United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 83/803

AUG 26 1983

U.S. Nuclear Regulatory Commission
Attention: Director, Division of Licensing
Washington, D.C. 20555

Dear Sir:

The Department of the Interior has reviewed the draft environmental impact statement for the Limerick Generating Station, Units 1 and 2 (OLS), Montgomery County, Pennsylvania and has the following comments.

Surface Water Hydrology

Section 43.1.1.3 notes that upstream reservoirs can maintain a flow of 3,000 cfs at Trenton during a moderate drought. This is incorrect. Records show that the existing reservoirs could not even maintain 2,500 cfs flow at Trenton during a drought one fourth as severe as the 1960's drought. In fact, historical flow records show that flows have dropped below 2,500 cfs at Trenton in every month except March, April and May even with 90 percent of the existing upstream storage in operation. With all the storage listed on page 4-21 in operation, flows at Trenton dropped below 2,500 cfs during four months in 1977, one month in 1980, and three months in 1981. In January 1981, the flow in the river was only 1,900 cfs at Trenton. The Delaware River Basin Commission (DRBC) now admits that by the year 2000, they may not be able to maintain a 2,300 cfs flow at Trenton because of increased consumptive losses in the basin. For example, the 1980 Delaware River Level B Study reported consumptive withdrawals of 1,495 cfs in 1980 with projections of 2,503 cfs by the year 2000. Furthermore, by virtue of a 1954 Supreme Court decree, New York City and New Jersey can remove up to 1,395 cfs from the basin. The Level B Study also reports that over 125 water purveyors are expected to have deficiencies in allocation, storage and yield by the year 2020. The DRBC recognizes that several more large reservoirs must be constructed in the basin to achieve the minimum flow objectives at Trenton.

We recommend that the paragraph be revised to reflect the severity of the low flow problems in the Delaware River and the inability of present practices to adequately deal with the problem.

It is unclear whether the 27 cfs pumping rate to be maintained throughout the low flow season is for water withdrawn from the Delaware River or from Bradshaw Reservoir. The applicant would be required to maintain a discharge of 10 cfs into the East Branch of Perkiomen Creek, not 10 cfs in Perkiomen Creek. The minimum flow of record in Perkiomen Creek is 4.7 cfs and the Q7-10 flow is 17.7 cfs. The final statement should clearly indicate what requirements will be placed on the applicant to maintain flows in the Perkiomen Creek Basin.

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A 10 percent loss of water in transport from the Delaware River to the Limerick Generating Station has been estimated. This may be very conservative considering the evaporative losses in Bradshaw Reservoir and over 23 miles of Perkiomen Creek, leakage from transmission pipes and Bradshaw Reservoir, channel storage, and groundwater intrusion.

All of Montgomery County and parts of Bucks, Lehigh, Berks and Chester Counties were declared a "groundwater protected area" by the DRBC on October 8, 1980, because of over-withdrawal from groundwater. Approximately 220 miles of streams are directly impacted by induced groundwater intrusion and another 182 miles adversely affected by reduced flows. Studies by Chester-Betz Engineers and Moody Associates identified at least one mile of the East Branch of Perkiomen Creek downstream from the discharge point as a groundwater intrusion area. The studies also revealed that water discharged from Greenlane Reservoir on Perkiomen Creek is lost to groundwater before it reaches the Philadelphia Water Company's pump-out point near the mouth of Perkiomen Creek. Water will be conveyed in Perkiomen Creek during dry weather at the same time over-pumping of groundwater will be most severe. We believe that losses in transit may be far greater than previously estimated. We recommend that transit loss estimates include potential losses from groundwater intrusion and evaporation as well as transmission pipe leakage.

Aquatic Resources

Collection of eggs and larval American shad, alewife, and blueback herring in 1982 confirms that the area in the vicinity of the Point Pleasant intakes is also used for spawning by alosids. As the alosid population in the river increases, we expect this area to be used more heavily for spawning in the future. The text should be revised to reflect the most recent information.

Water Use and Treatment

The data presented in this section does not clearly explain what the actual consumptive water loss will be at the power plant. Table 4.1 shows the maximum use of Delaware River water to be 57.4 cfs and a maximum evaporation loss of 56.6 cfs. Since the maximum water withdrawal from the Delaware River at Point Pleasant will be 71 cfs and 65 cfs on Perkiomen Creek as noted on page 4-10, it appears there will be a 13.6 cfs loss of water in transit to the plant. If so, the statement should be revised to more clearly discuss how much water will be lost.

Table 4.1 shows water will not be withdrawn from the Delaware River from November through May. Once water is withdrawn from the Delaware River, the applicant will be required to maintain a pumping rate of 27 cfs during the normal low flow season and 10 cfs flow in Perkiomen Creek for the remainder of the year. Flows have dropped below 530 cfs (which requires the applicant to use the Delaware River) in nearly every month of the year at the Pottstown gage on the Schuylkill River upstream of the Limerick Generating Station. Therefore, some pumping from the Delaware River may be required year-round to meet the DRBC flow requirements. We recommend this section clearly

state the range of consumptive water loss and indicate the potential for year-round pumping from the Delaware River.

Water Quality

Although Delaware River water quality has been described as very good, there is evidence of pollution by at least two metals. The data used by the DRBC and subsequently by the Pennsylvania Department of Environmental Resources were from monthly grab samples and some 24 hour composite samples. Monthly grab samples are inadequate to accurately represent the quality of flowing water. Only continuous monitoring could achieve the accuracy implied by the text. Whole fish flesh analysis of fishes taken from the Delaware River at the I-95 bridge 18 miles south of Point Pleasant and at Upper Black Eddy 15 miles north of Point Pleasant indicate high levels of cadmium and lead. The level in these Delaware River fish fall in the upper 15 percent of all samples collected nationwide as part of the National Pesticide Monitoring Program. As noted on page 4-29, state standards for cadmium have been violated in the Delaware River.

Sampling data by the Merrill Creek Owners Group 25 miles upstream of the proposed project shows peaks of 0.9 mg/l total phosphorous and 0.75 mg/l orthophosphate after storms. (It is noted on the bottom of page 4-26 that phosphorous limits are violated at the Point Pleasant intake site.) Even with a three day turnover rate in Bradshaw Reservoir, such high levels of phosphorous could cause agal blooms in the reservoir. With lower pumping rates, detention time would increase and the potential for agal blooms would be even higher. Heavy agal blooms could degrade water quality and cause anoxic conditions. This poorer quality water would than be withdrawn from the reservoir and discharged to Perkiomen Creek.

Water intakes on the Delaware River are only 800 feet downstream from Tohickon Creek. Route 32 crosses Tohickon Creek approximately 200 feet upstream of its confluence with the Delaware River. A chemical spill accident at the Route 32 bridge would quickly travel downstream and be drawn into the Point Pleasant intake, and eventually contaminate Bradshaw Reservoir. Depending on the nature of the chemicals involved, pollutants could eventually find their way to Perkiomen Creek.

Environmental Consequences

To calculate the highest possible percentage of the flows that would be withdrawn by Limerick, a flow of at least 3,000 cfs is assumed to be maintained at Trenton. We are not sure why the 3,000 cfs value is used since even a cursory examination of USGS gaging records show that flows of less than 3,000 cfs are not an uncommon occurrence. In fact, the low flow at the Trenton gage was 1,180 cfs (October 1962). As recently as January 1981, the flows at Trenton dropped to 1,900 cfs. At a flow of 1,180 cfs, the Point Pleasant project would withdraw 12.3 percent of the river water. Since it is the extreme fluctuations that most significantly impact fish and wildlife resources, it is misleading not to evaluate the extremes as part of the impact assessment. The text should be changed accordingly.

The statement that Limerick will not be permitted to withdraw water when flows at Trenton fall below 3,000 cfs is unrealistic. Flows at Trenton have fallen below 3,000 cfs numerous instances since U.S. Geological Survey (USGS) began keeping records. Yet we are unaware of a single instance when DRBC has required anyone to stop withdrawing water because of low flows at Trenton. We recommend this sentence be deleted and this section be revised to reflect customary practice.

Cumulative impacts from water withdrawals in the basin have been ignored. The final statement should discuss the combined effects of: over-allocating water in the basin; diverting a maximum of 1,395 cfs to New York City/New Jersey; over-pumping groundwater; excessive consumptive withdrawals; and the lack of adequate make-up water storage in the basin on salinity intrusion in upper Delaware Bay. Model runs of the Thatcher/Harleman salinity model for Delaware Bay have never taken the reduced flows from over-pumping groundwater into account in their consumptive use estimates. The large Raritan-Magothy-Potomac Aquifer passes under the Delaware River south of Camden, New Jersey and is currently being pumped at three times its recharge rate near Camden. According to the USGS, lower water tables have actually caused water from the Delaware River to flow into the groundwater.

Also, the DRBC salinity model assumes a minimum flow of 2,700 cfs yet the average monthly flow for January 1981, was 2,539 cfs (minimum daily of 1,900 cfs) during a drought only one-fourth as severe as the 1960's drought. Adequate storage does not now exist in the basin to maintain target flows at Trenton.

The progressive decrease in freshwater input and rising sea level has resulted in higher salinity levels in Delaware Bay. A study by Dr. Harold H. Haskin (1972) showed significant increases in salinity at five locations in Delaware Bay over a 41-year period. Model runs by the Thatcher/Harleman Salinity Model predicted greater than 15 ppt isohaline levels over the seed oyster beds in the estuary year-round during dry years (the model run assumed only a 1,000 cfs consumptive use and 2,700 cfs river flow at Trenton). Seed oyster beds are an important part of a multi-million dollar industry in Delaware Bay. Salinity levels above 15 ppt isohaline allow the seed oysters to be attacked and destroyed by the oyster drill and the protozoan MSX. The DRBC study on the effects of rising sea level on salinity identified the need for 3-10 cfs/year more freshwater input to maintain existing salinity regimes in Delaware Bay.

A similar argument for the cumulative effects of water withdrawals can be seen with dissolved oxygen in the estuary. The DRBC dissolved oxygen model shows a direct relationship between river flows and dissolved oxygen in Zone II of the Delaware estuary. Water withdrawn at Point Pleasant will bypass all but three miles of Zone II. Even slight changes in flow of 200-300 cfs can cause more than a 1 mg/l change in dissolved oxygen in Zone II. Diadromous fishes must pass through Zone II of the estuary to reach spawning and nursery areas in the Delaware River. Therefore, it is crucial to the continued existence of these runs to have adequate levels of dissolved oxygen for passage in the spring and fall. Low dissolved oxygen levels are suspected of causing poor repeat spawning by adult American shad and large die-offs of juvenile American shad in the Delaware River estuary. The final statement should assess this issue.

We disagree that there will not be water quality problems in the East Branch of Perkiomen Creek. Weekly samples at the proposed Merrill Creek Reservoir intake 25 miles upstream on the Delaware River had a range of orthophosphate between 0.01 to 0.75 mg/l. With a short detention time in Bradshaw Reservoir, up to four times the level of organic phosphates could be discharged to the East Branch stimulating nuisance agal blooms and plant growth downstream.

Aquatic Resource Impact Summary

Because the Delaware River also has withdrawal restrictions for the Point Pleasant project, make-up water storage capacity on the Delaware River is necessary. When the proposed project was originally planned, DRBC assumed that existing storage capacity was available. However, recent droughts have demonstrated that existing storage cannot even meet the current water demands. Therefore, the applicant has entered into an agreement to help build the Merrill Creek Project. The Merrill Creek Project will inundate 712 acres of high quality wildlife habitat including 1.7 miles of a native brook trout stream. The brook trout is a State-designated threatened species. Habitat for the State-designated threatened longtail salamander and the State-designated endangered cooper's hawk will also be lost. Despite the fact that Merrill Creek is necessary for operating the Limerick Generating Station under all flow conditions, there is very little discussion in the statement about the Merrill Creek project and nothing about the habitat losses and disturbance from operation of this project. We recommend the draft statement be revised to discuss impacts from the Merrill Creek Project and that less environmentally damaging make-up water storage options in the Schuylkill River Basin be seriously considered.

Unavoidable Adverse Impacts

The draft statement (OLS) does not adequately address impacts to fish and wildlife resources nor does it reflect the most recent information pertaining to fish and wildlife resources impacted by the project. The impact assessment in this statement for the Point Pleasant Diversion relies heavily on data previously prepared by the Delaware River Basin Commission (DRBC). We believe the assumptions used by DRBC in the original models to generate this data are no longer valid, based on the most recent information available.

We do not agree that project operations will have no adverse impacts to fish and wildlife resources. The potential exists for cumulative adverse impacts to water quality in the Delaware estuary and to increased salinity intrusion in upper Delaware Bay. Water quality may be degraded in Perkiomen Creek during diversions from the Delaware River. The potential also exists for entrainment and impingement of eggs and larval fishes by the Point Pleasant intakes.

The potential for impacts on ground-water resources as a result of a Class 9 accident involving penetration of the basemat by reactor core debris is especially worthy of analysis at the Limerick site. This is true because the Brunswick aquifer is characterized

by secondary permeability derived largely from vertical joints as noted on page 4-22. The existence of such permeability may permit relatively rapid movement of contaminants in ground water in the event of a melt through of the basemat and resulting escape of contaminants from the containment.

Fish and Wildlife Coordination Act

These comments do not preclude separate evaluation and comments by the Fish and Wildlife Service (FWS) pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), since the proposal to construct the dam and water intake structures will require Section 404 permits from the Corps of Engineers.

POINT PLEASANT

On October 18, 1982, the FWS recommended denial of the Department of the Army permit (Public Notice No. NAPOP-8-0534-3, dated April 6, 1981) to the Neshaminy Water Resource Authority. The reasons for the recommendation of denial were:

1. Cumulative effect of water withdrawals on salinity intrusion in Delaware Bay.

No studies have assessed the combined effects of over-allocation of water in the basin, maximum New York City/New Jersey diversion of 1,340 cfs, over-pumping of ground water, total consumptive withdrawals within the basin and lack of adequate make-up water storage in the basin on saltwater intrusion in upper Delaware Bay. Studies have documented increased salinity levels in Delaware Bay and the adverse impacts of reduced freshwater inflows on seed oyster production. The model runs of the Thatcher/Harleman salinity model for Delaware Bay have never taken into account their consumptive use figures the reductions in surface flow from over-pumping ground water (induced groundwater intrusion). The model runs have also assumed adequate storage upstream to maintain a minimum flow at Trenton, New Jersey of 2,700 cfs. Flows at Trenton, New Jersey in January 1981 dropped to 1,900 cfs and the average for the month was only 2,539 cfs.

2. Cumulative effect of consumptive water withdrawal on dissolved oxygen.

All the water withdrawn at Point Pleasant will bypass 41 miles of the Delaware River including all but 3 miles of Zone II of the Delaware River estuary. Water returning to the river via Wissahickon Creek will bypass 70 miles of the Delaware River and all of Zones II and III of the estuary. Since 1965, flows low enough to cause severe dissolved oxygen sags in the estuary have occurred in every month. Low dissolved oxygen has been blamed for poor repeat spawning by adult American shad and large die-offs of juvenile American shad in the Delaware River estuary.

3. Impacts to the North Branch Neshaminy Creek and East Branch Perkiomen Creek.

Increased discharges to both creeks will scour stream banks and stream bottom, increasing turbidity and sedimentation downstream. Increased phosphate loading of Lake

Galena will accelerate eutrophication and cause water quality problems. Whole fish flesh analysis of fish taken from the Delaware River at the I-95 bridge (18 miles south of Point Pleasant) and Upper Black Eddy (15 miles north of Point Pleasant) indicate high levels of cadmium and lead. The levels in these Delaware River fish fall in the upper 15 percent of all samples collected nationwide as part of the National Pesticide Monitoring Program. Delaware River water will degrade water quality in both streams by introducing higher levels of cadmium and lead. Several groundwater intrusion areas have been identified in Perkiomen Creek due to over-pumping of ground water. Surface water from the Delaware River will be lost to ground water when discharged into Perkiomen Creek and could potentially contaminate groundwater supplies.

4. Impacts to fish and wildlife resources in the Delaware River at the intake site.

The pipeline to the pumphouse will disturb one acre of riverine, forested wetland and permanently destroy 0.3 acre. The intake is at the edge of a large back eddy formed below Tohickon Creek. The eddy is a spawning and nursery area for American shad, river herring, channel catfish, smallmouth bass, redbreast sunfish, bluegills and black crappie. At low flows the intake will be in the back eddy and will entrain or impinge eggs and larval fish.

5. Impacts from the Merrill Creek Reservoir.

The Point Pleasant Diversion was part of the justification for building the Merrill Creek Reservoir. The Merrill Creek project would inundate 1.7 miles of brook trout stream, flood 712 acres of valuable wildlife habitat and destroy habitat for three State-designated endangered species. There are reservoir sites on the Schuylkill River that would be less environmentally damaging and eliminate the need for the Point Pleasant Diversion.

MERRILL CREEK

In reviewing applications for permits, the FWS recommended denial for the following reasons:

1. Loss of 712 acres of valuable wildlife habitat, including habitat for State-designated threatened species (the longtail salamander and brook trout), and State-designated endangered Cooper's hawk.

2. Loss of 1.7 miles of native brook trout stream.

3. No mitigation plan to compensate for loss of fish and wildlife habitat.

4. The least environmentally damaging alternative was not selected.

5. Inadequate minimum releases from the reservoir into Merrill Creek to protect brook trout habitat downstream.

6. Impacts from the proposed intake structure on the Delaware River.

7. Entrainment and impingement problems at the intake on the Delaware River, especially American shad.

8. Withdrawal of water during low river flows will result in cumulative adverse impacts downstream.

We hope these comments will be helpful to you in the preparation of a final statement.

Sincerely,

Terence N. Martin

for Bruce Blanchard, Director
Environmental Project Review