (or sewage treatment) system at HCGS. This system is designed to receive sanitary wastewater from shower rooms and rest rooms only and, therefore, is not expected to contain PCBs in significant concentrations. However, DRBC has evidence that PCBs are often present in this type of discharge. Recent measurements of the PCBs in the effluent of HCGS Sewage Treatment System indicate one or more "unknown" sources of PCBs to the sanitary wastewater flow. Figure 2 shows the locations of the discharge points (including their Discharge Serial Number, or DSN) and the influents to the wastewater flow for SGS. Figure 3 is the corresponding illustration for HCGS.

Table 1
Inventory of PCB Containing Equipment

Equipment	Unit	PCB Conc. (PPM)	Volume (gal)	Total Lbs PCBs
Substation 6 Temp. Yard Transformer (H055)	Hope Creek	34	345	0.09
Substation 1 Temp. Yard Transformer (H057)	Hope Creek	49	345	0.13
Substation 4 Temp. Yard Transformer (H060)	Hope Creek	36	345	0.10
13kv 4000amp Circuit breaker (H069)	Hope Creek	2	1208	0.02
13kv 4000amp Circuit breaker (H070)	Hope Creek	2	1208	0.02
13kv 4000amp Circuit breaker (H071)	Hope Creek	2	1208	0.02
13kv 4000amp Circuit breaker (H072)	Hope Creek	5	1208	0.05
Substation 8 Transformer (H100)	Common	4	250	0.01
Substation 9 Temp. Yard Transformer (H056)	Hope Creek	4	250	0.01
No. 11 Station Power Transformer (S092)	Salem 1	5	1000	0.04
No. 21 Station Power Transformer (S094)	Salem 2	4	1000	0.03
Substation No. 1 (S098)	Salem 1	3	60	0.00
Substation No. 1 (S099)	Salem 1	6	70	0.00
Substation No. 1 (S100)	Salem 1	3	60	0.00
Substation No. 1 (S101)	Salem 1	4	70	0.00
Substation No. 1 (S102)	Salem 1	5	70	0.00
Substation No. 2 (S104)	Salem 1	14	70	0.01
Substation No. 2 (S105)	Salem 1	9	70	0.00
Substation No. 2 (S106)	Salem 1	11	70	0.01
Substation No. 2 (S107)	Salem 1	3	80	0.00
Substation No. 2 (S109)	Salem 1	10	70	0.01
Substation No. 2 (S110)	Salem 1	9	70	0.00
Substation No. 5 (S115)	Salem 2	8	70	0.00
Substation No. 5 (S116)	Salem 2	3	70	0.00
Substation No. 5 (S117)	Salem 2	12	70	0.01
Substation No. 5 (S118)	Salem 2	21	70	0.01
Substation No. 5 (S119)	Salem 2	38	70	0.02
Substation No. 5 (S120)	Salem 2	3	70	0.00
Substation No. 5 (S122)	Salem 2	4	70	0.00
Substation No. 5 (S123)	Salem 2	3	70	0.00
Substation No. 3 (S125)	Common	7	70	0.00
Substation No. 3 (S126)	Common	6	70	0.00
Substation No. 3 (S127)	Common	6	70	0.00

Table 1 (continued)
Inventory of PCB Containing Equipment

Equipment	Unit	PCB Conc. (PPM)	Volume (gal)	Total Lbs PCBs
Substation No. 3 (S128)	Common	12	70	0.01
Substation No. 4 (S139.1)	Salem Common	9	70	0.00
Substation No. 4 (S139.2)	Salem Common	9	70	0.00
Substation No. 4 (S139.3)	Salem Common	10	70	0.01
Substation No. 4 (S140.1)	Salem Common	14	70	0.01
Substation No. 4 (S140.2)	Salem Common	9	70	0.00
Substation No. 4 (S140.3)	Salem Common	9	70	0.00
Substation No. 4 (S141.1)	Salem Common	2	70	0.00
No. 24 Station Power Transformer (S142)	Salem 2	3	3500	0.08
Spare Station Power Transformer (S148)	Common	3	3500	0.08
Substation 2 Temporary (H058)	Hope Creek	15	345	0.04
Substation 3 Temporary (H059)	Hope Creek	7	345	0.02
Substation 5 (H061)	Hope Creek	15	345	0.04
Station Power Transformer (SH013.8)	Common	9	3500	0.25
14kv No. 1 Aux Pwr Xfmr (S063)	Salem 1	3		0.01
Sum of PCBs (LBs)				1.27

6 Previous Minimization Activities

Rule Section 40.3.9.E.7

Since promulgation of the initial Toxic Substance Control Act ("TSCA") rules by USEPA in 1978, PSEG has developed and implemented policies and procedures to identify, manage and control PCBs at its facilities. In addition, through policies and procedures designed to comply with water discharge permits and spill prevention regulations, PSEG has acted to minimize the release of pollutants, including PCBs, to the environment.

Specific to TSCA, PSEG Nuclear LLC has a "beyond-compliance" program to remove PCB-containing equipment from its inventory of electrical equipment. PSEG Nuclear LLC's policy is to retire or retro fill electrical equipment taken out-of-service with PCB concentrations ≥ 50 ppm. Highlights of PSEG Nuclear LLC's program include:

- In 1992, voluntary retro fill of 3 PCB (≥ 500 ppm) and 16 PCB-contaminated (≥50 and ≤ 499 ppm) transformers. All equipment known to contain PCBs are listed in Table 1 of the preceding section.

- As of 2000, all light ballasts known to contain PCBs have been removed. If a light ballast is suspected of containing PCBs in the future it would be tested per station procedures.

Further, as mentioned in Section 2.1, PSEG Nuclear implements an extensive DPRP that incorporates a variety of measures required pursuant to a variety of programs, included the installation of secondary containments, clean-up and removal of soils impacted by accidental releases and the development and implementation of Best Management Practices to manage stormwater. The DPRP program includes regular inspections which are conducted and recorded pursuant to Federal and State statutes and regulations. Although that plan addresses a wide range of potential discharges and pollutants, the activities performed will necessarily provide significant preventative maintenance. For example, the electrical equipment identified in Table 1 is inspected under this program. If a leak or spill is detected, PSEG Nuclear personnel can respond, help prevent discharges into the environment and repair or replace the defective equipment. Section 7.2 discusses how PSEG will continue these practices as part of this PCB PMP.

7 Pollutant Minimization Measures

Rule Section 40.3.9.E.9

In addition to the extensive DPRP already in place, PSEG Nuclear is proposing to implement the following measures.

The oil-water separator at HCGS removes solids and floatable materials including any floating oil. The solids and recovered oil are transferred to an oily sludge holding tank before being removed to an U. S. Nuclear Regulatory Commission (USNRC) licensed disposal facility, if the residuals contain low levels of radioactivity. If the residuals are not radioactive, they are evaluated to determine if they are hazardous, requiring disposal in accordance with NJDEP regulations; and/or, a solid waste, requiring handling in accordance with those regulations. The system also has the ability to recycle oily sludge to promote settling of solids. Similarly, the oil-water separator at SGS removes solids and floatable materials including any floating oil. Similar disposal procedures are applied to the residuals from the SGS oil-water separator.

7.1 Actions to Minimize Known and Probable Sources

Neither SGS nor HCGS have known "internal" sources of PCBs. In the event an "internal" source is identified, appropriate minimization strategies will be developed, and the minimization strategy that provides the most reasonable practicable reduction will be implemented.

7.2 Actions to Identify and Control Potential Sources

As discussed in Section 6, PSEG Nuclear LLC has had in place policies and procedures designed to identify and control potential sources of PCBs. PSEG Nuclear LLC will continue the use of policies and procedures that are discussed in greater detail below.

Large transformers are typically equipped with internal devices that monitor oil levels and temperature. The monitors detecting a five (5) percent or greater loss of dielectric fluid would alert PSEG Nuclear LLC personnel of a problem. Smaller transformers, oil circuit breakers (OCBs), switches, and miscellaneous electrical equipment that may not have such monitors, upon failure, would typically upset the electrical system resulting in the failure being detected. To further guard against discharges, responsible departments perform weekly transformer area inspections for transformers with no secondary containment or diversion systems. A log, used for each inspection, is maintained at the facility in accordance with the facility Records Management Program. In addition, more detailed transformer inspections are conducted quarterly.

PSEG Nuclear LLC applies sound engineering practices and includes engineering controls during installation of new oil-filled electrical equipment. As a part of this, secondary containment or diversion has been provided for large oil-filled transformers. To further guard against unidentified discharges, selected transformer drains to the Salem oil/water separator may be isolated to allow visual identification of oil leakage. When existing electrical equipment is upgraded and/or replaced, PSEG Nuclear LLC will install secondary containment structures and/or diversion systems on a scheduled basis where practicable.

PSEG Nuclear LLC will use the results of the 2005 PCB Sampling Program and subsequent biennial sampling to determine if unknown sources of PCBs at SGS or HCGS are contributing PCBs to the discharges from SGS and HCGS. An indication that an unknown source exists would be a significant difference in the concentration and distribution of homologs that are present in the discharge sample and rainwater. If the existence of an unknown source is confirmed, PSEG Nuclear LLC will first develop a strategy to identify the source. Once the source is identified, the extent to which the source can be controlled or eliminated will be determined. Control could include the possible modification of any treatment processes along the flow path to the Estuary that could help achieve the Maximum Practical Reduction in the PCB loading.

8 Source Prioritization

Rule Section 40.3.9.E.10

PSEG Nuclear LLC prioritizes electrical equipment for retro-fill/replacement, on an annual basis as part of the PCB Assessment. Equipment is prioritized by concentration with consideration given to equipment based on PCB concentration. Any equipment requiring retro-filling or replacement is then handled through PSEG Nuclear LLC's Business Plan.

9 Key Dates

Rule Section 40.3.9.E.11

Activity	Start Date	End Date
Complete sampling of PCB sampling program approved by DRBC (PSEGSC, March 2005; Fikslin, April 2005)	6/1/2005	12/31/2005
Develop schedule for reducing mass of PCBs in electrical equipment	11/1/2005	2/28/2006
Complete analyses of PCB sampling program approved by DRBC	6/1/2005	2/28/2006
Evaluate results of sampling program to determine if "unknown" sources of PCBs are entering the effluent streams	3/1/2006	6/30/2006
If unknown sources are believed present, design track down study	7/31/2006	8/15/2006
Draft and submit annual report	8/15/2006	10/3/2006
Design sampling program for first round of biennial sampling	10/1/2006	10/31/2006
First round of biennial sampling for PCB	2/1/ 2007	3/1/2007
Evaluate results of biennial sampling for PCBs	4/15/2007	6/30/2007
Draft and submit annual report	8/15/2007	10/3/2007
Design sampling program for second round of biennial sampling	10/1/2008	10/31/2008
Second round of biennial sampling for PCBs	2/1/2009	3/1/2009
Evaluate results of second biennial sampling for PCBs	5/1/2009	6/30/2009
Revise PMP (including schedule) for future years	7/1/2009	7/15/2009
Monitoring for leaks from equipment known to contain, or potentially containing PCBs. Remove/repair leaking equipment. Change oil in leaking equipment to eliminate PCBs	On-going	
Track reductions in mass of PCBs due to change outs of equipment considered as a potential source of PCBs	On-going	

10 Measuring, Demonstrating, and Reporting Progress

Rule Sections 40.3.9.E.12 and 40.3.9.E.13

PSEG Nuclear LLC will determine the reduction in the mass of PCBs in the inventory of equipment listed in Table 1. The reduction will be measured from December 15, 2003, the day the Stage 1 TMDL was approved by the U. S. Environmental Protection Agency.

PSEG Nuclear LLC will maintain a record of all unknown sources that are identified, and the reduction in PCBs due to the elimination or control of the source of the modification of an in-stream plant process that reduces the loading from the source to the Estuary.

PSEG Nuclear LLC will construct a plot of the PCB loadings versus time to determine the trend in the discharge of PCBs in the discharges from DSN 489, DSN 48C, DSN 461C, and DSN 462B. The PCB loadings will be calculated using the results from the 2005 PCB Sampling Program, and subsequent biennial samples.

10.1 Sampling and Analytical Approaches

PSEG Nuclear LLC will perform biennial sampling of the discharges from DSN 489A and DSN 48C at SGS, and from DSN 461C and DSN 462B at HCGS. The discharge flows will be sampled and analyzed following the Sampling and Analytical Requirements posted at http://www.state.nj.us/drbc/PCB_info.htm (as of June 1, 2005). The analytical requirements include the use of Method 1668A and the quality control specifications that are at http://www.state.nj.us/drbc/PCB-Modifications020305.pdf.

Other analytical methods will be evaluated and applied for screening or trackdown purposes as necessary.

10.2 Estimated Baseline Load

This section provides a combined estimate for SGS and HCGS of the annual baseline loading (in grams/year) of PCBs to the surface water of the Delaware Estuary. As explained in Section 4, the baseline loading is believed to be due to "wet" and "dry" weather fluxes from "external" sources, probable sources contributing to the each station's oil-water separator (namely, Outfall 461C at HCGS and Outfall 489 at SGS), and "unknown" sources that are influents to the two Stations' single sewage treatment system (Outfall 462B at HCGS). The total baseline loading is sum of the individual baseline loadings for each outfall. The individual baseline load is estimated as the product of the outfall's average annual discharge volume and the baseline concentration of total PCBs in the discharge.

Baseline Flow

The duration and magnitude of the discharge from DSN 461C are variable. For the period from January 2000 through July 2005, the daily average flow is 0.0426 MGD. Therefore, the annual volume of water discharged from DSN 461C is:

$$\textbf{Annual Discharge Volume} = \textbf{0.0426 MGD} \times \frac{\textbf{365}}{\textbf{yr}} = \frac{\textbf{15.5} \times \textbf{10}^6\ \textbf{gal}}{\textbf{yr}}$$

The Sewage Treatment System, DSN 462B, is an internal waste stream. For the period from February 2000 through July 2005, the average daily flow is 0.0131 MGD. Therefore, the annual volume of water discharged from DSN 462B is:

$$\textbf{Annual Discharge Volume} = \textbf{0.0131 MGD} \times \frac{\textbf{365}}{\textbf{yr}} = \frac{\textbf{4.8} \times \textbf{10}^6\ \textbf{gal}}{\textbf{yr}}$$

The duration and magnitude of the discharge from DSN 48C is variable. For the period January 1999 through June 2005, the average daily discharge is 0.1151 MGD. The corresponding annual volume of water discharged is:

$$\textbf{Annual Discharge Volume} = \textbf{0.1151 MGD} \times \frac{\textbf{365}}{\textbf{yr}} = \frac{\textbf{42.0} \times \textbf{10}^6\ \textbf{gal}}{\textbf{yr}}$$

The duration and magnitude of the discharge from DSN 489A is variable. For calendar years 1999 through 2004, the average daily discharge is 0.1073 MGD. The corresponding annual volume of water discharged is:

$$\textbf{Annual Discharge Volume} = \textbf{0.1073 MGD} \times \frac{\textbf{365}}{\textbf{yr}} = \frac{\textbf{39.2} \times \textbf{10}^6\ \textbf{gal}}{\textbf{yr}}$$

Baseline Concentration of PCBs

A grab sample of the discharge from Outfall 461C was collected on June 1, 2005. Approximately 120 congeners were detected. The sum of the individual concentrations of all congeners with concentrations equal to or greater than the Estimated Detection Limit ("EDL") was 1,968 picograms per liter (pg/l which is equivalent to 10^{-6} grams per liter). The sum of the EDLs of the undetected congeners is 93 pg/l. The total concentration of the detected congeners falls between the extremes of concentrations of PCBs in rainwater that Van Ry et al. (2002) reported for 7 coastal-suburban sites in densely- and lightly- populated areas and urban-industrial sites in New Jersey.

The distributions of PCB homologs in the single sample from each outfall are shown in Figure 10.1. Penta-PCBs and hexa-PCBs accounted for approximately 60 percent of the total PCBs.

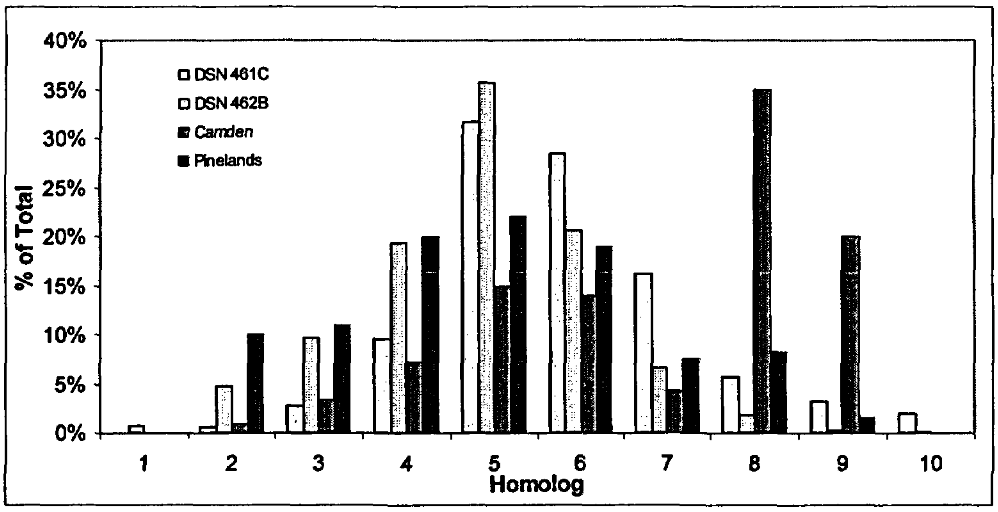


Figure 10.1 Relative distributions of homologs in the discharge from Outfalls DSN 461C and DSN 462B at Hope Creek Generating Station, and in rainfall at Camden and the New Jersey Pinelands

A grab sample of the wastewater that is discharged from Outfall 462B was collected on June 1, 2005. Approximately 160 congeners were detected. The sum of the concentrations of all congeners with concentrations equal to or greater than the Estimated Detection Limit ("EDL") is 7,284 pg/l (7.3 nanograms per liter or ng/l). The sum of the EDLs of the undetected congeners is 45 pg/l. The total concentration of the detected congeners falls between the extremes of concentrations of PCBs (0.35 ± 0.11 ng/l to 13.0 ± 2.8 ng/l) in rainwater that Van Ry et al. (2002) reported for 7 coastal-suburban sites in densely- and lightly- populated areas and urban-industrial sites in New Jersey.

The distributions of PCB homologs in the single sample and in rainfall samples collected at Camden, NJ and in the New Jersey Pinelands are shown in Figure 10.1. Penta-PCBs and hexa-PCBs accounted for more than 50 percent of all the PCBs in the sample from DSN 461C and DSN 462B. The percentages of the total PCBs appear to be higher than those based reported by Van Ry (2002) for the 7 New Jersey costal-suburban and industrial-urban sites. No mono-PCBs were detected.

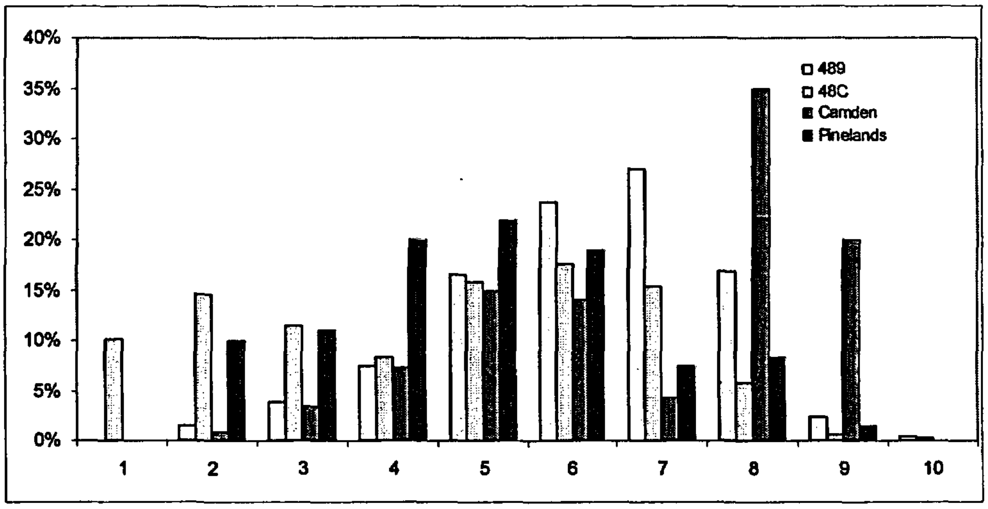


Figure 10.2 Relative distributions of homologs in the discharge from Outfall DSN 489 and DSN 48C at Salem Creek Generating Station, and in rainfall at Camden and the New Jersey Pinelands

A grab sample of the oil-water separator that is discharged from Outfall 489 was collected on June 1, 2005. Approximately 150 congeners were detected. The sum of the individual concentrations of all congeners with concentrations equal to or greater than the EDL is 3,634 pg/l. The sum of the EDLs of the undetected congeners is 48 pg/l. The total concentration of the detected congeners falls between the extremes of concentrations of PCBs in rainwater that Van Ry et al. (2002) reported for 7 coastal-suburban sites in densely- and lightly- populated areas and urban-industrial sites in New Jersey.

A 24-hour composite sample of the discharge from DSN 48C was collected on June 21, 2005. Approximately 90 congeners (excluding co-eluters) were detected. The sum of the individual concentrations of all congeners with concentrations equal to or greater than the EDL is 2,292 pg/l The sum of the EDLs of the undetected congeners is 128 pg/l. The total concentration of the detected congeners falls between the extremes of concentrations of PCBs in rainwater that Van Ry et al. (2002) reported for 7 coastal-suburban sites in densely- and lightly- populated areas and urban-industrial sites in New Jersey.

The distributions of PCB homologs in the single sample and in rainfall samples collected at Camden, NJ and in the New Jersey Pinelands are shown in Figure 10.2. With the exception of septa-PCBs, the distribution of PCBs in the discharge from DSN 489 appears to have characteristics of both the coastal-suburban and urban-industrial sites selected by Van Ry et al. (2002). This could be due to SGS and HCGS proximity to Camden and the New Jersey Pinelands. For the June 1, 2005 samples at DSN 489, hexa-PCBs and septa-PCBs account for approximately 50 percent of the total PCBs. Penta-PCBs and octa-PCBs account for approximately 33 percent of the total PCBs. No mono-PCBs were detected in this sample.

Baseline Loading

As of August 31, 2005, one sample was collected and analyzed from DSN 461C, DSN 462B, DSN 489, and DSN 48C. At this time, the estimated baseline concentration for each outfall is assumed to equal the total of the concentrations of individual congeners that are detected above the EDL plus an uncertainty factor. The uncertainty factor equals the sum of the EDL's of undetected congeners. The estimated baseline loading for an outfall is calculated by multiplying the estimated baseline concentration plus the uncertainty factor by the annual volume of discharge. The baseline loading from SGS and HGGS is the sum of the baseline loads for DSN 461C, DSN 462B, DSN 489, and DSN 48C. The following are the calculations for each outfall:

- DSN 461C – Oil-Water Separator (HCGS)

$$\textbf{Baseline Loading} = \frac{1968 + 93\ \text{pg}}{\text{L}} \times \frac{15.5 \times 10^{6}\ \text{gallons}}{\text{yr}} \times \frac{3.785\ \text{L}}{\text{gallons}} \times \frac{10^{-12}\ \text{g}}{\text{pg}} = \frac{0.121\ \text{g}}{\text{yr}}$$

- DSN 462B – Sewage Treatment Unit (HCGS)

$$\textbf{Baseline Loading} = \frac{7284 + 45\ \text{pg}}{\text{L}} \times \frac{4.8 \times 10^{6}\ \text{gallons}}{\text{yr}} \times \frac{3.785\ \text{L}}{\text{gallons}} \times \frac{10^{-12}\ \text{g}}{\text{pg}} = \frac{0.133\ \text{g}}{\text{yr}}$$

- DSN 48C – Sump for Demineralizer Waste and Unit No.2 Turbine Building Drains

$$\textbf{Baseline Loading} = \frac{2292 + 128\ \text{pg}}{\text{L}} \times \frac{42.0 \times 10^{6}\ \text{gallons}}{\text{yr}} \times \frac{3.785\ \text{L}}{\text{gallons}} \times \frac{10^{-12}\ \text{g}}{\text{pg}} = \frac{0.362\ \text{g}}{\text{yr}}$$

- DSN 489A – Oil Water Separator (SGS)

$$\textbf{Baseline Loading} = \frac{3634 + 48\ \text{pg}}{\text{L}} \times \frac{39.2 \times 10^{6}\ \text{gallons}}{\text{yr}} \times \frac{3.785\ \text{L}}{\text{gallons}} \times \frac{10^{-12}\ \text{g}}{\text{pg}} = \frac{0.546\ \text{g}}{\text{yr}}$$

The sum of the individual baseline loadings from the four outfalls is 1.162 grams per year (g/yr).

10.3 Anticipated Reductions to Baseline Load

PSEG Nuclear LLC does not anticipate an immediate reduction in the baseline load for several reasons. First, neither SGS nor HGCS have known sources of PCBs. Second, sufficient data are not available to determine if PCBs in the samples collected at DSN 489A and DSN 461C are from atmospheric deposition, an internal unknown source, or both. If the only source of PCBs is atmospheric deposition, then no reductions are anticipated until the regulatory authorities with jurisdiction over emissions to the atmosphere take the appropriate action to reduce emissions of PCBs. If an unknown internal source contributes PCBs, the loading from that source and the extent to which it can be controlled must be determined before an anticipated reduction can be provided. Third, while the concentration of PCBs in the single sample sewage treatment plant suggest the presence of an internal "unknown" source, additional data are needed to determine whether this result is representative or is an anomaly. Finally, a reasonable estimate of reductions to the baseline load will require the collection of additional data, a more thorough understanding of the variability in the PCB concentrations in each of the discharges, and the discovery (if any) of "unknown" sources of PCBs at SGS and HCGS.

10.4 Continuing Assessment

Rule Section 40.3.9.F

PSEG Nuclear LLC will rely on current monitoring plans approved by DRBC as the basis for completing this section. Key dates and activities associated with the continuing assessment are included in Section 9. This information will be augmented by the development of assessment matrices compatible with measuring progress through means other than achieving load reductions, for example, the tracking of PCB equipment removed from service and properly disposed.

11 References

PSEG Nuclear LLC, Discharge Prevention and Response Program, Volume 1, January 27, 2005.

PSEG Nuclear LLC, Discharge Prevention and Response Program, Volume 2, January 27, 2005.

New Jersey Department of Environmental Protection, Salem Generating Station, NJPDES Permit No. NJ0005622 (June 29, 2001)

New Jersey Department of Environmental Protection, Hope Creek Generating Station, NJPDES Permit No. NJ0025411 March 1, 2003)

PSEG Services Corporation, Letter to Carol Collier, Executive Director, Delaware River Basin Commission, March 11, 2005

Fikslin, T. J. Letter to Russell J. Furnari, April 6, 2005

United States Environmental Protection Agency, Regions II and III, Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2- 5 of the Delaware River, prepared by the Delaware River Basin Commission, West Trenton, New Jersey, December 15, 2003