HOPE CREEK GENERATING STATION
ENVIRONMENTAL REPORT-OPERATING LICENSES STAGE
AMENDMENT 4 PAGE CHANGES

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The attached pages, tables, and figures are part of your controlled copy of the Hope Creek Generating Station ER-OLS. This material should be incorporated into your ER-OLS by following instructions below.

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Abundance declines during late September, October and November, as the decreasing water temperature initiates emigration to overwintering areas downbay and/or offshore. Perhaps more in response to lowering salinity than to temperature, white perch move into the area from upriver in the fall. Conversely, progeny of Atlantic croaker migrate into the area during the fall, and utilize it as a nursery until minimum water temperatures (January or February) prompt their return downbay, to warmer water. During winter, variety within the local ichthyofaunal community is low; only white perch, hogchoker and silvery minnow are common. Low water temperature limits activity as metabolism slows, and restricts the distribution of these fish to the deeper waters.

2.2.3 ENDANGERED AND THREATENED SPECIES

The shortnosed sturgeon, Acipenser brevirostrum, has been found in the Delaware River; it is listed as endangered by both the Fish and Wildlife Service (50 CFR 17) and the state of New Jersey (NJR 7:25-11.1). From 1950 through June 1982 a total of 49 incidental captures have occurred in the Delaware River drainage area. Five specimens were captured in the vicinity of Artificial Island. Of these, two were found in either a gill net or 4.5-meter trawl, and the remaining three were found at a cooling water intake; two having died prior to arrival and one was damaged. Brundage (Reference 2.2-17) 4
provides a discussion of all captures. Masnik (Reference 2.2-18) discusses the impact of the operation of HCGS.

Sea turtles have also been observed within the Delaware Bay, including the Atlantic loggerhead, Caretta caretta; Kemp's Atlantic Ridley, Lepidochelys kempii; and green sea, Chelonia mydas. The loggerhead and green sea turtles are threatened and the Ridley is endangered (50 CFR 17). The state of Delaware maintains a list of incidental sea turtle captures. Between 1978 and 1980 a total of eight loggerheads and three Ridley's were listed. In addition, during the current study, fourteen turtles were captured in bottom trawls or on an intake structure's trash bars. Ten of these turtles were loggerheads; seven of the ten were dead, and three were alive, and were released. Three Ridley's were found: one live and 4
two dead. One live green sea turtle and one unidentified live turtle were also found. All live turtles were released. During the current study, most dead turtles were confirmed as having been dead prior to reaching the intake structure; these were disposed of in accordance with National Marine Fisheries Service (NMFS) directions.

Terrestrial endangered and threatened species within the vicinity of the site included the peregrine falcon (federally listed as endangered) and the bald eagle and osprey (listed by the State as endangered).

than aquicludes) of Cretaceous, Tertiary and Quaternary ages underlie the Coastal Plain. River bed sand and gravel compose the first aquifer encountered, which is called the "shallow" aquifer. Grayish-brown clay belonging to the Kirkwood Formation underlies the river bed sand and gravel.

The Kirkwood clay is underlain by a second aquifer, composed of the basal sand of the Kirkwood Formation, all of the Vincentown Formation, and the upper sands of the Hornerstown Formation.

A direct hydraulic connection exists from one sand layer to the next; therefore, for analytical purposes, the combination of these three sand units is referred to as the Vincentown (or "deep") Aquifer.

The Mount Laurel and Wenonah sands, referred to herein as the Mount Laurel-Wenonah aquifer, are separated from the overlying Vincentown Formation by a 12 meter (40 foot) thick aquitard, consisting of the Hornerstown and Navesink Formations.

Underlying the Mount Laurel-Wenonah aquifer are the Marshalltown Formation; the Englishtown sand, the Woodbury clay; the Merchantville clay; and the Raritan and Magothy Formations. From this group, only the Raritan and Magothy Formations constitute a significant aquifer at the site. The remaining formations are aquitards and aquicludes. See Section 2.4, for details.

In the strictest sense of the word, all of the soil formations underlying the HCGS site are hydraulically connected with each other, as none of the confining layers which separate the aquifers is completely impermeable. Whereas permeabilities are about 21 cubic meters per day per square meter (524 gallons per day per square foot) for the shallow aquifer, five cubic meters per day per square meter (124 gallons per day per square foot) for the Vincentown aquifer, and 4 cubic meters per day per square meter (100 gallons per day per square foot) for the Mount Laurel-Wenonah aquifer, the permeabilities of the confining beds are significantly less. The estimated vertical permeability for the Hornerstown and Navesink Formations is 0.02 cubic meter per day per square meter (0.4 gallon per day per square foot), and the Kirkwood clay is estimated at less than 0.2 cubic meter per day per square meter (5 gallons per day per square foot). Thus, the confining beds act as aquitards, and allow some leakage to occur between aquifers whenever there is a vertical hydraulic gradient between adjacent aquifers separated by an aquitard.

Section 2.4 gives a brief description of the major aquifers encountered at the site.

2.6 REGIONAL HISTORIC, ARCHAEOLOGICAL, ARCHITECTURAL, SCENIC, CULTURAL AND NATURAL FEATURES

HCGS is located in an area which is rich in history. Both Salem County, New Jersey and New Castle County, Delaware were among the first regions in the country to be settled. Although a considerable amount of cultural resource survey data are available for New Castle County (References 2.6-1 and 2.6-2), less is available for Salem County (Reference 2.6-3). A Stage I Cultural Resource Survey for Fort Mott, located approximately 16 kilometers (10 miles) north of HCGS in Lower Pennsville, New Jersey, was completed in 1979 (Reference 2.6-4). A recently released report concerns the restoration of Fort Mott (Reference 2.6-5). An archaeological excavation undertaken in the city of Salem uncovered no cultural resources (Reference 2.6-6). The plant site is located on Artificial Island, which was created early in the twentieth century from the deposition of dredge material by the U. S. Army Corps of Engineers; therefore, the site property holds no archeological significance.

Salem County's original inhabitants were the semi-nomadic, agriculturally oriented Lenni-Lenape indian tribe. Since there was no established settlement in the vicinity of the site, traces of their existence are limited to artifacts.

John Fenwick, a Quaker who purchased the land from Lord Berkeley, one of New Jersey's first proprietors, founded the city of Salem in 1675 (Reference 2.6-7). It was once a bustling port area, whose economy centered around the Delaware River and the fertile farmland. Caspar Wistak of Philadelphia introduced the first glassworks to the area in 1738; this industry has continued to be prominent to this day.

The Salem area was of significance during the Revolutionary War. General George Washington dispatched General "Mad Anthony" Wayne to Salem (Fenwick's Colony) to obtain food for the starving Continental Army at Valley Forge. The local residents were extremely generous in supplying the troops with the needed provisions. The British retaliated by sending troops into the Salem County area to quell local resistance. The Tory troops captured a contingent of local patriots and massacred all but two of them in the William Hancock House (Reference 2.6-8).

Of historical interest are the twenty-nine remaining eighteenth-century brick dwellings and meeting houses with patterned or decorated gable ends (Reference 2.6-9). Nearest to the site is the Chambless House, located on the east side of Alloways Creek Neck Road, approximately 6.2 kilometers (3.9 miles) from the station. Built in 1730, it is one of the oldest examples of this architectural style (Reference 2.6-10). The Chambless House is not presently lived in or maintained. The Hancock House in Hancocks's Bridge, which is listed on the National Register of Historic Places, is said to have been patterned after the Chambless House.

Pursuant to the National Historic Preservation Act of 1966, the National Park Service annually lists properties on the the National Register of Historic Places. Listed properties have met the criteria for inclusion on the Register. Additional properties, determined by the Advisory Council on Historic Preservation to be eligible for inclusion in the Register, are also listed annually by the National Park Service. Many of these properties are already listed on state registers.

Table 2.6-1 contains properties, listed on the National Register of Historic Places, that are located within a 16 kilometer (10 mile) radius of HCGS (References 2.6-11 and 2.6-12). For the locations of these properties, see Figure 2.6-1.

The following districts and sites in New Castle County, Delaware, are listed as eligible for inclusion on the National Register of Historic Places (Reference 2.6-12):

a. Delaware City Historic District
b. St. Georges Historic District
c. Townsend Historic District
d. Reedy Island Range Rear Lighthouse

There are no sites in New Jersey within a 16 kilometer (10 mile) radius of HCGS that are listed as eligible for the National Register of Historic Places (Reference 2.6-3). However, the Broadway Historic District in Salem City is pending nomination to the State and National Registers of Historic Places (Reference 2.6-13). 4

Table 2.6-2 identifies historic sites listed on the National Register of Historic Places within 2 kilometers (1.2 miles) 1 of either side of the Salem - Deans transmission line portion (see Figure 3.9-3). There are no sites classified as eligible for inclusion on the Register (Reference 2.6-3).

TABLE 2.6-1

HISTORIC PROPERTIES LISTED ON THE
NATIONAL REGISTER OF HISTORIC PLACES AS OF FEBRUARY 7, 1984 4
WITHIN 16 KILOMETERS (10 MILES) OF HCGS

LOCATION	DATE ADOPTED TO NATIONAL REGISTER OF HISTORIC PLACES
SALEM COUNTY, NEW JERSEY	
Elsinboro Township	
1. HOLMELAND (Benjamin Holme's House), Fort Elfsborg Hancocks Bridge Road	08/31/78
2. SAMUEL AND SARAH NICHOLSON HOUSE (1752), Amwellbury Road	02/24/75
Lower Alloways Creek	
3. HANCOCK HOUSE (1734) Hancocks Bridge, Locust Island Road	12/18/70
Pennsville Township	
4. FINN'S POINT REAR RANGE LIGHT (1876) Intersection of Fort Mott and Lighthouse Roads	08/30/78
5. FORT MOTT AND FINN'S POINT NATIONAL CEMETERY DISTRICT (1865) On the Delaware River at Finn's Point	08/31/78
Salem City	
6. MARKET STREET HISTORIC DISTRICT (18-19th Century) Area includes 9-119 Market Street, and East Broadway	04/10/75
CUMBERLAND COUNTY, NEW JERSEY	
Greenwich Township	

TABLE 2.6-1 (Continued)

LOCATION		DATE ADOPTED TO NATIONAL REGISTER OF HISTORIC PLACES
16.	PHILIP READING TANNERY 201 East Main St.	04/26/78
17.	ST. JOSEPH'S CHURCH, 15 West Cochran St.	02/17/78
	Middletown Vicinity	
18.	ARNOLD S. NAUDAIN HOUSE South of Middletown on DE 71	04/24/73
19.	NOXONTOWN South of Middletown off DE 896	07/02/73
20.	OLD ST. ANNE'S CHURCH South of Middletown off DE.71	03/07/73
21.	ACHMESTER North of Middletown on SR 429	12/28/79
	Odessa	
22.	APPOQUINIMINK FRIENDS MEETINGHOUSE Main St.	12/04/72
23.	CORBIT-SHARP HOUSE Southwest corner of Main and 2nd Sts.	12/24/67
24.	ODESSA HISTORIC DISTRICT Bounded roughly by Appoquinimink Creek on southeast, High St. on northeast, 4th St. on northwest and Main St. on southwest	06/21/71
25.	OLD DRAWYERS CHURCH U.S. 13	02/06/73
25a.	OLD ST. PAUL METHODIST EPISCOPAL CHURCH High St.	05/13/82 4
	Odessa Vicinity	
26.	DUNCAN BEARD SITE	12/18/73

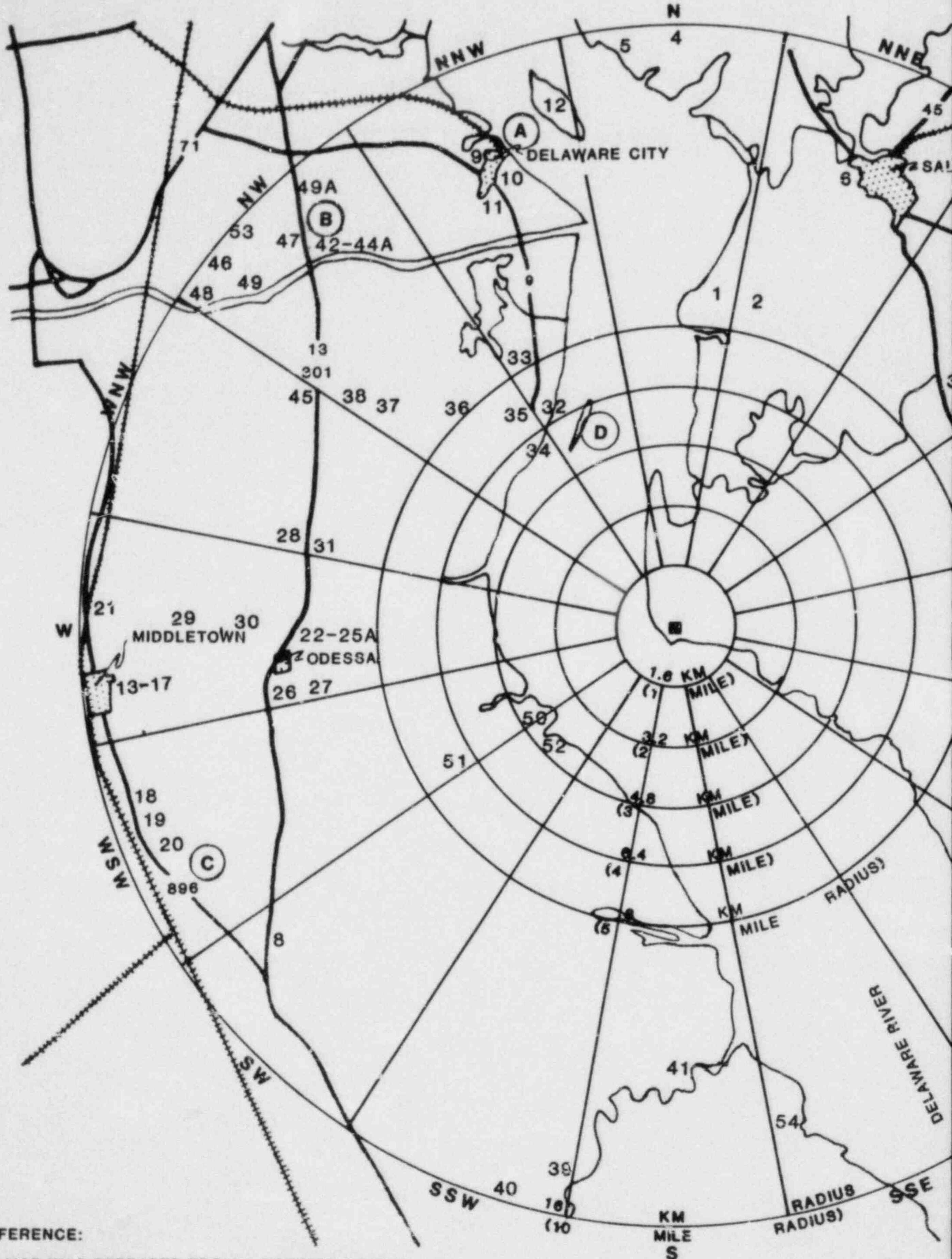
TABLE 2.6-1 (Continued)

LOCATION	DATE ADOPTED TO NATIONAL REGISTER OF HISTORIC PLACES	
Smyrna Vicinity		
39. BRICK STORE East of Smyrna on DE 488	08/14/73	
40. CLEARFIELD FARM North of Smyrna on DE 485	03/20/73	
41. FLEMING HOUSE Northeast of Smyrna on DE 9	01/31/80	
St. Georges		
42. BLOOMFIELD U.S. 13	04/08/82	
43. ROY HOUSE	04/08/82	
44. SUTTON HOUSE Broad and Delaware Sts.	04/24/73	
44a. VERNACULAR FRAME HOUSE Delaware St.	04/08/82	4
St. Georges Vicinity		
45. BIDDLE HOUSE South of St. George on U.S. 13	12/08/78	
46. W. CASEPERSON HOUSE Kirkwood Rd.	04/08/82	4
47. LINDEN HILL 0.8 kilometers (0.5 miles) north on U.S. 13	04/08/82	
48. MCCOY HOUSE 2.2 kilometers (1.4 miles) west on DE 407	04/08/82	

TABLE 2.6-1 (Continued)

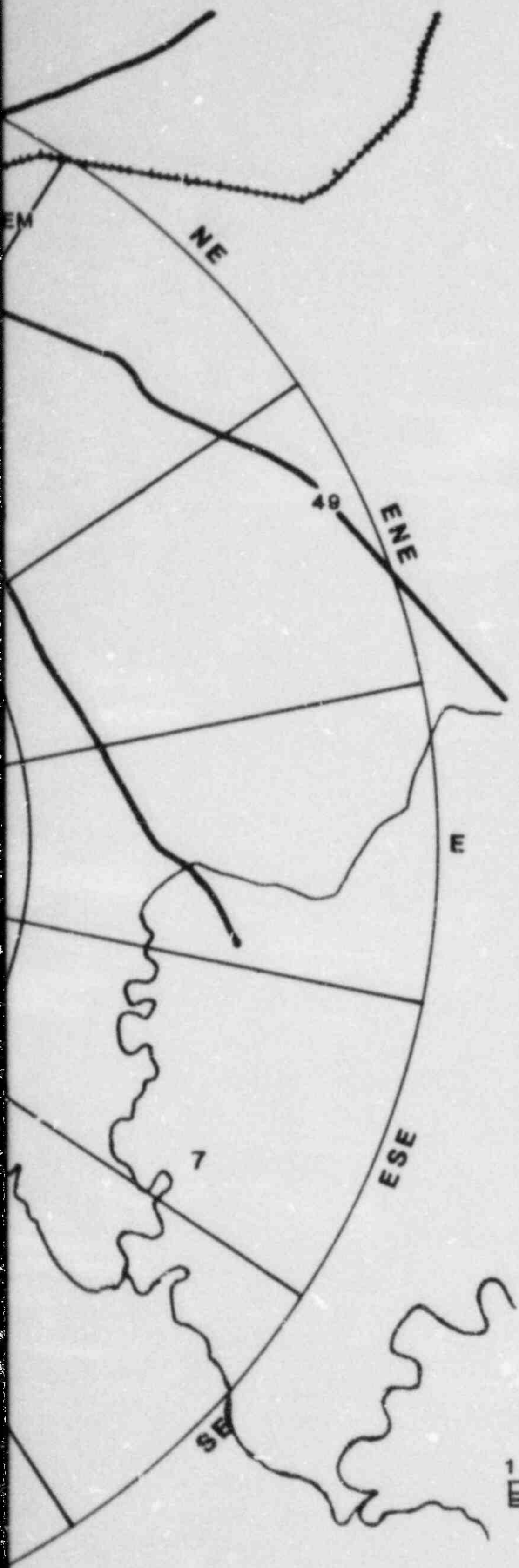
LOCATION	DATE ADOPTED TO NATIONAL REGISTER OF HISTORIC PLACES
49. ST. GEORGE'S CEMETERY AND CARETAKER'S HOUSE 1.3 kilometers (0.8 miles) west on DE 409	04/08/82
49a. STARL HOUSE U.S. 13	04/08/82
Taylors Bridge Vicinity	
50. HART HOUSE East of Taylors Bridge on DE 453	03/20/73
51. HUGUENOT HOUSE (HOMESTEAD FARM, NAUDAIN HOUSE) West of Taylors Bridge on DE 9	03/20/73
52. LISTON HOUSE East of Taylors Bridge on DE 453	03/26/73
Kirkwood Vicinity	
53. Dragon Run Farm 1.9 Kilometers (1.2 miles) West on DE 4027	04/08/82
KENT COUNTY, DELAWARE	
Woodland Beach Vicinity	
54. THOMAS SUTTON HOUSE (NEWBERRY) DE 79 Within Woodland Beach Wildlife Area	04/11/73

4



REFERENCE:

THIS MAP WAS PREPARED FROM A PORTION OF THE FOLLOWING U.S.G.S. MAP: WILMINGTON, DELAWARE, 1966



HISTORIC FEATURES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES

1. HOLMELAND
2. SAMUEL AND SARAH NICHOLSON HOUSE
3. HANCOCK HOUSE
4. FINN'S POINT REAR RANGE LIGHT
5. FORT MOTT AND FINN'S POINT NAT'L CEMETERY DISTRICT
6. MARKET ST. HISTORIC DISTRICT
7. THOMAS MASKEL HOUSE
8. OLD UNION METHODIST CHURCH
9. CHELSEA HOUSE
10. EASTERN LOCK OF THE CHESAPEAKE AND DELAWARE CANAL
11. FAIRVIEW
12. FORT DELAWARE ON PEA PATCH ISLAND
13. GREENLAWN (OUTTEN DAVIS HOUSE: WILLIAM BRADY HOUSE)
14. MIDDLETOWN ACADEMY
15. MIDDLETOWN HISTORIC DISTRICT
16. PHILIP READING TANNERY
17. ST. JOSEPHS CHURCH
18. ARNOLD S. NAUDAIN HOUSE
19. NOXONTOWN
20. OLD ST. ANNE'S CHURCH
21. ACHMESTER
22. APPOQUINIMINK FRIENDS MEETINGHOUSE
23. CORBIT-SHARP HOUSE
24. ODESSA HISTORIC DISTRICT
25. OLD DRAWYERS CHURCH

25A. OLD ST. PAUL CHURCH

26. DUNCAN BEARD SITE
27. HELL ISLAND SITE
28. COMDR. THOMAS MACDONOUGH HOUSE
29. SERECK SHALLCROSS HOUSE
30. WILLIAMS HOUSE
31. MONTEREY
32. PORT PENN HISTORIC DISTRICT
33. ASHTON HISTORIC DISTRICT
34. AUGUSTINE BEACH HOTEL
35. DILWORTH HOUSE
36. HAZEL GLEN
37. LISTON RANGE REAR LIGHT STATION
38. JOHN B. NELSON HOUSE
39. BRICK STORE
40. CLEARFIELD FARM
41. FLEMING HOUSE
42. BLOOMFIELD
43. ROY HOUSE
44. SUTTON HOUSE

44A. VERNACULAR FRAME HOUSE

45. BIDDLE HOUSE
46. W. CASEPERSON HOUSE
47. LINDEN HILL
48. MCCOY HOUSE
49. ST. GEORGE'S CEMETERY AND CARETAKER'S HOUSE

49A. STARL HOUSE

50. HART HOUSE
51. HUGUENOT HOUSE (HOMESTEAD FARM, NAUDAIN HOUSE)
52. LISTON HOUSE
53. DRAGON RUN FARM
54. THOMAS SUTTON HOUSE (NEWBERRY)

HISTORIC SITES ELIGIBLE FOR LISTING ON THE NATIONAL REGISTER OF HISTORIC PLACES

A. DELAWARE CITY HISTORIC DISTRICT
B. ST. GEORGE'S HISTORIC DISTRICT
C. TOWNSEND HISTORIC DISTRICT
D. RANGE REAR LIGHTHOUSE

1 0 1 2 3
MILES

1 0 1 2 3
KILOMETERS

HOPE CREEK GENERATING STATION
ENVIRONMENTAL REPORT

OPERATING LICENSE STAGE

HISTORIC SITES WITHIN 10 KILOMETERS (16 MILES) OF SITE

FIGURE 2.6 - 1 AMEND. 4 6/84

CHAPTER 3

THE STATION

3.1 EXTFRNAL APPEARANCE

3.1.1 PHYSICAL APPEARANCE

PSE&G discussed the external appearance of the station during the construction permit stage. The external appearance was also described in the FES. The most significant appearance change to date has been the elimination of the Unit 2 cooling tower and the reactor building containment.

The following section is a combination of updated information and relevant material previously reported.

The station consists of one 1,067 megawatt nuclear generating unit with associated facilities.

Figure 3.1-1 shows an cblique graphic representation of the completed station. Figures 3.1-2 and 3.1-3 show the off-site appearance of the station from two accessible areas: from the intersection of the Artificial Island access road with Alloway Creek Neck Road, and from the Delaware River shipping channel approximately 1.6 kilometers (one mile) off shore, respectively.

The principal building at the station is a rectangular turbine building approximately 111 meters (364 feet) long in a north-south direction and 59 meters (195 feet) wide in an east-west direction. The building extends approximately 29 meters (96 feet) above grade. The turbine building is adjoined by the former Unit 2 turbine building, a portion of which is utilized as the administration facility, and the auxiliary building.

The T-shaped auxiliary building is subdivided into a radwaste/service area and a control/diesel generator area. The radwaste/service area is a rectangular structure approximately 168 meters (550 feet) long in a north-south direction and 27 meters (88 feet) wide in an east-west direction. The radwaste/service area extends approximately 21 meters (69 feet) above grade. The radwaste/service area is adjoined by the control/diesel generator area, reactor building, administration facility and turbine building. The control/diesel generator area is approximately 73 meters (241 feet) long in an east-west direction and 50 meters (165 feet) wide in a north-south direction. The building extends approximately 29 meters (96 feet) above grade. The control/diesel generator area is adjoined by the reactor building, the radwaste/service area and the former Unit 2 reactor building.

The reactor building has a diameter approximately 50 meters (165 feet) across, extends 61 meters (200 feet) above grade, and is 59 meters (193 feet) wide in a north-south direction and 68 meters (224 feet) wide in an east-west direction. The reactor building is bounded by the control/diesel generator area and the radwaste/service area.

The rectangular service water intake structure extends 34 meters (112 feet) in a north-south direction and 23 meters (75 feet) in an east-west direction. It rises approximately 11 meters (35 feet) above grade, and is located approximately 244 meters (800 feet) west of the reactor building. The intake structure is bordered on each side by a cellular cofferdam extending 15 meters (50 feet) to the south and 30 meters (100 feet) to the north.

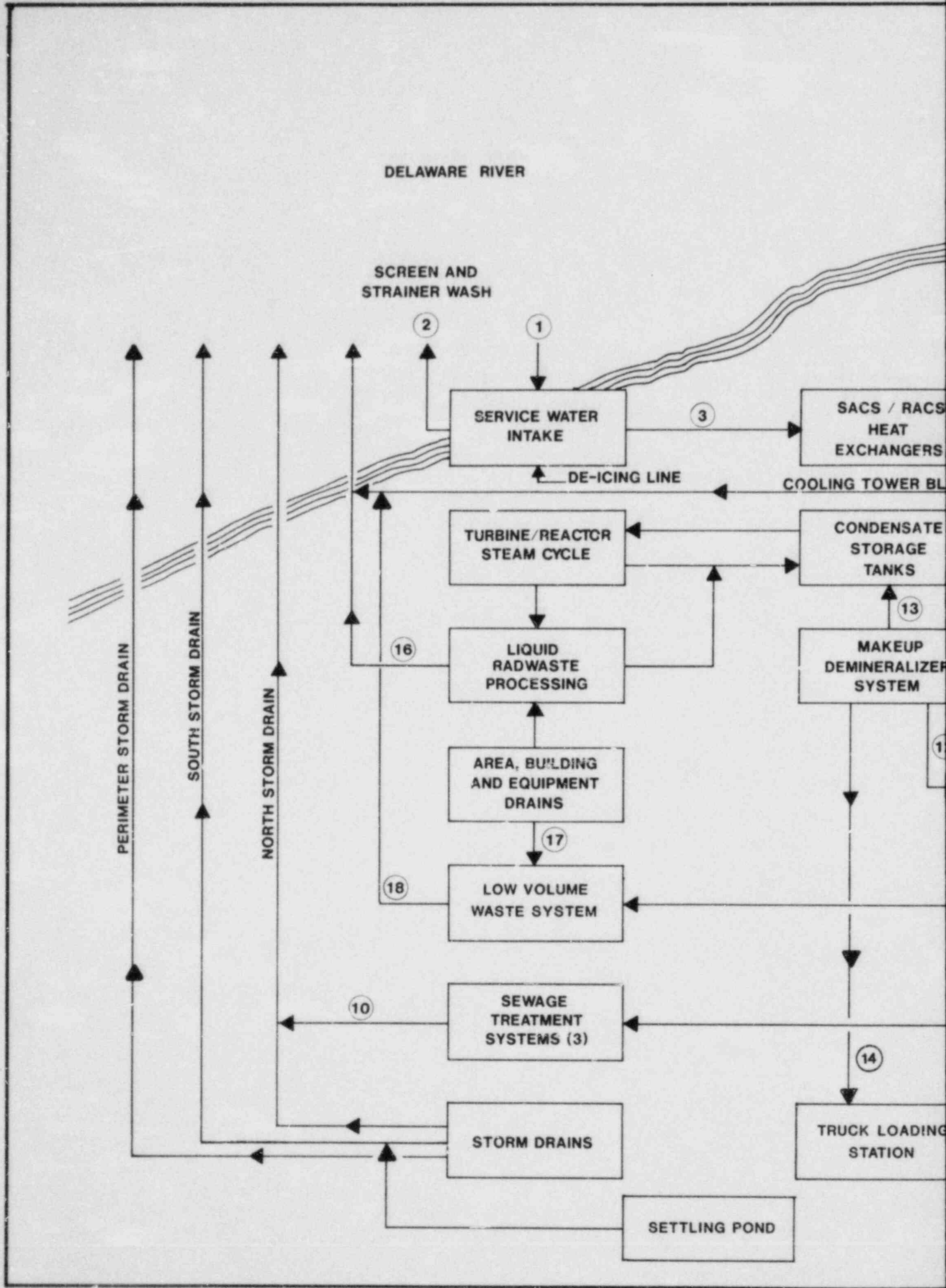
The hyperbolic natural draft cooling tower is the most prominent feature on Artificial Island. Its base diameter and height above nominal plant grade are approximately 132 meters (432 feet) and 157 meters (516 feet), respectively.

The switchyard, which is located approximately 107 meters (350 feet) east of the turbine building, measures 966 meters (600 feet) in a north-south direction and 229 meters (750 feet) in an east-west direction.

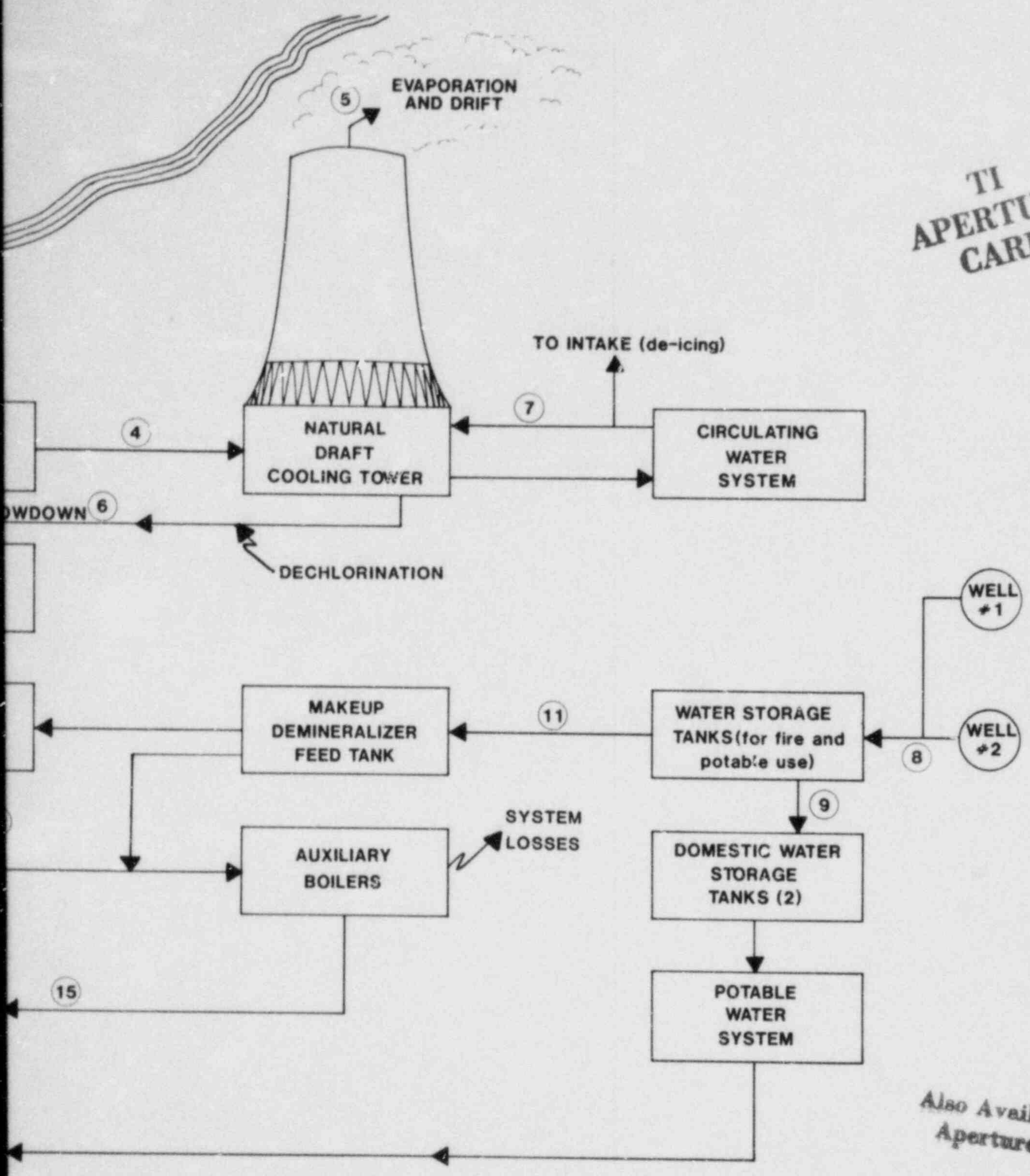
The auxiliary boiler building is 30 meters (100 feet) long in the east-west direction and 28 meters (93 feet) long in the north-south direction. The main portion of the building extends approximately 7 meters (23 feet) above grade. The auxiliary boiler building lies 91 meters (300 feet) north of the administration facility.

The Emergency Operation Facility (EOF) is located offsite at the Nuclear Training Center, Salem, New Jersey. 4

Access to HCGS is achieved by an 8.5 kilometer (5.3 mile) road that connects with Alloway Creek Neck Road about 4.8 kilometers (three miles) east of the site. A main gate and guardhouse facility at the intersection of the fence area with the access road controls entry to station.



DELAWARE RIVER
SCREEN AND STRAINER WASH
2
1
SERVICE WATER INTAKE
3
SACS / RACS HEAT EXCHANGERS
DE-ICING LINE
COOLING TOWER BL
TURBINE/REACTOR STEAM CYCLE
CONDENSATE STORAGE TANKS
13
LIQUID RADWASTE PROCESSING
16
MAKEUP DEMINERALIZER SYSTEM
PERIMETER STORM DRAIN
SOUTH STORM DRAIN
NORTH STORM DRAIN
AREA, BUILDING AND EQUIPMENT DRAINS
17
18
LOW VOLUME WASTE SYSTEM
10
SEWAGE TREATMENT SYSTEMS (3)
14
STORM DRAINS
TRUCK LOADING STATION
SETTLING POND



HOPE CREEK GENERATING STATION
ENVIRONMENTAL REPORT

OPERATING LICENSE STAGE

STATION WATER USE

FIGURE 3.3 - 1 AMEND. 4 6/84

TABLE 3.4-5

SERVICE WATER INTAKE STRUCTURE FEATURES

PARAMETERS	AT CP STAGE	AT OL STAGE	
(1) Number of structures	One	No change	
(2) Location	Shoreline - west of reactor building	No change	
(3) Service	To cool RACS and SACS heat exchangers and provide cooling tower makeup	No change	
(4) Dilution bypass	Portion of service water (approximately 40%) which bypasses the SWS and is used for dilution of discharge	Eliminated	E291.4
(5) Service water pumps	Eight (8) pumps (4 per unit) rated at 56,800 liters/minute (15,000 gallons/minute)	Four (4) pumps rated at 62,450 liters/minute (16,500 gallons/minute)	
(6) Flow rate per unit	160,900 liters/minute (42,500 gallons/minute)	124,400 liters/minute (32,860 gallons/minute)	
(7) Traveling screens Through-screen water velocity: Wire mesh size:	Eight (8) vertical screens 0.15 meter/second (0.50 foot/second) 0.95 centimeter x 0.95 centimeter (3/8 inch x 3/8 inch)	Four (4) vertical screens 0.12 meter/second (0.40 foot/second) 1.27 centimeter x 0.32 centimeter (1/2 inch x 1/8 inch)	4
(8) Deicing capability	None	As described in Section 3.4-1	
(9) Fish return system	None	As described in Section 3.4-1	

TABLE 3.4-9

DISCHARGE WATER SYSTEM FEATURES

PARAMETER	AT CP STAGE	AT OL STAGE
(1) Discharge point upstream of intake structure	300 meters (1000 feet)	160 meters (460 feet)
(2) Discharge point off shoreline	60 meters (200 feet)	3 meters (10 feet)
(3) Discharge pipe diameter	1.4 meters (4.5 feet)	1.2 meters (4.0 feet)
(4) Blowdown rate (per unit)	45,200 liters/minute[1] (12,000 gallons/minute)	79,400 liters/minute (21,360 gallons/minute)
(5) Average discharge water temperature rise	Winter 6.2°C (11.2°F) Summer 3 to 7°C (6.6°F)	14.4°C (26.4°F) 3.0°C (5.2°F)
(6) Discharge velocity	260 centimeters/second (8.5 feet/second) (two units)	110 centimeters/second (3.5 feet/second)
(7) Discharge water temperature rise (coldest month)	7.8°C (14°F)	19.6°C (35.5°F)

E291.4

4

(1) Plus bypass flow of approximately 18,500 gallons/minute per unit

Table 3.5-7 gives the assumptions and parameters used to calculate the yearly activity releases. The yearly activity releases for each waste stream and the total appear in Table 3.5-17.

The processed liquid radwaste that is not recycled in the plant is discharged into the cooling tower blowdown line on a batch basis, at flow rates of up to 666 liters per minute (176 gallons per minute) for the low purity waste processing system, and 95 liters per minute (25 gallons per minute) for the laundry drain waste processing system. No pump flows are given for discharges from the high purity, chemical or regenerant waste subsystems since it is not planned to actually dis- 3
charge any of those streams. Flow is controlled by a flow control valve; therefore, the actual flow could be substantially less.

The minimum monthly total cooling tower blowdown flow of 72,000 liters per minute (19,000 gallons per minute) dilutes the above discharge rates by at least a factor of 100 for the low purity waste, and by 750 for the laundry waste streams. The instrument used to measure the cooling tower blowdown flow is an ultrasonic level gage located near the cooling tower basin weir. The level gage measures the level in the basin and converts the height above the weir into cooling tower blowdown flow. This signal is transmitted to the LR-RMS local radiation processor where it is combined with the measurement from the radiation element in the LWMS discharge line to 3
calculate the final diluted concentration. When the cooling tower blowdown flow is below the minimum setpoint, the signal initiates the closing of the LWMS discharge line isolation valve. This dilution occurs within the site boundary; the dilution is used in determining specific activity concentrations for the releases. These concentrations and a comparison to 10 CFR 20 limits appear in Table 3.5-18.

No actual leak detection methods have been employed but several design measures have been implemented to preclude leakage or the consequences of any leakage. These measures include: the use of stainless steel piping, sampling the rad-waste tanks prior to discharge and discharging only neutral 2
(pH 7 to 10) liquids to minimize the internal pipe corrosion process, hydrostatically testing the pipe prior to burying it, burying the pipe in granular bedding or sandcrete, and supplying the piping with impressed current cathodic protection to preclude external galvanic type corrosion.

3.5.2.4 Estimated Doses

To ensure compliance with Appendix I of 10 CFR Part 50, dose
calculations, based on the liquid source terms described
above, are performed in accordance with Regulatory Guide 1.109 1
by use of the USNRC computer code LADTAP II. For these pur-
poses doses are calculated for a maximum individual consuming
aquatic biota and receiving shoreline exposure at the edge of
the initial mixing zone. There is no potable water or irriga-
tion pathway for liquid effluents from HCGS. Table 3.5-19
gives input data for these calculations. The calculated doses
are 0.0265 mrem per year to the total body of an adult and 1 4
0.383 mrem per year to the bone of a child. These doses are
well within the Appendix I design guides of 3.0 and 10.0 mrem
per year to the total body and any organ, respectively.

Total man-rem and man-thyroid-rem dose to the 80 kilometer (50
mile) population from liquid effluents from Hope Creek Gen-
erating Station are estimated to be 0.255 and 0.754, respec- 4
tively. Using the methodology presented in Regulatory Guide
1.110, additional equipment can be justified if its total
annual cost is less than one thousand 1975 dollars per man-rem
or man-thyroid-rem saved. The smallest total annual cost per
man-rem or man-thyroid-rem saved (even assuming that the
equipment would totally eliminate all 80 kilometer (50 mile) 2
population doses) is estimated to be $14,500 (1975). Since
this is greater than $1,000 (1975), it is concluded that no
additional equipment can be justified. Thus the liquid waste
management system is judged to be designed in accordance with
the applicable position of Appendix I to CFR 50.

3.5.3 GASEOUS RADWASTE SYSTEMS

The gaseous waste management systems include all systems that process potential sources of airborne releases of radioactive material during normal operation and anticipated operational occurrences. Included are the offgas system and various ventilation systems. These systems reduce radioactive gaseous releases from the plant by filtration or delay, which allows decay of radioisotopes prior to release.

		ITEM	VALUE OR REFERENCE	SOURCE
LIQUID GALE CARDS				2
0.632	0.333	2.0 1.0E-25 092382 1 0 0		
CARD 1	NAME	NAME OF REACTOR: HCGS		TYPE = BWR
CARD 2	POWTH	THERMAL POWER LEVEL (MEGAWATTS)		3458
CARD 3	GTO	TOTAL STEAM FLOW (MILLION LBS/HR)		14.0
CARD 4	WL1O	MASS OF WATER IN REACTOR VESSEL (MILLION LBS)		0.38
CARD 5	GDE	CLEAN-UP DEMINERALIZER FLOW (MILLION LBS/HR)		0.13
CARD 6	REGENT	CONDENSATE DEMINERALIZER REGENERATION TIME (DAYS)		30.0
CARD 7	FFCDM	FRACTION FEED WATER THROUGH CONDENSATE DEMIN		1.00 |4
CARD 8		HIGH PURITY WASTE INPUT 32359. GPD AT .136 PCA		
CARD 9		DFI = 1.0E02DFCS = 1.0E01DFO = 1.0E02		
CARD 10		COLLECTION 0.761 DAYS PROCESS 0.0895DAYS FRACT DISCH		0.01
CARD 11		LOW PURITY WASTE INPUT 5700. GPD AT .001		
CARD 12		DFI = 1.0E02DFCS = 2.0E00DF0 = 1.0E02		
CARD 13		COLLECTION 2.105 DAYS PROCESS 0.0718DAYS FRACT DISCH		0.5
CARD 14		CHEMICAL WASTE INPUT 600. GPD AT .02 PCA		
CARD 15		DFI = 1.0E00DFCS = 1.0E00DFO = 1.0E00		
CARD 16		COLLECTION 2.667 DAYS PROCESS .655 DAYS FRACT DISCH		0.1
CARD 17		REGENERATION SOLTNS INPUT GPD		6285.0
CARD 18		DFI = 1.0E03DFCS = 1.0E04DFO = 1.0E04		
CARD 19		COLLECTION 3.18 DAYS PROCESS .437 DAYS FRACT DISCH		0.1
CARD 20	GGS	GLAND SEAL STEAM FLOW (THOUSAND LBS/HR)		0.0
CARD 21	TIM3	GLAND SEAL HOLDUP TIME (HOURS)		0.0
CARD 22	TIM4	AIR EJECTOR OFFGAS HOLDUP TIME (HOURS)		0.17
CARD 23		CONTAINMENT BLDG. CHARCOAL 00.0 HEPA?99.0		
CARD 24		TURBINE BLDG. CHARCOAL 00.0 HEPA?00.0		
CARD 25	FIL3	GLAND SEAL VENT, IODINE PF		00.0
CARD 26	FIL4	AIR EJECTOR OFFGAS IODINE PF		1.0
CARD 27		AUXILIARY BLDG. CHARCOAL 00.0 HEPA?99.0		
CARD 28		RADWASTE BLDG. CHARCOAL 70.0 HEPA?99.0		
CARD 29	KCHAR	CHARCOAL DELAY SYSTEM 0=NO,1=YES,2=CRYOGENIC DISTILL		1.0
CARD 30	KKR	KRYPTON DYNAMIC ADSORPTION COEFFICIENT (CM3/GM)		18.5
CARD 31	KXE	XENON DYNAMIC ADSORPTION COEFFICIENT (CM3/GM)		330.0
CARD 32	KMASS	MASS OF CHARCOAL (THOUSAND LBS)		322.0
CARD 33	PFLAUN	DETERGENT WASTE DECONTAMINATION FACTOR		1.0

TABLE 3.5-11

EXPECTED HOLDUP TIME FOR COLLECTION, PROCESSING AND DISCHARGE USED FOR EVALUATION OF COMPLIANCE WITH APPENDIX I OF 10 CFR 50

Process	Holdup Time (Days)	
I. HIGH PURITY WASTE SUBSYSTEM		
a. Collection	0.761	
b. Processing	0.0895	
c. Discharge Time	0.0	
d. Total	0.851	
II. LOW PURITY WASTE SUBSYSTEM		
a. Collection	2.105	
b. Processing	0.0473	
c. Discharge Time	0.0245 (1)	
d. Total	2.177	
III. CHEMICAL WASTE SUBSYSTEM		
a. Collection	2.667	4
b. Processing	0.655	
c. Discharge Time	0.0	
d. Total	3.322	4
IV. REGENERANT WASTE SUBSYSTEM		
a. Collection	3.18	
b. Processing	0.437	
c. Discharge Time	0.0	
d. Total	3.62	

(1) NUREG-0016, Rev. 1 recommends the use of T = (T processing + 1/2 T discharge) for the sum of processing and discharge time entry. This value of 0.0245 for discharge is 1/2 T discharge.

TABLE 3.5-12

AVERAGE DAILY INPUTS AND ACTIVITIES TO THE LIQUID WASTE MANAGEMENT SYSTEM

Source	Expected Daily Input Flow Rate (gal/day)	Fraction of Primary Coolant (PCA) (1)	
I. HIGH PURITY WASTE SUBSYSTEM			
Equipment Drains			
- Drywell	3400(1)	1.00	
- Reactor Building	3700(1)	0.1	
- Radwaste Area	1100(1)	0.1	
- Turbine Building	3000(1)	0.001	
Ultrasonic Resin Cleaner	10212	0.05	
Resin Rinse	8979	0.002	4
Clean-up Phase Separator	640(1)	0.002	
Radwaste Demineralizer Regeneration	1328	0.003	
Total	32359	0.136	4
II. LOW PURITY WASTE SYSTEM			
Floor Drains			
- Drywell	700(1)	0.001	
- Reactor Building	2000(1)	0.001	
- Radwaste Area	1000(1)	0.001	
- Turbine Building	2000(1)	0.001	
Total	5700	0.001	
III. CHEMICAL WASTE SYSTEM			
Lab Drains	500(1)	0.02	
Chemical Lab Waste	100(1)	0.02	
Total	600	0.02	
IV. REGENERANT WASTE SYSTEM	6285	(2)	
V. DETERGENT WASTE SUBSYSTEM	1000(1)	-	

(1) Obtained from NUREG-0016 Revision 1.
(2) Calculated by the GALE Code.

EXPECTED YEARLY ACTIVITY RELEASED FROM LIQUID WASTE MANAGEMENT SUBSYSTEMS
FOR EVALUATION OF COMPLIANCE WITH APPENDIX I OF 10 CFR 50 (Ci)

	High Purity Waste Processing Stream	Low Purity Waste Processing Stream	Chemical Waste Processing Stream	Subtotal	Adjusted Total	Detergent Wastes	Total	
CORROSION AND ACTIVATION PRODUCTS								
Na-24	3.5E-3	1.3E-4	2.4E-3	6.0E-3	9.3E-3	0	9.3E-3	
P-32	1.1E-4	6.9E-6	3.4E-4	4.6E-4	7.0E-4	0	7.0E-4	
Cr-51	3.4E-3	2.1E-4	1.1E-2	1.5E-2	2.3E-2	0	2.3E-2	
Mn-54	3.9E-5	2.6E-6	1.5E-4	1.9E-4	3.0E-4	1.0E-3	1.3E-3	
Mn-56	3.4E-3	8.9E-5	6.8E-5	3.5E-3	5.4E-3	0	5.4E-3	
Fe-55	5.6E-4	3.7E-5	2.2E-3	2.8E-3	4.3E-3	0	4.3E-3	
Fe-59	1.7E-5	1.1E-6	6.0E-5	7.8E-5	1.2E-4	0	1.2E-4	
Co-58	1.1E-4	7.2E-6	4.1E-4	5.3E-4	8.2E-4	4.0E-3	4.8E-3	4
Co-60	2.3E-4	1.5E-5	8.8E-4	1.1E-3	1.7E-3	8.7E-3	1.0E-2	
Ni-65	2.0E-5	5.3E-7	3.9E-7	2.1E-5	3.2E-5	0	3.2E-5	
Cu-64	9.7E-3	3.5E-4	5.6E-3	1.6E-2	2.4E-2	0	2.4E-2	
Zn-65	1.1E-4	7.3E-6	4.3E-4	5.5E-4	8.5E-4	0	8.5E-4	
Zn-69m	6.7E-4	2.5E-5	4.2E-4	1.1E-3	1.7E-3	0	1.7E-3	
Zn-69	7.1E-4	2.6E-5	4.5E-4	1.2E-3	1.8E-3	0	1.8E-3	
Zr-95	0	0	0	0	0	1.4E-3	1.4E-3	
Nb-95	0	0	0	0	0	2.0E-3	2.0E-3	
W-187	1.2E-4	5.5E-6	1.3E-4	2.6E-4	4.1E-4	0	4.1E-4	
Np-239	3.5E-3	1.9E-4	6.4E-3	1.0E-2	1.5E-2	0	1.5E-2	
FISSION PRODUCTS								
Br-83	2.3E-4	6.0E-6	3.5E-6	2.4E-4	3.6E-4	0	3.6E-4	4
Br-84	8.8E-6	3.6E-7	1.3E-13	9.1E-6	1.4E-5	0	1.4E-5	
Sr-89	5.7E-5	3.7E-6	2.0E-4	2.6E-4	4.1E-4	0	4.1E-4	
Sr-90	4.0E-6	2.6E-7	1.5E-5	2.0E-5	3.0E-5	–	3.0E-5	
Y-90	4.5E-7	6.2E-8	8.9E-6	9.4E-6	1.4E-5		1.4E-5	
Sr-91	1.1E-3	3.5E-5	4.4E-4	1.6E-3	2.4E-3	0	2.4E-3	
Y-91m	7.0E-4	2.2E-5	2.8E-4	1.0E-3	1.5E-3	0	1.5E-3	

	High Purity Waste Processing Stream	Low Purity Waste Processing Stream	Chemical Waste Processing System	Subtotal	Adjusted Total	Detergent Wastes	Total
FISSION PRODUCTS (Continued)							
Y-91	3.1E-5	2.2E-6	1.4E-4	1.7E-4	2.6E-4	0	2.6E-4
Sr-92	7.2E-4	1.9E-5	1.8E-5	7.6E-4	1.2E-3	0	1.2E-3
Y-92	1.7E-3	4.4E-5	1.7E-4	1.9E-3	2.9E-3	0	2.9E-3
Y-93	1.1E-3	3.7E-5	4.9E-4	1.7E-3	2.6E-3	0	2.6E-3
Zr-95	4.5E-6	2.9E-7	1.6E-5	2.1E-5	3.3E-5	0	3.3E-5
Nb-95	4.5E-6	2.9E-7	1.7E-5	2.2E-5	3.4E-5	0	3.4E-5
Nb-98	2.8E-5	9.4E-7	3.4E-10	2.9E-5	4.5E-5	0	4.5E-5
Mo-99	1.0E-3	5.6E-5	2.0E-3	3.1E-3	4.7E-3	0	4.7E-3
Tc-99m	4.4E-3	1.5E-4	2.6E-3	7.1E-3	1.1E-2	0	1.1E-2
Ru-103	1.1E-5	7.2E-7	3.9E-5	5.1E-5	7.9E-5	1.4E-4	2.2E-4
Rh-103m	1.1E-5	7.2E-7	4.0E-5	5.1E-5	7.9E-5	0	7.9E-5
Tc-104	8.3E-6	5.3E-7	1.5E-19	8.9E-6	1.4E-5	0	1.4E-5
Ru-105	2.8E-4	7.3E-6	2.7E-5	3.1E-4	4.8E-4	0	4.8E-4
Rh-105m	2.8E-4	7.3E-6	2.7E-5	3.1E-4	4.8E-4	0	4.8E-4
Rh-105	9.4E-5	5.3E-6	1.8E-4	2.8E-4	4.3E-4	0	4.3E-4
Ru-106	1.7E-6	1.1E-7	6.5E-6	8.3E-6	1.3E-5	2.4E-3	2.4E-3
Rh-106	1.7E-6	1.1E-7	6.5E-6	8.3E-6	1.3E-5	0	1.3E-5
Ag-110m	5.6E-6	3.6E-8	2.2E-6	2.8E-6	4.2E-6	4.4E-4	4.4E-4
Te-129m	2.2E-5	1.4E-6	7.8E-5	1.0E-4	1.6E-4	0	1.6E-4
Te-129	1.4E-5	9.2E-7	5.0E-5	6.5E-5	1.0E-4	0	1.0E-4
Te-131m	4.4E-5	2.1E-6	5.7E-5	1.0E-4	1.6E-4	0	1.6E-4
Te-131	8.1E-6	3.8E-7	1.0E-5	1.9E-5	2.9E-5	0	2.9E-5
I-131	9.9E-3	6.1E-5	6.6E-2	6.7E-2	1.0E-1	6.2E-5	1.0E-1
Te-132	5.1E-6	2.9E-7	1.1E-5	1.6E-5	2.5E-5	0	2.5E-5
I-132	2.1E-3	5.7E-5	3.9E-5	2.2E-3	3.4E-3	0	3.4E-3
I-133	1.0E-2	4.3E-4	1.8E-2	2.9E-2	4.4E-2	0	4.4E-2
I-134	5.8E-4	1.9E-5	1.0E-8	6.0E-4	9.1E-4	0	9.1E-4

3

4

	High Purity Waste Processing Stream	Low Purity Waste Processing Stream	Chemical Waste Processing System	Subtotal	Adjusted Total	Detergent Wastes	Total
FISSION PRODUCTS (CONTINUED)							
Cs-134	1.7E-4	5.5E-5	5.7E-5	2.8E-4	4.3E-4	1.3E-2	1.3E-2
I-135	5.7E-3	1.6E-4	1.3E-3	7.1E-3	1.1E-2	0	1.1E-2
Cs-136	4.4E-4	1.4E-4	1.2E-4	7.0E-4	1.1E-3	0	1.1E-3
Cs-137	1.1E-4	3.7E-5	3.8E-5	1.9E-4	2.9E-4	2.4E-2	2.4E-2
Ba-137m	1.1E-4	3.4E-5	3.6E-5	1.8E-4	2.7E-4	0	2.7E-4
Cs-138	1.6E-4	3.4E-5	3.1E-13	2.0E-4	3.0E-4	0	3.0E-4
Ba-139	2.2E-4	6.5E-6	1.9E-7	2.3E-4	3.5E-4	0	3.5E-4
Ba-140	2.2E-4	1.4E-5	6.6E-4	9.0E-4	1.4E-3	0	1.4E-3
La-140	3.9E-5	4.9E-6	4.3E-4	4.7E-4	7.3E-4	0	7.3E-4
La-141	1.0E-4	2.7E-6	7.5E-6	1.1E-4	1.7E-4	0	1.7E-4
Ce-141	1.9E-5	1.2E-6	6.7E-5	8.6E-5	1.3E-4	0	1.3E-4 4
La-142	1.6E-4	4.6E-6	2.7E-7	1.7E-4	2.5E-4	0	2.5E-4
Ce-143	1.4E-5	6.6E76 3	1.9E-5	3.3E-5	5.0E-5	0	5.0E-5
Pr-143	2.2E-5	1.4E-6	7.1E-5	9.5E-5	1.5E-4	0	1.5E-4
Ce-144	1.7E-6	1.1E-7	6.5E-6	8.3E-6	1.3E-5	5.2E-3	5.2E-3
Pr-144	1.7E-6	1.1E-7	6.5E-6	8.3E-6	1.3E-5	0	1.3E-5
ALL OTHERS	1.4E-5	1.4E-6	1.3E-5	2.8E-5	4.3E-5	0	4.3E-5
TOTAL (Except Tritium)	5.9E-2	2.6E-3	1.3E-1	1.9E-1	2.9E-1	6.2E-2	3.5E-1
Tritium Release							26

TABLE 3.5-18 (Page 1 of 3)

EXPECTED ACTIVITY CONCENTRATIONS (uCi/ml)
FOR EVALUATION OF RADIOACTIVE RELEASES TO THE
DELAWARE RIVER

Isotope	Concentration (uCi/ml)(1)	MPC (uCi/ml) 10CFR20 Table II, Col. 2	Fraction of MPC	
Na-24	4E-9	2E-4	2E-5	4
P-32	2E-10	2E-5	1E-5	
Cr-51	8E-9	2E-3	4E-6	4
Mn-54	4E-10	1E-4	4E-6	
Mn-56	2E-9	1E-4	2E-5	4
Fe-55	1E-9	8E-4	1E-6	
Fe-59	4E-11	6E-5	7E-7	
Co-58	2E-9	1E-4	2E-5	
Co-60	3E-9	5E-5	6E-5	
Ni-65	1E-11	1E-4	1E-7	4
Cu-64	8E-9	3E-4	3E-5	
Zn-65	3E-10	1E-4	3E-6	
Zn-69m	6E-10	7E-5	9E-6	
Zn-69	6E-10	2E-3	3E-7	
W-187	1E-10	7E-5	1E-6	
Np-239	5E-9	1E-4	5E-5	4
Br-83	1E-10	3E-6	3E-5	
Br-84	5E-12	3E-6	2E-6	4
Sr-89	1E-10	3E-6	3E-5	
Sr-90	1E-11	3E-7	3E-5	
Y-90	5E-12	2E-5	3E-7	
Sr-91	8E-10	7E-5	1E-5	
Y-91m	5E-10	3E-3	2E-7	4
Y-91	9E-11	3E-5	3E-6	
Sr-92	4E-10	7E-5	6E-6	
Y-92	1E-9	6E-5	2E-5	
Y-93	9E-10	3E-5	3E-5	4
Zr-95	5E-10	6E-5	8E-6	
Nb-95	7E-10	1E-4	7E-6	
Nb-98	1E-11	3E-6	3E-6	
Mo-99	2E-9	2E-4	1E-5	4

(1)See page 3.

TABLE 3.5-18 (Continued) (Page 2 of 3)

Isotope	Concentration (uCi/ml)(1)	MPC (uCi/ml) 10CFR20 Table II, Col. 2	Fraction of MPC	
Tc-99m	4E-9	6E-3	7E-7	4
Ru-103	7E-11	8E-5	9E-7	
Rh-103m	3E-11	1E-2	3E-9	4
Tc-104	5E-12	3E-6	2E-6	
Ru-105	2E-10	1E-4	2E-6	
Rh-105m	2E-10	3E-6	7E-5	
Rh-105	1E-10	1E-4	1E-6	
Ru-106	8E-10	1E-5	8E-5	
Rh-106	4E-12	3E-6	1E-6	
Ag-110m	1E-10	3E-5	3E-6	
Te-129m	5E-11	3E-5	2E-6	
Te-129	3E-11	8E-4	4E-8	
Te-131m	5E-11	6E-5	8E-7	4
Te-131	1E-11	3E-6	3E-6	
I-131	3E-8	3E-7	1E-1	
Te-132	8E-12	3E-5	3E-7	
I-132	1E-9	8E-6	1E-4	
I-133	1E-8	1E-6	1E-2	4
I-134	3E-10	2E-5	2E-5	
Cs-134	4E-9	9E-6	4E-4	
I-135	4E-9	4E-6	1E-3	
Cs-136	4E-10	9E-5	4E-6	4
Cs-137	8E-9	2E-5	4E-4	
Ba-137m	9E-11	3E-6	3E-5	
Cs-138	1E-10	3E-6	3E-5	
Ba-139	1E-10	3E-6	3E-5	
Ba-140	5E-10	2E-5	3E-5	4
La-140	2E-10	2E-5	1E-5	
La-141	6E-11	3E-6	2E-5	4
Ce-141	4E-11	9E-5	4E-7	
La-142	8E-11	3E-6	3E-5	4
Ce-143	2E-11	4E-5	5E-7	
Pr-143	5E-11	5E-5	1E-6	
Ce-144	2E-9	1E-5	2E-4	
Pr-144	4E-12	3E-6	1E-6	
All Others	1E-11	3E-8	3E-4	3 4
H3	9E-6	3E-3	3E-3	
Total	1E-7	-	1E-1	3 2

TABLE 3.5-19 (Page 1 of 4)

INPUT DATA FOR AQUATIC DOSE CALCULATIONS

HOPE CREEK GENERATING STATION - LIQUID DOSE CALCULATIONS

1 42.3 1.0 0 1

5.97E06

HCGS SOURCE TERM - ONE UNIT WITH MULTIPLIER OF 1.0

H 3	26.0	
NA24	0.093	
P 32	0.00070	
CR51	0.023	
MN54	0.0013	
MN56	0.0054	
FE55	0.0043	
FE59	0.00012	
CO58	0.0048	
CO60	0.01	
NI65	0.000032	
CU64	0.024	
ZN65	0.00085	
ZN69M	0.0017	
ZN69	0.0018	
W 187	0.00041	2
NP239	0.015	
BR83	0.00036	
BR84	0.000014	4
SR89	0.00041	
SR90	0.000030	
Y 90	0.000014	2
SR91	0.0024	
Y 91M	0.0015	
Y 91	0.00026	
SR92	0.0012	
Y 92	0.0029	
Y 93	0.0026	
ZR95	0.0014	
NB95	0.002	
NB98	0.000045	
MO99	0.0047	
TC99M	0.011	
RU103	0.00022	
RH103M	0.000079	
TC104	0.000014	
RU105	0.00048	
RH105M	0.00048	
RH105	0.00043	
RU106	0.0024	
RH106	0.000013	

TABLE 3.5-19 (Continued) (Page 2 of 4)

AG110M	0.00044
TE129M	0.00016
TE129	0.000100
TE131M	0.00016
TE131	0.000029
I 131	0.100
TE132	0.000025
I 132	0.0034
I 133	0.044
I 134	0.00091
CS134	0.013
I 135	0.0011
CS136	0.0011
CS137	0.024
BA137M	0.00027
CS138	0.00030
BA139	0.00035
BA140	0.0014
LA140	0.00073
LA141	0.00017
CE141	0.00013
LA142	0.00025
CE143	0.000050
PR143	0.00015
CE144	0.0052
PR144	0.000013

4

1	0.2	10.0	10.0	10.0	10.0	0.0
21.0	5.0	0.0	0.0	12.0	100.0	100.0
16.0	3.8	0.0	0.0	67.0	100.0	100.0
6.9	1.7	0.0	0.0	14.0	100.0	100.0

1862.0	33820	206.7
3453.0	147.0	160.4
4522.0	101.0	122.5
6118.0	11.0	66.9
9310.0	3.9	22.3
11704.0	3.5	16.9
19950.0	6.0	47.4
46284.0	74.0	100.8
77938.0	2289.0	164.0
84854.0	1175.0	232.9

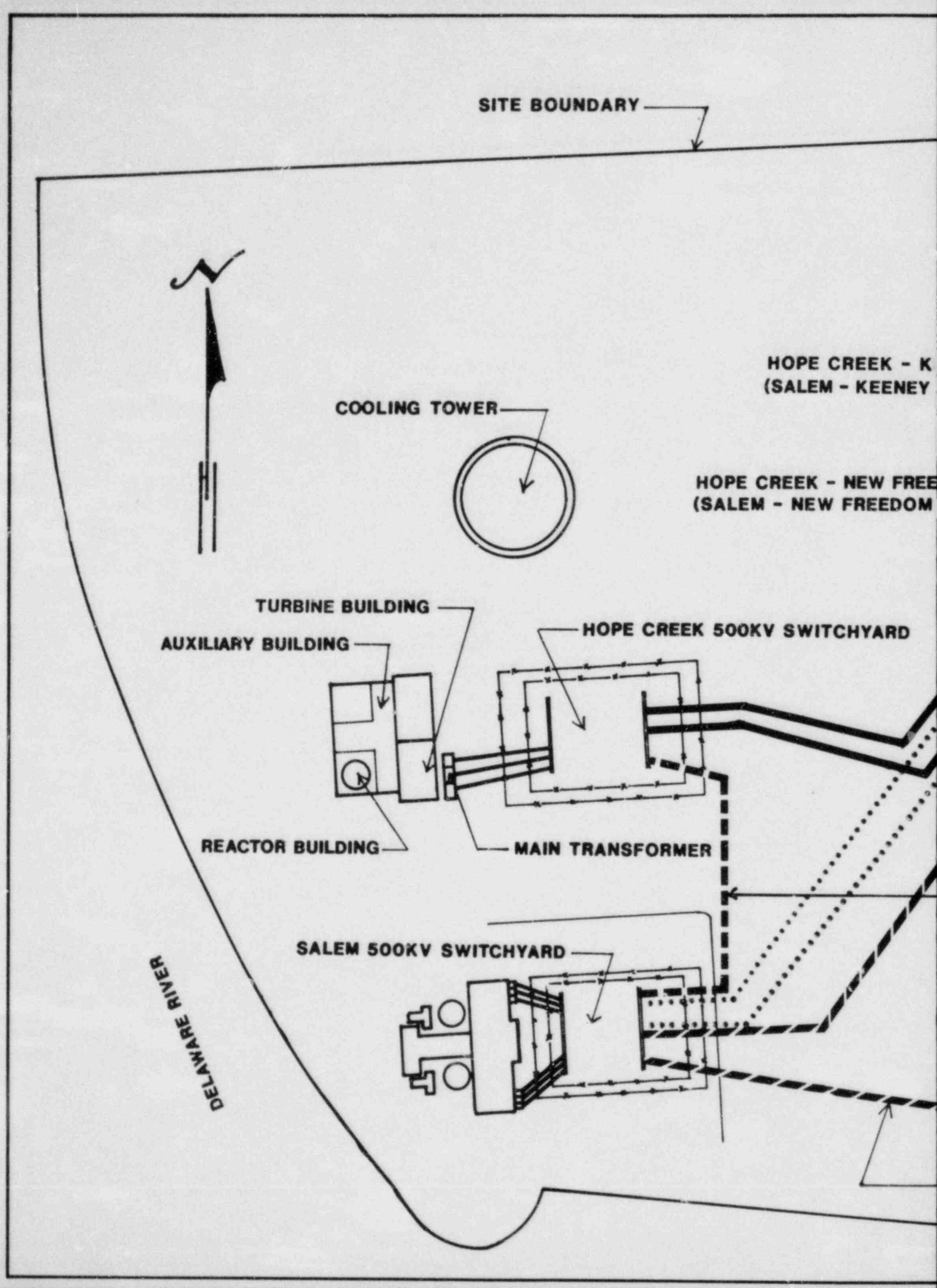
5530.0	33820.0	206.7
10270.0	147.0	160.4
13430.0	101.0	122.5
18170.0	11.0	66.9
27650.0	3.9	22.3

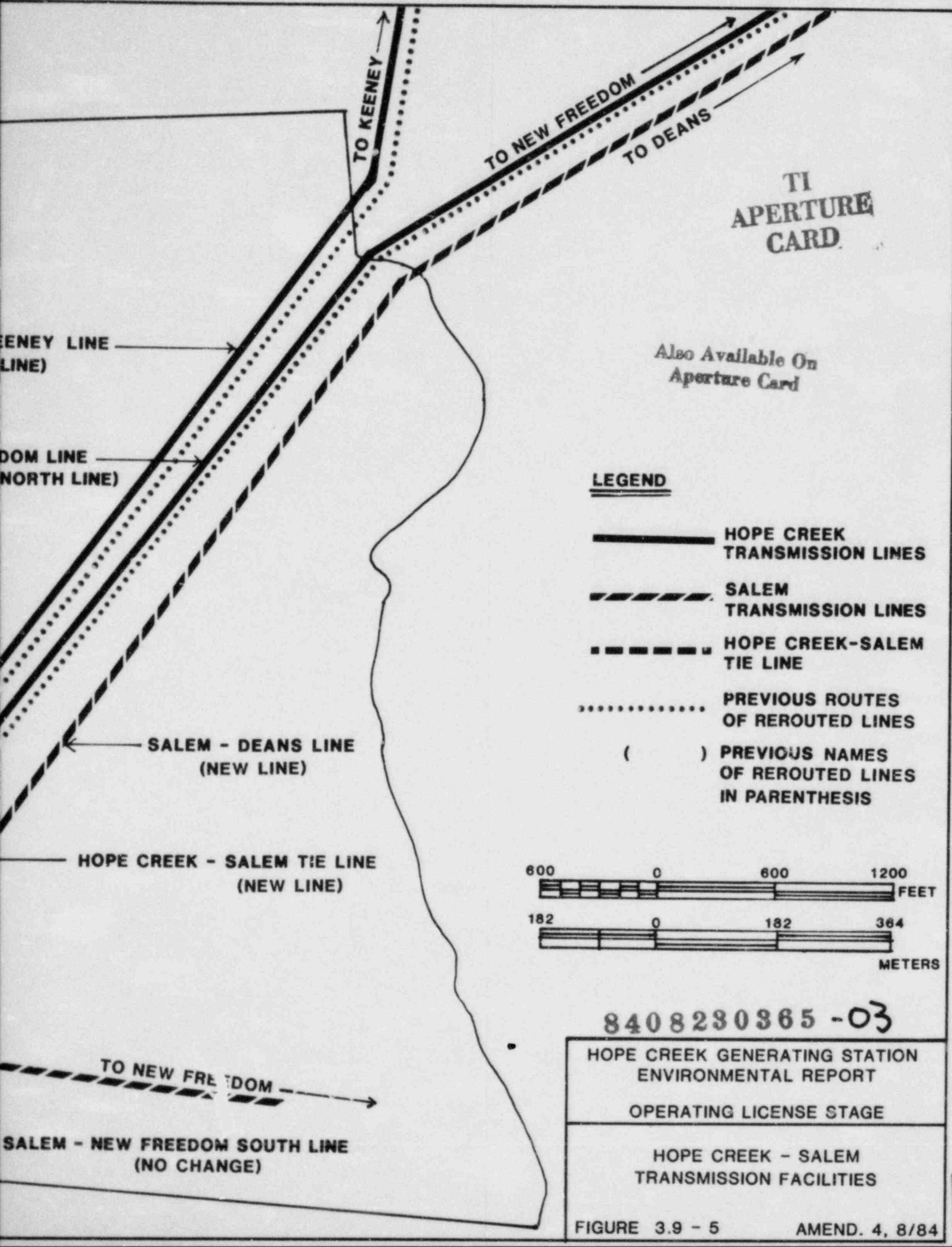
TABLE 3.5-26 (Page 1 of 7)

INPUT DATA FOR ATMOSPHERIC DOSE CALCULATIONS

HOPE CREEK GENERATING STATION-AIR DOSE CALCULATIONS 4

640.0	0.5	0.66	0.5	0.33	8.0	
YEAR 2010 POPULATION DATA FOR HCGS (HCGS FSAR)						
6	10					
N	0.0	0.0	0.0	0.0	0.0	455.0
97200.0	111400.0	117600.0	320500.0			
NNE	0.0	0.0	0.0	0.0	36.0	9802.0
22600.0	148800.0	1198200.0	1306900.0			
NE	0.0	0.0	0.0	7.0	357.0	2268.0
8800.0	53000.0	389200.0	602800.0			
ENE	0.0	0.0	0.0	62.0	89.0	1205.0
7400.0	35300.0	71700.0	47500.0			
E	0.0	0.0	0.0	0.0	0.0	1062.0
24400.0	59100.0	48300.0	28100.0			
ESE	0.0	0.0	0.0	0.0	0.0	509.0
13400.0	19800.0	12700.0	27900.0			
SE	0.0	0.0	0.0	0.0	0.0	45.0
1100.0	1200.0	0.0	33800.0			
SSE	0.0	0.0	0.0	0.0	0.0	191.0
0.0	200.0	700.0	22000.0			
S	0.0	0.0	0.0	0.0	23.0	369.0
13500.0	39100.0	13600.0	4800.0			
SSW	0.0	0.0	0.0	15.0	0.0	229.0
23900.0	14700.0	27200.0	15600.0			
SW	0.0	0.0	0.0	0.0	30.0	691.0
25700.0	5900.0	15400.0	8700.0			
WSW	0.0	0.0	0.0	0.0	15.0	1151.0
20100.0	3300.0	10000.0	10500.0			
W	0.0	0.0	0.0	15.0	38.0	4065.0
16900.0	1300.0	49500.0	259400.0			
WNW	0.0	0.0	0.0	129.0	30.0	534.0
21400.0	23700.0	46400.0	18100.0			
WW	0.0	0.0	0.0	99.0	220.0	915.0
67400.0	30100.0	16400.0	31500.0			
NNW	0.0	0.0	0.0	4.0	296.0	2424.0
62400.0	118700.0	49700.0	41300.0			
HCGS AREA MILK PRODUCTION - DRESDNER 1982 SURVEY						
6	10					
N	0.0	0.0	0.0	0.0	0.0	0.0
2.43E6	1.96E6	2.90E4	4.90E4			
NNE	0.0	0.0	0.0	0.0	1.40E4	2.15E6
8.10E6	3.73E6	2.00E3	4.00E3			
NE	0.0	0.0	0.0	0.0	6.00E3	1.71E6
8.10E6	2.93E6	1.30E6	2.50E6			
ENE	0.0	0.0	0.0	0.0	0.0	6.83E6
5.55E6	4.55E6	1.36E6	2.98E6			


SITE BOUNDARY
HOPE CREEK - K
(SALEM - KEENEY
COOLING TOWER
HOPE CREEK - NEW FREE
(SALEM - NEW FREEDOM
TURBINE BUILDING
AUXILIARY BUILDING
HOPE CREEK 500KV SWITCHYARD
REACTOR BUILDING
MAIN TRANSFORMER
SALEM 500KV SWITCHYARD
DELAWARE RIVER



HOPE CREEK GENERATING STATION
ENVIRONMENTAL REPORT

OPERATING LICENSE STAGE

HOPE CREEK - SALEM
TRANSMISSION FACILITIES

FIGURE 3.9 - 5 AMEND. 4, 8/84

Within each three-month season, the month that contained the worst case condition represented that season in the simulation.

Station discharge temperatures expected to be exceeded less than five percent of the time were used, along with a cooling tower dissolved solids concentration factor of 1.8, which is above anticipated monthly concentrations. Each simulation assumed a constant discharge of 87,000 liters per minute (23,000 gallons per minute).

Maximum river current velocity values of 0.54 meter per second (1.76 feet per second) at maximum flood, and 0.56 meter per second (1.84 feet per second) at maximum ebb, were selected to approximate the frictional drag effect of the shoreline. Delaware River mainstem average maximum velocity in the vicinity is 0.8 meter per second (2.6 feet per second) at maximum flood and 1.0 meter per second (3.2 feet per second) at maximum ebb (Reference 5.1-3).

Section 3.4 presents blowdown discharge characteristics for temperature, dissolved solids and flow. Section 3.4 also provides maximum expected temperatures (to be exceeded less than five percent of the time), ambient temperature and cycles of concentration in the cooling tower blowdown.

Each seasonal simulation was performed for a complete tidal cycle; the resulting thermal plume was plotted for the four tidal stages (low slack, maximum flood, high slack and maximum ebb). Model results indicate that the HCGS discharge is predominantly negatively buoyant. In those cases where the near-field analysis results indicated that the discharge plume would stratify, surface and bottom cross sections were generated. The summer simulation proved the plume to be below mid-depth; therefore, an additional mid-depth cross section was generated.

During winter (February), at high slack tide, a distance of 680 meters (2230 feet) is required for mixing in order to meet the 2.2°C (4°F) maximum temperature limitation. This distance is well within the DRBC's 1070 meters (3500 feet) mixing zone requirement. Temperature increases above 2.2°C (4°F) at the surface during these same conditions are confined within 180 meters (600 feet) of the HCGS discharge. Under all other conditions, the thermal plume meets temperature standards at a mixing zone distance of less than 610 meters (2000 feet) (see Appendix A).

Figures 5.1-2 through 5.1-5 depict the model results that indicate that the HCGS thermal plume meets the DRBC temperature increase standard of 2.2°C (4°F) from September to May and 0.8°C (1.5°F) from June to August, or a maximum 4
of 30°C (86°F) outside the mixing zone specified in DRBC Docket D-73-193CP (Revised), April 25, 1984, under all conditions simulated.

Maximum temperature in the summer (August) at the end of a 1070 meter (3500 foot) mixing zone is 26.9°C (80.4°F), which is within the 30°C (86°F) DRBC standard.

5.1.3 EFFECTS ON AQUATIC ECOLOGY

Baseline aquatic studies have identified over 100 genera of phytoplankton, 200 invertebrate taxa and 110 species of fish as existing at least part of the year in the Delaware River in the vicinity of HCGS. A small portion of each of these populations is affected by the operation of the station's heat dissipation system, due either to the operation of the intake (impingement/entrainment effects) or the discharge (thermal effects). The cooling system is designed to reduce biotic losses by following the EPA's recommendations for minimizing cooling water system impacts, which involve the control of the design, location and capacity of the heat dissipation system (References 5.1-4 and 5.1-5). Section 3.4 provides a complete description of the heat dissipation system.

5.1.3.1 Impingement

Small fish are impinged on cooling water intakes, because of their presence within that volume of water being withdrawn, or by their attraction to or random movement into the vicinity of the intake. Once in the area of influence, these fish may swim free, by employing swim speeds in excess of the intake velocity, or remain in the area to forage. By remaining in this area to feed, the fishes' energy reserves may decrease, to the point where they may become entrapped because their swim speed can no longer overcome the intake velocity. Once a fish's swim speed is reduced below the intake velocity, the fish becomes impinged by the hydraulic forces against the traveling water screens within the intake structure. Mortality may occur due to asphyxiation (by holding the individual against the screen, thereby inhibiting proper gill movement, or holding the individual out of the water for a prolonged period of time), descaling (by screen wash water sprays or the flow of water through the screen), exhaustion (from swimming against the intake velocity) or starvation.

The key elements in the design of the HCGS intake which minimize impingement losses are:

a. Closed cycle cooling employing low water makeup requirements: approximately 2.16 cubic meters per second (76 cubic feet per second) during normal operating conditions, and 3.66 cubic meters per second (129 cubic feet per second) following normal shutdown (see Section 3.3). This reduces the number of fish susceptible to impingement.

TABLE 5.2-2

ANNUAL MAXIMUM INDIVIDUAL DOSE COMMITMENTS DUE TO GASEOUS AND LIQUID EFFLUENTS (mRem unless noted)

LOCATION	PATHWAY	RADIOIODINE AND PARTICULATES IN GASEOUS EFFLUENTS: TOTAL BODY	HIGHEST ORGAN	THYROID	
Nearest[1] farm residence milk cow and meat animal at 3.5 miles NW	Ground deposit	1.27E-3	1.49E-3 (skin)	1.27E-3	
	Inhalation (teen-total body) (child-thyroid)	4.64E-4	7.38E-2 (thyroid)	7.38E-2	
	Milk (infant)	3.64E-2	7.69E-1 (thyroid)	7.69E-1	2 E470.4
	Vegetables (child)	2.38E-2	1.17E-1 (bone)	1.16E-1	
	Meat (child)	5.41E-3	2.63E-2 (bone)	2.10E-2	
TOTALS					

LOCATION	PATHWAY	LIQUID EFFLUENTS: TOTAL BODY	BONE	LIVER	
Nearest fish at outfall	Fish ingestion	1.69E-2 (adult)	2.97E-1 (child)	2.81E-2 (teen)	1 4

NOBLE GASES IN GASEOUS EFFLUENTS

	TOTAL BODY	SKIN	GAMMA AIR DOSE (mrads)	BETA AIR (mrads)	
Nearest residence 3.5 miles NW	1.03E-1	2.79E-1	1.55E-1	1.79E-1	1 2

(1) "Nearest" refers to the location where the highest radiation dose to an individual from all applicable pathways has been estimated.

TABLE 5.2-3

APPENDIX I ANNUAL MAXIMUM INDIVIDUAL AND POPULATION DOSE COMMITMENTS(1)

	APPENDIX I DESIGN OBJECTIVES	CALCULATED DOSES	
Liquid Effluents			
Dose to total body from all pathways	3 mrem	0.0265 mrem	1 4
Dose to any organ from all pathways	10 mrem	0.383 mrem (bone)	1 4
Noble Gas Effluents (at nearest actual resident)			
Gamma dose in air	10 mrad	0.155 mrad	1 2
Beta dose in air	20 mrad	0.179 mrad	1 2
Dose to total body of an individual	5 mrem	0.103 mrem	1 2
Dose to skin of an individual	15 mrem	0.279 mrem	1 2
Radioiodines and Particulates(2)			
Dose to any organ from all pathways	15 mrem	0.981 mrem (thyroid)	1 2

	POPULATION DOSES WITHIN 80 km (50 mi)		
	TOTAL BODY	THYROID	
	Annual Dose		
Natural Radiation Background(3)	490000 man-rem		
Liquid Effluents	0.255 man-rem	0.754 man-rem	1 2
Noble Gas Effluents	15.3 man-rem	15.3 man-rem	1 2
Radioiodines and Particulates	1.04 man-rem	15.7 man-rem	1 2

(1) Appendix I Design Objectives from Sections II.A, II.B, II.C and II.D of Appendix I, 10 CFR Part 50, considers dose to maximum individual and population per reactor unit. From Federal Register, 40, p. 19442, May 5 1975.

(2) Carbon-14 and tritium have been added to this category.

(3) "Natural Radiation Exposure in the United States," U.S. Environmental Protection Agency, ORP-SID-72-1 (June, 1972); using the average terrestrial plus cosmic background (82 mrem per year for the Hope Creek area) and year 2010 projected population of 5970000.

TABLE 5.2-4

ANNUAL TOTAL-BODY U.S. POPULATION DOSE COMMITMENT

CATEGORY	U.S. POPULATION-DOSE COMMITMENT (man-Rem)
Natural background radiation[(1)] (man-rem/yr)	28,400,000
General Public	
Gas and particulates	34.6
Liquid effluents	1.58
Transportation of fuel and waste	3

1 2 4

(1) Using the average U.S. background dose (102 mrem per year) and year 2010 projected U.S. population from "Population Estimates and Projections," Series II, U.S. Dept. of Commerce, Bureau of the Census, Series P-25, No. 541, February, 1975.

CHAPTER 8

ECONOMIC AND SOCIAL EFFECTS OF STATION CONSTRUCTION AND OPERATION

TABLES

Table Number	Title	
8.1-1	HOPE CREEK OPERATION NET PRODUCTION COST SAVINGS (PENALTY)	
8.1-2	SOURCES OF REPLACEMENT ENERGY BY FUEL TYPE, AVERAGE HOPE CREEK AND REPLACEMENT PRICES, 1987-1991	
8.1-3	PROJECTED PRIMARY MARKET AREA EXPENDITURES, LOWER ALLOWAYS CREEK TOWNSHIP AND CITY OF SALEM	
8.1-	HOPE CREEK MAINTENANCE DATA	E320.2
8.1-5	PROJECTED NUMBERS OF OPERATING PHASE WORKERS AT HOPE CREEK GENERATING STATION	E310.7
8.1-6	ESTIMATED GROSS RECEIPTS, FRANCISE AND REAL ESTATE TAXES ATTRIBUTED TO HCGS	4
8.2-1	HCGS DIRECT COSTS	
8.2-2	POPULATION CHANGES IN THE PROJECT AREA	

The state distributes this tax revenue to all municipalities where equipment is located, not just within the utilities' service areas.

b. Franchise Tax - The franchise tax is a tax paid to the state for the privilege of PSE&G and Atlantic Electric exercising their franchises in the public streets. It is levied at the rate of five percent on taxable gross revenues (74 percent of total electric gross revenues). The taxable amount of gross revenues for franchise tax purposes is determined yearly by multiplying total gross revenues by the percentage that the miles of lines located on public property bear to the total miles. The state then distributes the franchise tax to various municipalities in the proportion the amount the public value of utility property in a municipality bears to the total public value in the state, within certain statutory limitations. This tax is paid primarily to municipalities within the utilites' service areas, although there are few cases where the utilities use public streets outside the service area, and in those cases franchise taxes are distributed to the municipalities involved.

c. Surtax - The surtax is equal to 12.5 percent of the total gross receipts and franchise tax paid; the surtax is paid to the state for general state use.

Based on the above, about 12.5 percent of the revenues produced by the sale of electricity from HCGS would be paid to the state government in Gross Receipts and Franchise Taxes (see Table 8.1-6). Based on an estimated average price of electricity of 11.8¢ per kilowatt-hour in 1987, these taxes for the owners would amount to about $94 million in 1987, and $163 million per year, levelized over the life of the generating station. 4

The amount of money that any one municipality can receive through these taxes is limited by various constraints, one of which is a cap equal to $700 per capita. This cap would apply to Lower Alloways Creek, since Salem Generating Station is located in that municipality; therefore, the state would not allocate most of the tax revenue to Lower Alloways Creek, but would channel it into the Municipal Assistance Fund for distribution primarily to the larger inner core cities of Newark, Jersey City, Camden, Elizabeth, Trenton and Paterson.

Real Estate Taxes

Land and buildings, as commonly understood, are subject to property tax. The Township of Lower Alloways Creek has no local or school tax levies. A property tax (one of the lowest in the state) is collected to pay Lower Alloways Creek's share of county taxes. The local tax rate for Lower Alloways Creek is estimated to be $1.23 per $100 of assessed value, in 1987. Based on this rate, a 1987 land tax of $6581 is estimated for 107 acres at $5000 per acre. Estimating an improvement assessment of $63.6 million, the corresponding tax would be $782,280. The total tax revenue for 1987 attributable to HCGS is therefore roughly $789,000. This figure was assumed to continue annually and was escalated at a GNP deflator rate of 7.0 percent to 1988 and 6.5 percent thereafter (see Table 8.1-6). Using a 30-year plant life and an 11.7 percent cost of money, the levelized lifetime property tax revenue to be expected from HCGS is calculated to be about $1.4 million per year. E310.4 4

Revenues to Lower Alloways Creek Township have increased significantly since 1970, due to construction and operation of the Salem Generating Station. These increased revenues have enabled the Township to build a new municipal building, new high school, new sewage treatment plant and new recreational facilities. Operation of HCGS will add to these revenues.

8.1.2.2 Payroll and Employment

The Applicant anticipates an operating staff of 397 persons for HCGS, with an associated payroll of $18.6 million in 1987 (in 1983 dollars). The payroll will result in federal and state income tax revenues, but no municipal income taxes are collected. Table 8.1-5 contains the projected number of operating phase workers at HCGS from 1983 through 1987. 1 4 E310.7

Approximately 95 percent of the contractor employees (security forces) projected to be onsite will come from the local (within 64.4 kilometers (40 miles) of the site) area, based on hiring experience to date. E310.6

8.1.2.3 Increase in Primary Market Area Expenditures and Generating of Secondary Employment

The Primary Market Area is defined as Lower Alloways Creek Township and the City of Salem, for these purposes. Secondary employment is that which is created in retail and service establishments because of increased demand due to new residents and employees.

The City of Salem has experienced a historical decline in its economic base since it is no longer an active port. Its increasingly isolated geographical position has resulted in out-migration of population and of retail and wholesale establishments. Since the economic base is limited, only the basic needs, e.g., food services, some clothing and supplies, can be met in Lower Alloways Creek Township and the City of Salem. Therefore, much of the disposable income generated by plant employment will be spent at urban centers outside the immediate area, especially for major purchases.

It is estimated that approximately 35 percent of income is spent on non-auto-related goods and services (Reference 8.1-1). In this instance, the capture rate for residents is about 60 to 70 percent. The capture rate for the operations workers who are not residents is estimated at 10 to 15 percent (see Table 8.1-3). The projected increase in local expenditures and services due to the operations employees is 1
approximately 6.6 percent.

Public Service Electric and Gas Company plans to purchase goods and services within and beyond the 80-kilometer (50-mile) area referred to in the question. The 50-mile radius includes the major metropolitan areas of Philadelphia, Camden, Wilmington and Baltimore. Major suppliers of industrial equipment, spare parts, etc., may be reasonably expected to exist in these areas, as are sources of craft E310.8
labor, etc., for assistance during outages. Based on 4
present PSE&G expenditures, the projected expenditures for such goods and services purchased from local businesses, for Hope Creek Generating Station in 1987, is between approximately 5 and 10 million dollars (in 1984 dollars). However, efforts are made to purchase goods and services from the lowest qualified bidder, regardless of location, unless time of delivery is a factor, in which case local sources might be given priority.

8.1.2.4 Improvement of Local Roads and Transportation Facilities

The intersection of Hancocks Bridge Road and Alloway Creek Neck Road in Hancocks Bridge has been improved, and plans are currently underway to widen Lower Alloways Creek Neck Road for a distance of approximately six kilometers (four miles).

8.1.2.5 Research, Environmental Monitoring and Environmental Education

PSE&G is currently conducting numerous environmental studies involving water chemistry, thermal data, and aquatic and terrestial biological monitoring programs. These areas will be studied throughout the operating life of HCGS. The knowledge gained from these programs will contribute to the understanding and prediction of environmental interrelationships.

TABLE 8.1-5

PROJECTED NUMBERS OF OPERATING PHASE WORKERS AT HOPE CREEK GENERATING STATION (1)

UTILITY EMPLOYEES	1983	1984	1985	1986	1987
Management (Administrative and Secretarial Workers)	13	20	21	22	22
Operation	70	92	101	102	102
Technical	80	92	97	97	97
Maintenance	67	108	129	129	129
Radiation Protection	24	33	41	47	47
Subtotal	254	345	389	397	397
CONTRACTOR EMPLOYEES					
Security	100	110	120	130	140
Total	354	455	509	527	537

E310.7

4

(1) These projected numbers do not include construction personnel.

TABLE 8.1-6

ESTIMATED GROSS RECEIPTS, FRANCHISE, AND REAL ESTATE TAXES ATTRIBUTED TO HCGS (Millions of Dollars)

YEAR	GROSS RECEIPTS AND FRANCHISE TAX (1)	REAL ESTATE TAX (1)
1987	94	0.789
1988	100	0.844
1989	97	0.899
1990	116	0.958
1991	110	1.020
1992	117	1.086

(1) Figures given in each year's dollars

4

8.2 COSTS

8.2.1 DIRECT COSTS (INTERNAL COSTS)

Direct costs associated with HCGS include variable costs, which are documented in Section 8.1.1, and fixed costs not related to production levels, but incurred as a result of HCGS operation. Table 8.2-1 documents variable and fixed costs for HCGS, presenting total lifetime costs, first year costs and levelized lifetime annual costs. A 30 year operational life is assumed. Annual variable costs are shown as mills per kilowatt-hour, and fixed costs are expressed annually as dollars per kilowatt of installed capacity. An 11.7 percent cost of money was used to determine present worth and levelized values.

Variable costs are fuel costs and those operation and maintenance costs that vary with the amount of energy produced. Total lifetime fuel cost is estimated to be $1.049 billion (1987 dollars), or $127 million per year (levelized). Variable operation and maintenance costs are estimated at $371 million (1987 dollars), or $45 million per year. Levelized costs per unit of production are 20.5 mills per kilowatt-hour for fuel and 7.3 mills per kilowatt-hour for variable O&M.

Fixed costs are independent of production levels. Table 8.2-1 describes fixed costs in dollars per kilowatt based on a generating capacity of 1067 megawatts for HCGS. Fixed operating and maintenance costs, as shown, include a number of annual costs necessary for the operation of HCGS, but not determined by level of output. These include:

a. Minimum staffing and services required to perform such activities as environmental surveillance, security, health physics, and other requirements for operating and maintaining HCGS regardless of output level. The estimated total lifetime (30 year) cost is $878 million (1987 dollars), or a levelized annual cost of $107 million.

b. Annual NRC fees for routine inspections and facility license amendments. Based on the current fee structure and estimated cost escalation rates, the total lifetime cost would be $2.3 million (1987 dollars), or a levelized annual cost of $276,000.

c. Liability, property and energy replacement insurance. Based on currently available insurance, estimated lifetime costs are $122 million (1987 dollars), or a levelized annual cost of $14.8 million.

d. Property taxes. Total lifetime cost is estimated to be $12 million, or $1.4 million per year levelized cost. This figure does not include gross receipts and franchise taxes collected in lieu of property taxes and based on total revenues.

Other fixed costs, not incurred annually, are documented separately. These include:

a. NRC operating license fee. The fee for this license is currently $1,024,500, or $1.6 million in 1987 dollars. This corresponds to a levelized annual cost of $190,000.

b. Unit decommissioning costs upon retirement. See Section 5.8 for an estimate of decommissioning costs.

8.2.2 INDIRECT COSTS (EXTERNAL COSTS)

Population Changes and Housing Demand

Population increase due to in-migration of operations workers should be minimal, especially in view of the fact that out-migration of construction workers who relocated to the project area most probably will occur at the end of the construction phase. Population has decreased within the last ten years in the City of Salem, and increased in Lower Alloways Creek Township (see Table 8.2-2).

The demand for housing in the project area (Lower Alloways Creek Township and the City of Salem) should increase minimally. Based on recent experience with the relocation of Nuclear Department Staff to Artificial Island, the 397 workers projected for Hope Creek Generating Station in 1987 should reside in the following areas: eastern Delaware (10 percent), Salem County (20 percent), Gloucester County (30 percent), Cumberland County (5 percent), Burlington County (20 percent), Camden County (10 percent), and Other (5 percent). 4

The single family residences which have been converted to multi-family apartments and boarding houses during the construction phase will provide lower income housing when the construction workers leave. This type of multi-unit housing was almost non-existent prior to construction of Salem Generating Station and HCGS.

QUESTION E291.11 (Section 13.4)

Provide a copy of the Salem Generating Station 316(b) demonstration at the time it is submitted to the NJDEP (scheduled for June 15, 1983).

RESPONSE:

A copy of the Salem Generating Station 316(b) demonstration was provided to the Nuclear Regulatory Commission on March 5, 1984. 4

QUESTION E291.22

Provide a copy of the NPDES permit renewal application when submitted to the state.

RESPONSE

A copy of the NPDES permit renewal application was provided to the Nuclear Regulatory Commission in June 1984. 4

QUESTION E310.4 (Section 8.1.2.1)

What assumptions were made in deriving the levelized lifetime estimate of local real estate taxes (Section 8.1.2.1)?

RESPONSE

The total tax revenue for 1987 attributable to HCGS is roughly $789,000. This figure was assumed to continue annually and was escalated at a GNP deflator rate of 7.0 percent to 1988 and 6.5 percent thereafter (see Table 8.1-6). Using a 30-year plant life and an 11.7 percent cost of money, the levelized lifetime property tax revenue to be expected from HCGS is calculated to be about $1.4 million per year. 4

QUESTION E310.6 (Section 8.1.2.2)

The operating staff for HCGS is estimated to be 378 persons (Section 8.1.2.2). Does this figure include security forces and other contractor employees who would regularly be employed at the HCGS site? If not, the applicant should provide data on such employment and its contribution to local payroll.

RESPONSE

The operating staff for Hope Creek Generating Station, as distinguished from construction personnel, is projected to be approximately 397 persons in 1987, not 378 as originally reported. The operating staff for HCGS is projected to be 254 persons in 1983 and 345 persons in 1984. These numbers do not include approximately 100 and 110 contractor employees, respectively, who are projected to be on site in support of operations. The payroll projections for contractor employees (in this case security guards) for the fiscal years:

6/17/83 - 6/17/84 is approximately $2,000,000
6/17/84 - 6/17/85 is approximately $2,000,000
(Projections beyond 1985 are not available.)

Since approximately 95% of the contractor employees will be local (within 64.4 Kilometers (40 miles) of the site) residents, their contribution to the local payroll is estimated to be $1,900,000 for each fiscal year. 4

QUESTION E310.8 (Section 8.1.2.3)

Does the applicant intend to purchase goods and services from suppliers in the local (within 50 miles) area? If so, the applicant should indicate the kind and amount of such purchases.

RESPONSE

Public Service Electric and Gas Company plans to purchase goods and services within and beyond the 80-kilometer (50-mile) area referred to in the question. The 50-mile radius includes the major metropolitan areas of Philadelphia, Camden, Wilmington and Baltimore. Major suppliers of industrial equipment, spare parts, etc., may be reasonably expected to exist in these areas, as are sources of craft labor, etc., for assistance during outages. However, efforts are made to purchase goods and services from the lowest qualified bidder, regardless of location, unless time of delivery is a factor, in which case local sources might be given priority. Based on present PSE&G expenditures, the projected expenditures for such goods and services, purchased from local business, for Hope Creek Generating Station in 1987 is between approximately 5 and 10 million dollars (in 1984 dollars). 4

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F 2.1-26	0
F 2.1-27	1
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2.2-4	1
2.2-5	1
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2.2-6(a)	1
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T 2.2-4	1
F 2.2-1	0
F 2.2-2	0
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F 2.4-7	0
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2.5-3	0
2.5-4	1
2.5-5	1
2.5-6	1
2.5-7	1
2.5-8	0
2.5-9	0
2.5-10	0
2.5-11	0
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3.1-1	0
3.1-2	4
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T 3.1-1	[illegible]
F 3.1-1	0
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F 3.1-4	3
3.2-1	1
3.2-2	0
T 3.2-1	0
F 3.2-1	0
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3.3-2	0
3.3-3	0
T 3.3-1	2
F 3.3-1	4
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Refs.	
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T 3.4-1	1
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T 3.4-2	0
T 3.4-3	0
T 3.4-4	0
T 3.4-5	4
T 3.4-6	1
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F 3.4-6	0
F 3.4-7	1
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T 3.5-1	
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T 3.5-2	0
T 3.5-3	0
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T 3.5-28	0
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F 3.5-2	0
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F 3.5-9A	0
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F 3.7-1	0
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T 3.8-1	0
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F 3.9-3B	1
F 3.9-3C	1
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F 5.1-16	0
F 5.1-17	0
F 5.1-18	1
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T 5.2-1	0
T 5.2-2	4
T 5.2-3	4
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8.1-6	1
Refs.	
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T 8.1-1	0
T 8.1-2	0
T 8.1-3	1
T 8.1-4	1
T 8.1-5	4
T 8.1-6	4
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8.2-2	4
8.2-3	0
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QUESTIONS

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F E291.21-2	2
E291.22-1	4
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E310.2-1	1
E310.3-1	1
E310.4-1	4
E310.5-1	1
E310.6-1	4
E310.7-1	1
E310.8-1	4
E310.9-1	1
E311.1-1	1
E311.2-1	1
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