LIMERICK GENERATING STATION UNITS 1 & 2

ENVIRONMENTAL REPORT - OPERATING LICENSE STAGE

REVISION 15 PAGE CHANGES

The attached pages, tables, and figures are considered part of a controlled copy of the Limerick Generating Station EROL. This material should be incorporated into the EROL by following the instructions below.

After the revised pages are inserted, place the page that follows these instructions in the front of Volume 1.

REMOVE	INSERT
VOLUME 1	
Pages 2-i, -ii, -iv	Pages 2-i, -ii, -iv
VOLUME 2	
Pages 2-i, -ii, -iv	Pages 2-i, -ii, -iv
Figure 2.4-7d	Figure 2.4-7d
Pages 3-i, -ii, -iii	Pages 3-i, -ii, -iii
Pages 3.3-1 & -2	Pages 3.3-1 & -2
Table 3.5-1 (pgs 3 & 4)	Table 3.5-1 (pgs 3 & 4)
VOLUME 3	
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VOLUME 5	
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THIS EROL SET HAS BEEN UPDATED TO INCLUDE REVISIONS THROUGH 15 DATED 08/83.

CHAPTER 2

THE SITE AND ENVIRONMENTAL INTERFACES

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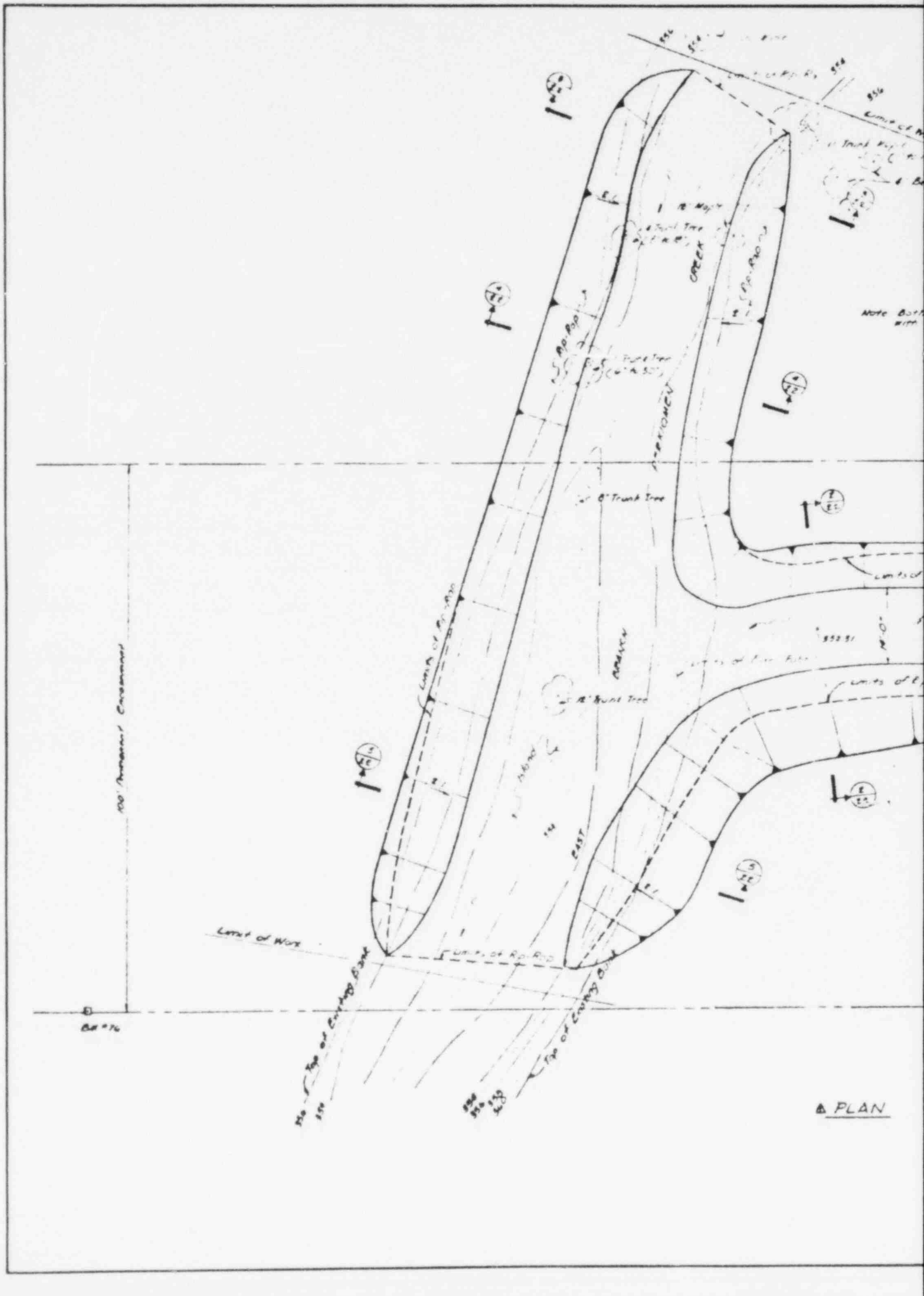
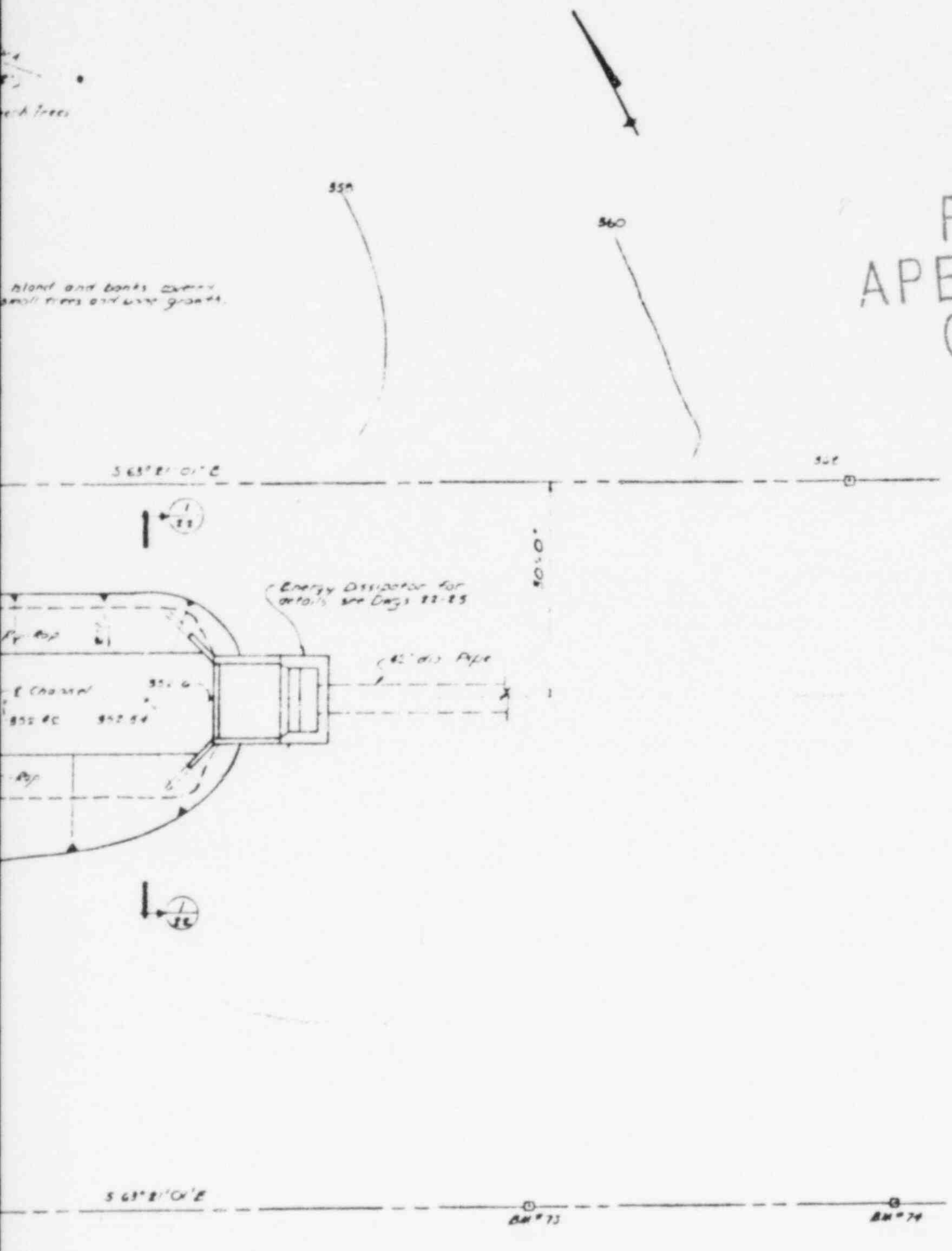


Limit of Work
Limits of Rip-Rap
Top of Existing Bank
Top of Existing Bank
8" Trunk Tree
12" Trunk Tree
Rip-Rap
PERKIOMEN
CREEK
EAST
BRANCH
Note Both

PLAN



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UNITS 1 AND 2
ENVIRONMENTAL REPORT

ENERGY DISSIPATOR CHANNEL
PERKIOMEN WATER TRANSMISSION MAIN
EAST BRANCH OF PERKIOMEN CREEK

FIGURE 2.4-7d REV. 15,08/83

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CHAPTER 3

THE STATION

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3.3 STATION WATER USE

The Limerick Generating Station uses recirculated cooling water systems with natural draft hyperbolic cooling towers for the rejection of heat contained in the turbine exhaust steam and auxiliary cooling systems. These cooling systems are used for normal operation and consist of the circulating water system and the service water system. The two systems consist of separate loops using separate pumping facilities, but the two flows are mixed together in the cooling tower. The circulating water system delivers the heated water from the main condenser to the cooling tower where heat removed from the turbine exhaust steam is rejected to the atmosphere. The service water system supplies the water for station auxiliary cooling needs required during normal operation, such as the various enclosure coolers, chilling equipment, lubricating oil coolers, fuel pool coolers, and other equipment.

During shutdowns, loss of offsite power, or loss of coolant accident (LOCA), the residual heat removal (RHR) service water system provides cooling water for the RHR heat exchangers to remove residual decay heat generated in the reactors. The emergency service water (ESW) system provides cooling water for various station equipment and area coolers and the diesel-generators in the event of loss of offsite power, or LOCA. The ESW and RHR service water systems are recirculated cooling water systems using vertical wet pit pumps located in the spray pond pump structure. These pumps provide the motive force to circulate cooling water between the various heat exchangers and either the cooling towers or the spray pond. Normally the heat will be rejected to atmosphere by way of the cooling towers. However, should the cooling towers be unavailable the spray pond will be used. In this event, cooling water would be withdrawn from, and returned to, the spray pond.

The cooling process in a hyperbolic cooling tower results in evaporation of a portion of the water being circulated. A carryover of water droplets into the air stream (drift) also occurs, and a small portion of the circulating water must be continuously discharged (blowdown) to prevent buildup of dissolved and suspended solids in the cooling water. The sum of these factors (evaporation, drift, and blowdown) is the amount of makeup water which must be supplied to the cooling towers. The concentration factor of the cooling tower is the makeup rate divided by the blowdown rate. The makeup rate is controlled to provide a constant concentration factor of about 3.4. The cooling tower blowdown rate for two units is expected to average 14 million gallons per day (MGD) and reach a maximum of 17 MGD.

The spray pond has a surface area of 9.9 acres. The spray pond is lined with 12 inches of soil and bentonite. If the spray pond were not lined, makeup for solar evaporation (35 inches per year) and seepage would be no more than 100,000 gpd during normal station operation. Since the pond is lined, this value is conservative. When the pond is in use, losses due to natural evaporation, plant heat load evaporation, seepage, drift loss, and fuel pool makeup are expected to total 20.56 MG over a 30-day period. Spray pond makeup water is normally supplied through a 6-inch branch line from the Schuylkill river makeup system, but water from either cooling tower basin could be added to the spray pond through normally closed 36-inch lines if necessary.

Rainfall and runoff into the spray pond is normally excess water that overflows a weir at El. 251 feet MSL. The spray pond overflow averages about 50,000 gpd based on a yearly rainfall cycle. Spray pond overflow from the once-a-year, 24-hour rainfall event is about 1 MGD. The spray pond overflow is routed through an 8-inch pipe to the cooling tower blowdown line and eventually discharges to the Schuylkill River through the same diffuser that is used for cooling tower blowdown. The spray pond also has an emergency spillway (formed at El. 252 feet MSL by a dip in the paved perimeter road on the north edge of the spray pond) that would spill only during intense precipitation exceeding the once-in-100-years storm. The maximum expected outflow during the probable maximum precipitation is less than 200 cfs. This spillway drains across existing terrain northward to Sanatoga Creek.

The Delaware River Basin Commission (DRBC) has exclusive jurisdiction over the necessity for and approval of compensating water storage capacity for the Limerick Generating Station. An application for such capacity has been submitted at the request of the DRBC and is now under consideration by the DRBC. With regard to the water supply aspects of the facility, the station will be operated under the terms and conditions imposed by the DRBC whether or not compensating water storage capacity is required.

Monthly average water use during two-unit, full-power operation is given in Table 3.3-1. Annual consumptive water usage rates distribution by source are 50% Schuylkill, 4% Perkiomen, and 46% Delaware. In addition to cooling tower blowdown, nonconsumptive water use includes water treated for process water makeup and subsequent waste discharge which is expected to average 100,000 gpd and reach a maximum of 300,000 gpd. A water-use schematic is shown in Figure 3.3-1 which includes the various station water systems that are described further in Sections 3.4 through 3.7.

TABLE 3.5-1 (Cont'd) (Page 3 of 4)

PARAMETER	VALUE
treatment of regenerants, and fractions of regenerant discharged (include parameters used in making these determinations)	the solid radwaste system
g. Liquid source term by radionuclide in Ci/yr for normal operation, including anticipated operational occurrences	Table 3.5-3
2. Piping and instrumentation diagrams (P&IDs) and process flow diagrams for the liquid radwaste systems along with all other systems influencing the source term calculations	Figure 3.5-1 See FSAR Chapter 11 for P&IDs
VI. Main Condenser and Turbine Gland Seal Air Removal Systems	
1. Holdup time for offgas prior to offgas treatment system (hr)	0.105
2. Description of offgas treatment system	Section 3.5.3
3. Offgas treatment system	
1) Mass of charcoal (lb)	321,790
2) Operating/dew point (°F)	60-65/40
3) Dynamic adsorption coeff. Xe, Kr (cm^3/g)	733, 31.8
4. Gland seal steam flow (lb/hr) and source	15,000 (normal) steam from condensate
5. Radioactive iodine reduction systems for the gland seal system	N/A - Clean steam from condensate is used
6. P&IDs and process flow drawings for offgas system	FSAR Figures 11.3-3 through 11.4-2
VII. Ventilation and Exhaust Systems	
1. Provisions incorporated to reduce radioactivity releases through the ventilation or exhaust systems	Reactor, turbine, and radwaste enclosure ventilation systems contain

TABLE 3.5-1 (Cont'd) (Page 4 of 4)

PARAMETER	VALUE
	charcoal and HEPA filtration systems on exhaust that are considered to be radioactive
2. Decontamination factors assumed and the bases (include charcoal absorbers, HEPA filters, mechanical devices)	
Iodine release fraction	0.1
Particulate release fraction	0.01
3. Release rates for radioiodines, noble gases, and radioactive particulates (Ci/yr)	Table 3.5-6
4. Release point to the environment:	3 roof vents
Height above plant grade	200 feet
Effluent temperature rise	20 to 50°F above ambient
Exit velocity	Approx. 10 m/sec
5. Containment purge and venting frequency (per year)	5
VIII. Solid Waste Processing Systems	
1. Solid waste processing system inputs:	
a. Source, volume (ft^3/yr per reactor)	Table 3.5-11
b. Activity (Ci/yr per reactor) of principal radionuclides	Table 3.5-12
2. Onsite storage provisions (location and capacity) and expected onsite storage times for all solid wastes prior to shipment	Section 3.5.4
3. P&IDs and process flow diagrams for the solid radwaste system	Figure 3.5-3 See FSAR Chapter 11 for P&IDs (Ref 3.5-2)

CHAPTER 4

ENVIRONMENTAL EFFECTS OF SITE PREPARATION, STATION CONSTRUCTION AND TRANSMISSION FACILITY CONSTRUCTION

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TOTAL FUEL AND INTERCHANGE $ x 10^6

Year	Forecast Load Growth		Zero Load Growth	
	With Limerick	Without Limerick	With Limerick	Without Limerick
1985	516.3	659.5	468.9	605.0
1986	498.2	687.0	441.5	618.9
1987	526.1	775.2	452.8	683.2
1988	510.9	889.8	421.7	765.3
1989	461.0	977.3	365.8	819.9
1990	527.5	1070.6	409.4	880.8
1991	620.0	1250.7	461.4	1011.1
1992	592.2	1280.5	425.9	1017.5
1993	700.1	1436.6	497.0	1122.4