Mr. Robert J. Sugarman, Esq.
Sugarman, Denworth and Hellegers
16th Floor, Center Plaza
101 North Broad Street
Philadelphia, Pennsylvania 19107

50-352
50-353

Dear Mr. Sugarman:

I am in receipt of your letter to me of July 13, 1984. In the letter, you requested that it and an earlier letter to me dated May 23, 1984, be treated as a new petition submitted under 10 CFR 2.206 of the Commission's regulations by you on behalf of Del-Aware.

Your two letters essentially reiterate an earlier request by Del-Aware in the December 16, 1983, "Application of Del-Aware Unlimited et al. Under Section 2.206" that the Nuclear Regulatory Commission require Philadelphia Electric Company (PECo) to secure an alternative source of supplemental cooling water for the Limerick facility. That request was based on certain actions taken by local entities concerning the Point Pleasant Diversion Project, the currently proposed source of supplemental cooling water for the Limerick facility.

In my "Director's Decision under 10 CFR 2.206" of April 25, 1984, dealing with this issue 1/, I determined that action on the part of the Commission would be appropriate to review alternatives to the currently proposed supplemental cooling water system if the current proposal should for some reason fail and if PECo should then identify an alternative proposal to supply supplemental cooling water for the Limerick facility. I noted that any alternative would then have to be reviewed in the same fashion as the original proposal was examined by the Agency prior to the issuance of the construction permit for the Limerick facility. In my Decision, I further noted that PECo's actions appear clearly directed at insuring completion of the presently proposed supplemental cooling water system and that concerns that the project may not be complete and consequently that alternative sources of cooling water may be required for the Limerick facility were premature and speculative. On this basis, I declined to commit the Agency's resources to examine such concerns.

Your letter of May 23, 1984 to me simply reiterated the earlier request of Del-Aware. There was nothing in that letter which would cause me to reconsider the matter and I so informed you in my letter of June 29, 1984.

Your most recent letter again asks that the Commission question PECo's current proposal for supplemental cooling water for the Limerick facility and address the potential for alternatives. Your letter notes certain actions taken by the Pennsylvania Environmental Hearing Board and the Pennsylvania Public Utilities Commission as supporting your request.

1/ Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), DD-84-13, April 25, 1984.

The basic licensing function of the Commission is to review project proposals submitted by an applicant. I have noted this in earlier correspondence. In this matter, the Point Pleasant Diversion Project was submitted for review by PECo at both the construction permit and operating license stage of the proceeding. To the extent a submitted proposal is no longer viable, an applicant may submit an alternative for the Commission's consideration. In this context, the actions you request are inappropriate.

It should be noted that none of the actions identified in your letter of July 13, 1984, constitute a bar to the Point Pleasant Division Project. The concerns raised by your letter are again premature and speculative thereby confirming my earlier view that any consideration of your request is not an appropriate use of Agency resources.

In sum, your letter presents no new information which would cause me to reconsider my earlier decisions on this matter. As I have already fully considered this question in my earlier Director's Decision pursuant to 10 CFR 2.206 and in my letter to you on June 29, 1984, I see no need to issue another Director's Decision with regard to this matter.

Sincerely,

Original Signed By
H. R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

w/comments noted

*EHEB	*MCEI/AD	*DE/DIR	*DL:LB#2/PM	*DL:LB#2/BC
RBallard	WJohnston	RVollmer	RMartin:bdm	ASchwencer
8/20/84	8/22/84	8/25/84	8/15/84	8/27/84
*DL:AD/L	DL:DIR	*OELD	NRR:DIR	
TMNovak	DEisenhut	BVogler	HRDenton	
9/4/84	8/ /84	&JLieberman	8/ /84	
		8/28/84		

*See previous concurrence

9/7

SEP 10 1984

DISTRIBUTION: (GREEN TICKET #14652)

Docket File (50-352/353)
NRC/PDR*
Local PDR*
EDO Control No. 14652
EDO Reading File
WDircks
ECase/HDenton
RMartin
EHylton
LB#2 Reading File/ASchwencer
MJambor/DGEisenhut
BVogler, OELD
PO'Brien/TMNovak
RBallard
WJohnston
RVollmer
KBowman, P-428, (#14652)
TMurley, PPAS
JLieberman, OELD

*w/incoming

COMMONWEALTH OF PENNSYLVANIA

BEFORE THE

ENVIRONMENTAL HEARING BOARD

DEL-AWARE UNLIMITED, INC., et al.	:	E.H.B. DOCKET NOS. 82-177-H 82-219-H
	:	
v.	:	
	:	Dam Safety and Encroachments Act,
COMMONWEALTH OF PENNSYLVANIA,	:	32 P.S. §§693.1 *et seq.*
DEPARTMENT OF ENVIRONMENTAL RESOURCES	:	Clean Streams Law, 35 P.S.
and NESHAMINY WATER RESOURCES	:	§§691.1 *et seq.*
AUTHORITY and PHILADELPHIA ELECTRIC	:	NPDES Permits
COMPANY	:	

ADJUDICATION

By the Board, June 18, 1984

This adjudication was drafted by Dennis Jay Harnish, Esquire, former Chairman of the Board, who heard this matter. The adjudication has been reviewed and approved with some modifications by Edward Gerjuoy, Esquire, one of the two remaining members of the Board. The other member, Anthony J. Mazullo, Jr. has recused himself at the request of the appellants. Prior to preparation of this adjudication, all the parties have agreed that — under the circumstances — approval by Edward Gerjuoy alone satisfies the requirements of 25 Pa. Code §21.86 concerning final decisions.

I. PROCEDURAL STATEMENT

This adjudication concerns various permit applications filed with the Pennsylvania Department of Environmental Resources (DER or Department) by the Philadelphia Electric Company (PECO) and Neshaminy Water Resources Authority (NWRA) (collectively "Applicants") for the Point Pleasant diversion project, by which NWRA proposes to provide water supplies for Montgomery and Bucks Counties and PECO proposes to obtain supplemental cooling water for the Limerick Generating Station (Limerick), a nuclear power facility located in Pottstown, Pennsylvania.

Under their agreement *inter se* NWRA will operate the Point Pleasant Pumping Station, which will transmit water pumped from the Delaware River through a jointly utilized transmission main to the Bradshaw Reservoir. From there, NWRA will divert water via the North Branch Neshaminy Creek to the North Branch Waste Treatment Plant at Chalfont. PECO will take water from the Bradshaw Reservoir by pipeline to the East Branch Perkiomen Creek, and on to the Limerick facility via the East Branch and main stem of the Perkiomen.

On April 7, 1981, December 18, 1981 and January 7, 1982, respectively, PECO filed applications with the Department pursuant to the Dam Safety and Encroachments Act, 32 P.S. §§693.1 *et seq.*, Flood Plain Management Act, 32 P.S. §§679.101 *et seq.* and The Clean Streams Law, 35 P.S. §§691.1 *et seq.* for three permits facilitating the diversion of this water to the Limerick facility (PECO Exhibits 8, 9 and 10). Accordingly, on September 2, 1982, the Department issued PECO Permit No. ENC 09-51, permitting construction and maintenance of a water supply pipeline under the bed and across the channel of various streams in Plumstead and Bedminster Townships, Bucks County (PECO Exhibit 4); Permit No. ENC 09-77, permitting the construction and maintenance of an outfall structure, energy dissipator and channel stabilization where diverted water would enter the East Branch Perkiomen Creek (PECO Exhibit 3); and Permit No. DAM 09-181, permitting construction of the Bradshaw Reservoir (PECO Exhibit 5).

On February 8, 1982, NWRA filed an application with the Department under the same statutes for a permit to construct and maintain a water intake structure in the Delaware River, an intake conduit crossing the Delaware Canal, a water main crossing Hickory Creek and an energy dissipator and outlet channel in the North Branch Neshaminy Creek. On September 2, 1982, the Department issued NWRA Permit No. ENC 09-81 (NWRA Exhibit 11), authorizing these construction and maintenance activities.

Each of the above permits has been appealed by at least one third party. In addition, two DER actions connected with--but distinct from--these permit approvals have been appealed, namely: (1) the issuance of a letter dated June 22, 1982, informing NWRA that no NPDES permit would be required for the release of water by NWRA to the North Branch Neshaminy Creek; and (2) DER's issuance of a Water Quality Certification to NWRA, by letter dated September 2, 1982, pursuant to the requirements of Section 401 of the Federal Clean Water Act, 33 U.S.C. §1341. In due course, all these appeals have been consolidated under the two docket numbers in the above captions.

II. FINDINGS OF FACT

The following Findings of Fact have been adopted with substantial additions, deletions and modifications from the proposed findings of fact submitted by DER, Friends of Branch Creek ("FBC"), NWRA and PECO. Del-Aware has not submitted any proposed findings.

A. General Background

1. The proposed Point Pleasant project will divert water from the Delaware River at Point Pleasant, Pennsylvania to provide public water supplies for Bucks and Montgomery Counties and supplemental cooling water for the Limerick Nuclear Generating Station in Pottstown, Pennsylvania. The maximum pumpage on behalf of NWRA for water supply needs through the year 2010 would be 49 mgd. A maximum of 46 mgd would be pumped on behalf of PECO for Limerick Units 1 and 2 (DER Exhibit 2 at 4-5; NWRA Exhibit 20 at 4-6; NRC Partial Initial Decision (March 8, 1983) (NRC PID)[1] at 51; PECO Exhibit 3 at 5; PECO Exhibit 11 at 3).

---

1. Designated as part of PECO Exhibit 7, the Partial Initial Decision of the NRC's presiding atomic Safety and Licensing Board in the Limerick proceeding, issued on March 8, 1983, was provided to the Board during the hearing (Tr. 3406-07).

2. The Point Pleasant pumping station will be developed and operated by NWRA on behalf of both project sponsors. NWRA is entitled to withdraw water from the Delaware River pursuant to Pennsylvania Water Allocation Permit No. WA-0978601. This permit was issued in 1978 after an extensive evaluation, summarized in the Department's "Report on the Application of Neshaminy Water Resources Authority for Water Allocation from Pine Run, North Branch Neshaminy Creek, and Delaware River" (November 1, 1978) (DER Exhibit 2 at 4, 17; Board Exhibit 4 at II-6).

3. PECO also holds a valid water allocation from the Delaware River awarded by the Delaware River Basin Commission (DRBC), and could implement a Point Pleasant project on its own solely as an industrial diversion facility even if the NWRA portion of the Point Pleasant project were not constructed (DER Exhibit 2 at 28).

4. The Point Pleasant pumping station will utilize pumps with a total capacity of 95 mgd and an intake located approximately 245 feet out into the channel of the Delaware River (DER Exhibit 2 at 5; NRC PID at 52).

5. The intake structure will consist of two parallel rows of cylindrical screen sections about 70 feet in length, located two feet from the bottom of the river and extending four feet upwards at that point. Even at a comparatively low flow of 3,000 cfs, the top of the intake would be approximately four feet under the water surface (DER Exhibit 2 at 82-83; NRC PID at 10, 53-55; NWRA Exhibit 14 at 1).

6. The intake will utilize an assembly of Johnston wedgewire screens, which constitute the "state-of-the-art" technology as compared to vertical traveling screens utilized in shoreline intakes at other facilities (DER Exhibit 2 at 5, 84; NRC PID at 10, 54; NWRA Exhibit 41 at 1; NWRA Exhibit 42; Kaufmann, Tr. 597).

7. Three intake lines below the channel bottom will convey water from the intake to the pumping station (DER Exhibit 2 at 5).

B. Cooling Water for Limerick

8. Water pumped from the Point Pleasant pumping station will be transmitted approximately 2.4 miles through a combined transmission main to the Bradshaw Reservoir, which will have an operating capacity of approximately 70 million gallons (DER Exhibit 2 at 6; Board Exhibit 4, Part III at 2-13; PECO Exhibit 10).

9. Water for NWRA will be delivered by gravity flow from the Bradshaw Reservoir to the North Branch Neshaminy Creek to Lake Galena, and ultimately to the North Branch Waste Treatment Plant at Chalfont (DER Exhibit 2 at 4).

10. DRBC Docket No. D-65-76 CP(8) represents DRBC's approval of the NWRA Neshaminy Watershed Plan and Water Supply Project adopted by DRBC on February 18, 1981, as unanimously approved by all DRBC members (NWRA Exhibit 20; Weston, Tr. 3426). The Corps of Engineers also approved the project. See *Del-Aware Unlimited, Inc. v. Baldwin*, Docket No. 82-5115 (Bench Opinion issued December 15, 1982, as modified by Bench Opinion Correction Sheet issued December 23, 1982); (3d Circuit, unpublished order, July 5, 1983 at Docket No. 83-1010); (rehearing denied, 3d Circuit, August 2, 1983).

11. A transmission main approximately 6.7 miles long will connect the Bradshaw Reservoir with the East Branch Perkiomen Creek, by which cooling water for Limerick will be conveyed to the East Branch. Another outfall structure is to be located on the East Branch approximately 200 feet upstream from Elephant Road, discharging cooling water to the East Branch. This water will then follow the East Branch for approximately 22 miles, and will ultimately be withdrawn by an intake located along the main stem of the Perkiomen near Graterford (DER Exhibit 2 at 6-7; Board Exhibit 4, Part III at 2-18 to 2-25; PECO Exhibit 2 at II-1).

12. The East Branch of the Perkiomen (East Branch) is a tributary of Perkiomen Creek, originating in central Bucks County and flowing generally northwest through the boroughs of Perkasie and Sellersville. In its headwaters, for some six miles above Perkasie and Sellersville, the East Branch is a small stream flowing through a rural, largely open area of farmland. It has one principal tributary in this reach, that being Morris Run.

13. In this six-mile headwaters section, the stream is largely unspoiled, flowing according to natural conditions. It is a "flashy" stream, subject to abrupt and high rates of run-off during rainfall, especially thunderstorms. Its flows are high in winter and low in summer, when it is reduced to a series of pools connected by riffles. (Tr. 1346).

14. The headwaters and the stream in general have good water quality, though they are somewhat turbid, principally from erosion of farmland in the stream basin. This erosion is not a permanent or necessary feature of the basin, but due to correctable land management practices.

15. The banks of the stream are also subject to erosion. This occurs during common spring run-off rates and volumes of flow, and does not require major flood flows of the magnitude of the annual flood or mean annual flood. (Tr. 701, 2846, 3215).

16. At and downstream from Sellersville and Perkasie, the character of the stream changes. The stream is dammed at Perkasie. A public sewage treatment plant discharges wastewater to the East Branch at Sellersville. Channel size and flows are substantially increased by tributaries joining the stream.

17. Maximum consumptive cooling water use at Limerick will be 21.3 mgd for one unit and 42 mgd for two units (DER Exhibit 2 at 8; PECO Exhibit 1 at 2).

18. On March 29, 1973, DRBC issued Docket No. D-69-210 CP which preliminarily approved the PECO portion of the Point Pleasant project and established, *inter alia*, the limits on withdrawals from the Schuylkill River (Weston, Tr. 3450; PECO Exhibit 1). Final approval for the PECO portion of the project was granted by DRBC on February 18, 1981 in Docket No. D-79-52 CP (PECO Exhibit 11).

19. Withdrawals from the Schuylkill River pursuant to the DRBC allocation are limited to the following conditions: (1) flows (excluding augmentation from DRBC-sponsored projects) measured at the Pottstown gauge shall exceed 530 cfs for one unit in operation; and (2) no withdrawals may be made when water temperatures in the Schuylkill below Limerick are above 15°C, except when the flow at the Pottstown gauge exceeds 1791 cfs (DER Exhibit 2 at 8; PECO Exhibit 1 at 5).

20. As a result of the temperature and flow restrictions imposed by the DRBC dockets, it is estimated that Limerick will be unable to withdraw cooling water from the Schuylkill 40 percent of the time, or 146 days a year (Runkle, Tr. 1152-53).

21. The historic record of flows of the Schuylkill River demonstrates, in light of conditions imposed upon PECO by DRBC, that if only one unit were operating at Limerick, Schuylkill flows would be available only 7 to 12 additional days of the year, i.e., roughly 3 percent more of the time than would be the case with two units. Therefore, whether Limerick ultimately has one or two units in operation makes little difference in the availability of Schuylkill water (Runkle, Tr. 1154; DER Exhibit 2 at 29).

22. Thus, even if construction and operation of Limerick Unit 2 were delayed or ultimately cancelled, cooling water requirements for efficient operation of Unit 1 would still necessitate completion of the Point Pleasant project in its present dimensions or the availability of a like amount of water from another source. (DER Exhibit 2 at 29; Boyer, Tr. 3899-C).

23. In the course of its evaluation, the Department assumed that there may be only one unit at Limerick, but nonetheless concluded that the Point Pleasant project was necessary regardless of whether there were one or two units (Weston, Tr. 2366-67).

24. In approving the diversion of Delaware River water at Point Pleasant for Limerick, DRBC provided that natural flows of the Perkiomen Creek, exclusive of any water pumped from the Delaware River, may be used only when the flow at the Graterford gauge exceeds 180 cfs for one unit in operation and 210 cfs for two units in operation (DER Exhibit 2 at 8; PECO Exhibit 1 at 6). Without regard to withdrawals at Graterford for Limerick, DRBC has further required that PECO maintain, through augmentation, a minimum flow of 27 cfs in the East Branch Perkiomen Creek at Bucks Road (downstream from Elephant Road) during the period in which Limerick is utilizing water pumped from the Bradshaw Reservoir. A minimum flow of 10 cfs must be maintained the remainder of the year (DER Exhibit 2 at 9; PECO Exhibit 1 at 6; PECO Exhibit 3 at 5; PECO Exhibit 11 at 6; Boyer, Tr. 3904).

25. Under the terms of DRBC's allocation for Limerick, diversions from the Delaware River are prohibited when withdrawals would reduce the flow at the Trenton gauge below 3,000 cfs. At such times, water may be diverted at Point Pleasant only if compensated in an equal amount by release from an upstream storage facility (DER Exhibit 2 at 9; PECO Exhibit 1 at 6; PECO Exhibit 11 at 5; Board Exhibit 4 at IV-6; NRC PID at 72).

C. Aquatic Life Impacts in the Delaware River

a. Entrapment and impingement

26. The most significant aquatic life impacts attributable to operation of a water intake are generally entrainment (passage of small planktonic or nektonic organisms such as fish eggs and larvae through the intake screens)

and impingement (capture of fish and other aquatic organisms on the screens) (DER Exhibit 2 at 30; Kaufmann, Tr. 596).

27. The passive Johnson wedgewire screens utilized in the Point Pleasant intake represent the "state-of-the-art" technology in water intake structures and substantially reduce any possibility of entrainment or impingement of aquatic life at Point Pleasant as compared to conventional screening (DER Exhibit 2 at 30-31, 84; Applicant's NRC Testimony at 3-5, ff. NRC Tr. 949; Boyer, NRC Tr. 1350;[2] Kaufmann, Tr. 683).

28. In terms of protection of the fish population, it is better to have the intake screen in its proposed location--245 feet out in the Delaware channel rather than along the bank as originally planned (Kaufmann, Tr. 683).

29. Shad avoid shadows so that even though they could swim below the intake structure they will probably veer towards either the Pennsylvania or New Jersey shores on sunny days. If they veer towards New Jersey the sport fishing on the Pennsylvania side of the Delaware would be diminished. However, in terms of any potential impact on sport fishing at Point Pleasant, there is no reason to believe that shad will veer toward either the New Jersey or Pennsylvania shore as a result of the intake structure (Kaufmann, Tr. 585, NRC PID at 38-39, 89). There is no evidence that anglers will not have access to the site once the intake is operational (Kaufmann, Tr. 586-87).

30. The slots in the intake screens to be used at Point Pleasant are only 2 mm. wide (DER Exhibit 2 at 31; Applicant's NRC Testimony at 4; NWRA Exhibit 41 at 10. This is smaller than the size of a water-hardened sturgeon or shad egg (Kaufmann, Tr. 607-08).

---

2. The NRC testimony was also a part of PECO Exhibit 7. See footnote 1, *supra*.

31. The maximum intake velocity through the screens is .5 fps, with an average velocity of .35 fps. The average intake velocity will decrease from about .071 fps at a distance of one foot from the screen's surface to .011 fps at five feet from the screen and to .0037 fps 10 feet from the screen (DER Exhibit 2 at 84; NRC PID at 59).

32. "Bypass velocity" is the speed of the river water passing directly in front of and parallel to the long axis of the intake. Although some experience with vertical traveling screens shows that a 2:1 ratio of bypass velocity to screen intake velocity is optimal for minimization of impingement and entrainment, the passive wedegwire screen to be utilized for the Point Pleasant intake provides considerable protection against impingement and entrainment at a 1:1 bypass, or even in the absence of any bypass velocity (NRC PID at 60-61).

33. Nonetheless, with a flow of 3,000 cfs the river velocity at the location and depth of the proposed intake has been measured at or in excess of the 1.0 fps required to provide a 2:1 bypass to intake velocity ratio, even at the maximum intake velocity (DER Exhibit 2 at 31, 83; NRC PID at 62; Kaufmann, Tr. 598-99).

34. Even at a low flow of 2,500 cfs, the minimum bypass velocity will be approximately .8 fps (NRC PID at 70).

35. The zone of influence of the intake velocity would only be approximately two inches (Kaufmann, NRC Tr. 1882).

36. The Department evaluated the potential impacts of the water intake structure on the shortnose sturgeon, an endangered species found in some reaches of the Delaware River (DER Exhibit 2 at 31).

37. Based upon a July 19, 1982 letter from William G. Gordon, Assistant Administrator for Fisheries, National Marine Fisheries Service to Lt. Col. Roger L. Baldwin, District Engineer, U.S. Army Corps of Engineers, and an attached

Biological Opinion rendered pursuant to Section 7 of the Endangered Species Act, *as amended*, 16 U.S.C. §1536, the Department concluded that: (1) the intake construction would cause no significant adverse effects on shortnose sturgeon present in the area; (2) the design of the water intake structure and projected schedule of withdrawals were adequate to ensure that juvenile and adult shortnose sturgeon as well as sturgeon eggs and larvae present in the area would not be significantly affected; (3) construction and operation of the pumping station would not likely jeopardize the continued existence of shortnose sturgeon in the Delaware River (DER Exhibit 2 at 31).

38. No shortnose sturgeon have been found at or above Point Pleasant, and there is no evidence that they spawn in or inhabit the Point Pleasant area (NWRA Exhibit 36 at 2-13; NRC PID at 73; Kaufmann, Tr. 587-88, 594). There is nothing peculiar to the Point Pleasant area that makes it a particularly desirable spawning environment for shortnose sturgeon. There are many other sites along the Delaware, upstream and downstream of Point Pleasant, that are suitable habitats as well (Kaufmann, Tr. 593, 697).

39. In any event, given the physical characteristics of sturgeon eggs and the benthic orientation and swimming ability of its larvae, entrainment and impingement of shortnose sturgeon would be highly unlikely (NRC PID at 73-78; Kaufmann, Tr. 697-98).

40. While most American shad spawn in the Delaware River upstream of Point Pleasant and pass through the Point Pleasant area during their migration, there would be no impingement or entrainment of juvenile or adult shad even if they spawned at Point Pleasant, because of their size and stage of development (NRC PID at 78-80; NWRA Exhibit 36 at 2-17). The yearly peak spawning period for American shad will have passed prior to the (summer) periods of the largest withdrawals at Point Pleasant (NWRA Exhibit 41 at 7).

41. Nothing in the Point Pleasant vicinity makes it unique as a shad spawning area for shad as compared to the rest of the Delaware River (NWRA Exhibit 41 at 8; Kaufmann, Tr. 691).

42. The operation of intakes utilizing less than "state-of-the-art" technology at three other power plants on the Delaware River in the traditional shad spawning area upstream from Point Pleasant has resulted in very little impingement or entrainment of American shad. Overall, those plants have not had a negative effect on the American shad population (Kaufmann, Tr. 695).

43. A single shad female lays an estimated 100,000 to 500,000 eggs, and less than 1 percent of these eggs would hatch even if unaffected by the intake (NRC PID at 83). The size and demersal (sinking) nature of shad eggs preclude entrainment or impingement of the vast majority of healthy eggs which would otherwise produce larvae (Kaufmann, Tr. 692-93).

44. Shad eggs, even if present at Point Pleasant as a result of spawning in the upstream pool where shad could conceivably spawn, will be no more particularly concentrated in the area of the intake than other places in that area of the river (Kaufmann, Tr. 610-11).

45. The main factors inhibiting the further growth and recovery of the American shad in the Delaware River are the dissolved oxygen block in the Philadelphia area (upper Estuary) and the locking out of shad from the Schuylkill River, Lehigh River and other tributaries by dams and other physical barriers (Kaufmann, Tr. 561, 743).

b. Dissolved oxygen and salinity

46. Historically, the dissolved oxygen block has been quite variable in terms of length. Normally, it extends from the Philadelphia area (30 miles downstream of Point Pleasant) to Chester (Kaufmann, Tr. 565-66).

47. The extent of the dissolved oxygen block is controlled by flow levels and water temperature, the latter of which is affected by industrial intakes and discharges in the Delaware Estuary (Kaufmann, Tr. 568-69).

48. For shad, the dissolved oxygen block acts as a barrier to passage upstream at a level of four parts dissolved oxygen per million parts water or less (Kaufmann, Tr. 566-67).

49. DRBC has concluded that the major causes of dissolved oxygen sags in the Delaware River are pollution loads from sewage treatment plant discharge and decay of organic debris (NWRA Exhibit 25 at 26-29; Kaufmann, Tr. 710).

50. Other factors that affect the dissolved oxygen level in the Delaware Estuary are tidal flows, temperature, precipitation, wind, climate and the level of photosynthesis (Kaufmann, Tr. 712-13).

51. Present data strongly suggest that dissolved oxygen levels are far more sensitive to minor variations in temperature than to relatively small diversions such as that at Point Pleasant (NWRA Exhibit 25 at 34; Rehm, Tr. 1467).

52. Even under extreme conditions of low river flow, e.g., 2,780 cfs, the maximum diversion of 95 mgd at Point Pleasant will result in a reduction in dissolved oxygen levels in Zone 2 (from Trenton to Philadelphia) of approximately only 0.08 mg/l. Reductions of this magnitude would produce virtually imperceptible changes in Zone 2 dissolved oxygen levels (Rehm, Tr. 1451-52, 1803). Further downriver, the effect is only about one-half (Board Exhibit 4 at IV-31).

53. The Department found that during normal periods, upper and lower basin reservoirs will be operated by DRBC to sustain the current minimum flow objective at Trenton of no less than 3,000 cfs (DER Exhibit 2 at 34). Withdrawals from the Delaware for Limerick are prohibited below this level unless

fully compensated by releases from utility-owned upstream storage (see Finding of Fact 25, *supra*).

54. A diversion of the maximum 95 mgd that will be taken by the Point Pleasant project represents less than 5 percent of the Delaware River flow when the flow at the Trenton gauge is 3,000 cfs (DER Exhibit 2 at 32, 84; Board Exhibit 4 at IV-15; NRC PID at 55; Rehm, Tr. 1848; Kaufmann, Tr. 711-12).

55. Water withdrawn at Point Pleasant for public supply by NWRA would be substantially a non-consumptive use, with substantial return of water via sewage treatment plant discharges to the Delaware River via the Neshaminy, Perkiomen, Pennypack and Wissahickon Creeks, and the Schuylkill River (NWRA Exhibit 5 at 6, 23; DER Exhibit 2 at 34, 36; Rehm, Tr. 1747). The anticipated consumptive use of only 10 percent will result in a total loss to the Delaware River Basin of less than 5 mgd (about one-fifth of one percent of a 3,000 cfs flow), which for practical purposes is not significant (DER Exhibit 2 at 34-34; Board Exhibit 4 at IV-17).

56. While NWRA may withdraw water at Point Pleasant when the flow at the Trenton gauge is below 3,000 cfs, DRBC has expressly conditioned such withdrawal upon the prohibition of nonessential water uses, as specified in DRBC Resolution No. 81-5 (to the extent applicable) and in "any other emergency resolutions or orders adopted hereafter". (NWRA Exhibit 20 at 16.)

57. At a low flow of 2,500 cfs at Trenton, the maximum diversion of 48.8 mgd for the year 2010 by NWRA for public water supplies would result in a reduction of Delaware River flows by less than 3 percent. Even during drought conditions, it is anticipated that basin reservoirs would be operated to maintain a flow at Trenton of at least 2,500 cfs (DER Exhibit 2 at 34; Del-Aware Exhibit 28 at 3).

58. Both the DRBC docket decision and the Commonwealth's permits regarding the allocation of Delaware River water at Point Pleasant indicate

that the allocations for public water supplies are subject to modification, restriction or suspension during any emergency declared by DRBC. (NWRA Exhibit 7 at 11; Finding of Fact 56, *supra*). This provision has been implemented in DRBC's Level B planning by identifying those times which are to be automatically considered drought warning or drought emergency periods when cutbacks will be effected (Weston, Tr. 2681).

59. Even assuming that the entire 95 mgd diverted at Point Pleasant were lost to the Estuary under a worst case analysis (i.e., lower than 2,000 cfs flow at Trenton), the assimilative wasteload capacity of the Delaware River would not be significantly affected or require a change in water quality wasteload allocations (Rehm, Tr. 1438-41).

60. Examining both the Level B Study results and the "Good Faith" Recommendations (Draft) (June 1982), the Department concluded that the interim salinity objective of 180 mg/l chloride at River Mile 98 can be met with existing flow management capability at Trenton, even during a record drought like that of the 1960's. The Department also concluded that salinity intrusion into the Delaware Estuary would not be exacerbated by withdrawals at Point Pleasant, since salinity control is dependent upon the combined flows entering the Estuary from the Delaware and Schuylkill Rivers and their tributaries. Salt water from the Delaware Bay is repelled by all flows which enter above River Mile 90, whether from the Delaware River mainstem or the Schuylkill River. Since nearly 90 percent of the NWRA withdrawal will be returned above River Mile 90, all but 5 mgd of the NWRA total allocation will aid in the repulsion of salt water (DER Exhibit 2 at 36; Board Exhibit 4 at IV-47; NWRA Exhibit 25 at 36; Runkle, Tr. 1096; Rehm, Tr. 1690-93, 1747).

61. Withdrawals at Point Pleasant for Limerick when flows exceed 3,000 cfs at Trenton present no significant concern for salinity control. As

for flows below 3,000 cfs at Trenton, withdrawals for Limerick cannot be made unless fully compensated by releases from an upstream storage facility, thereby resulting in an equivalent flow at the Trenton gauge as if no withdrawal had been made at Point Pleasant (DER Exhibit 2 at 36-37; Board Exhibit 4 at IV-47 to 48; see Finding of Fact 25, *supra*).

62. While Del-Aware's hydraulic witness attempted to establish that the "Good Faith" criteria could be artificially manipulated by management of upstream reservoirs to the detriment of salinity objectives in the Estuary (Phillippe, Tr. 3302-04), it was not established that any such manipulation of upstream reservoir releases had ever occurred or that DRBC, as the river manager, would tolerate any unfair or deceptive practice.

63. Because salt water intrusion will not be exacerbated by withdrawals at Point Pleasant, the oyster industry in the Delaware Bay could not be affected by the proposed project (Board Exhibit 4 at IV-32).

D. Aquatic Impacts in the East Branch Perkiomen Creek

64. The Department evaluated potential impacts upon the aquatic ecology of the East Branch Perkiomen Creek resulting from the discharge of pumpages from the Bradshaw Reservoir. In conducting this analysis, the Department reviewed DRBC's Environmental Impact Statement (1973) and its Final Environmental Assessment (August 1980), PECO's Environmental Report (July 1979) and Corps of Engineers reports (DER Exhibit 2 at 41-42; Ford, Tr. 2035).

65. The decision about these potential impacts was made by the Chief of the Planning Section in the Department's Bureau of Water Quality Management, who testified that he relied on the expertise and knowledge of the Department's Regional Water Pollution Biologist, Donald Knorr. (Tr. 1356; Environmental Assessment, p. 40)

66. The Chief of the Planning Section in fact had only a handful of informal discussions with Mr. Knorr, and Mr. Knorr had no direct input into the Environmental Assessment. Mr. Knorr did not make, and Mr. Knorr (and the Department) did not have the data adequate to make or support the conclusion in the Environmental Assessment (p. 40), that discharges of water to the East Branch would increase habitat size, decrease seasonal mortality and in general have a beneficial effect on aquatic biota. (Tr. 1353, 1356, 1358)

67. One of the present limitations on aquatic life in the East Branch is the lack of water during the summer (Knorr, Tr. 1346). Currently, the stream experiences very low summertime flows (Knorr, Tr. 1341; Runkle, Tr. 1501). The Q_{7-10} flow (defined at Finding of Fact 176, *infra*) at the mouth of the East Branch is .5 cfs (Kaufmann, Tr. 614).

68. At the present time, aquatic life and vegetation are restricted to standing ponds during low flow periods. As the ponds dry up, the aquatic life and vegetation are lost (Rehm, Tr. 1501-02).

69. Existing pool areas (i.e., standing water, now present in the East Branch under low or no-flow conditior will be eliminated by the addition of the diverted flow, and existing riffle areas will be enlarged (Harmon, Tr. 4043-E).

70. The minimum flow requirements established as a condition of the DRBC permits will ensure that fish and other aquatic life are provided with a flowing stream throughout the year (Harmon, Tr. 5043-C to D).

71. Essentially the same situation exists in the North Branch Neshaminy Creek, as to which NWRA's expert witness on aquatic life drew similar conclusions (Brundage, Tr. 3863-64).

72. Del-Aware's ichthyological witness, Mr. Kaufmann, agreed that minimum flow augmentation and increased flows resulting from the diversion in

the East Branch would result in an increased aquatic habitat and an improvement to the fishery (Kaufmann, Tr. 621). His opinion as to adverse impacts of increased sedimentation was premised on the belief that substantial erosion would occur as a result of these flows (Kaufmann, Tr. 641).

73. Turbidity tends to limit the diversity of aquatic life because primary productivity by aquatic plants is reduced due to the lack of sunlight penetration into the water. This results in less photosynthesis and less life at the base of the food chain. Additionally, deposition of soil materials from turbid water into the rocky substrate of a riffle type bottom will limit the existing habitat and life forms present (Knorr, Tr. 1339-40).

74. Predicting impact upon aquatic life in the East Branch or North Branch from increased turbidity would require knowledge as to the level of turbidity, the length of time that the stream was exposed to these levels of turbidity, the type of life that initially existed in the stream and the morphological characteristics of the stream (Knorr, Tr. 1350). Stream depth and velocity through the riffle area and pools would also be factors, since turbidity will restrict aquatic life to a certain level of sunlight penetration (Knorr, Tr. 1351).

75. If the turbidity that might be caused by the project is of short duration, it will not be lethal to fish (Harmon, Tr. 4043-C, 4069-71; Rehm, Tr. 18520. If high levels of turbidity last for less than one full growing season, a new balance will quickly be established (Harmon, Tr. 4069-70; Rehm, Tr. 1852-53, 1878-79; Ford, Tr. 1963). Assuming short-term turbidity, any loss in aquatic life will not be significant and the overall quality of the East Branch aquatic life will improve with time (Harmon, Tr. 4043-C).

76. Based on his familiarity with the East Branch and similar streams, the Department's Water Pollution Biologist concluded that a rocky-bottomed stream

of riffles and pools, such as the East Branch, would be very adversely affected by soil deposition and high levels of long-lasting turbidity, and that this would severely reduce the varieties of life forms and life habitats in the substrate. (Tr. 1340).

77. For reasons described in detail below, it is anticipated that significant erosion and resulting turbidity can be eliminated if the velocity of the East Branch of Perkiomen Creek is kept below two feet per second; the same statement pertains to the North Branch of Neshaminy Creek.

E. Riparian Impacts in the East Branch Perkiomen Creek

a. Existing stream regime and increased flows

78. The East Branch Perkiomen Creek is highly eroded as a result of storm events and poor land management practices (Steacy, Tr. 3580-E; Kaufmann, Tr. 613, 671-72, 677-78). Many farms along the East Branch use poor land management techniques, such as failing to use contour plowing, planting too close to the stream bank without buffer strips, and grazing cattle near the banks. The resulting run-off creates erosion of stream banks and, ultimately, a large amount of siltation (Kaufmann, Tr. 613, 652-53, 678-80, 740-41). Run-off is also caused by the roadways criss-crossing the East Branch (Kaufmann, Tr. 741-42).

79. High stream velocity is the principle cause of channel configuration (Steacy, Tr. 3580-D, 3610; Ford, Tr. 2169; Harmon, Tr. 4033; Dresnack, Tr. 4434-35, 4449). Large floods with velocities as high as 7-10 fps have caused and will continue to cause the erosion occurring in the East Branch (Steacy, Tr. 3580-E, 3795; Board Exhibit 4 at IV-64; Kaufmann, Tr. 619). These very large flows with high velocities, rather than average flows with low velocities, create the channel configuration in a stream (Steacy, Tr. 3778-79, 3839; Dresnack, Tr. 4362; Harmon, Tr. 4017-19).

80. The dominant discharge, the 1.5 year flood (average recurrence interval of 1.5 years) which is assumed to be bank full flow, effectively determines the shape of the stream channel (Harmon, Tr. 4029-31, 4034, 4070, 4077-78; Dresnack, Tr. 4354).

81. While the additional pumpages into the East Branch Perkiomen Creek and North Branch Neshaminy Creek may be large in proportion to the median flows at the point of discharge, they are by no means large in comparison to the flows exhibited during storm events occurring annually or every few years (Dresnack, Tr. 4370); they are well within the 1.5 year flood and thus will not be expected to substantially alter the channel configuration.

82. Flows substantially below those associated with 1.5 year floods can cause substantial erosion of stream banks and bottoms and can, therefore, result in unacceptable turbidity in the stream. This erosion begins above a critical or threshold velocity which depends upon the type of soils encountered by the stream and the type and amount of materials already being transported by the water entering the stream.

83. The median flow at Elephant Road plus the maximum pumpage yields a flow of 66.4 cfs with a velocity of 3.02 fps as calculated by Mr. Steacy. A one-year flood at that site has a flow of 112 cfs with a velocity of 3.7 fps, while the mean annual flood has a flow of 320.0 cfs with a velocity of 5.1 fps (DER Exhibit 2 at p. 42; PECO Exhibit 2, Section IV at 4, Tables Nos. 2 and 3).

84. The possibility of erosive velocities downstream of an outfall would be a consideration for any project under the general criteria of Chapter 105 Subchapter A of the Department's regulations, which require the Department (when reviewing the environmental impacts of a project) to review the effects of a project on stream regime (Weston, Tr. 2494). Such consideration would mandate an effort to mitigate any erosive impact to the extent possible, in-

cluding the implementation of necessary protective measures. If mitigative measures could not reduce the impact to an insignificant level, the Department should consider whether on balance the need for the project outweighed the significantly adverse impact remaining after mitigation. The Department has yet to make such a balance since the Department feels that the erosional impacts will be insignificant. (Weston, Tr. 2495).

85. According to a bore hole analysis conducted by PECO's agent, the soils in the bank of the East Branch are classifiable as silty loam. According to PECO's application the soils to be excavated for the Bradshaw Reservoir also are classifiable as silty loam. PECO's expert witness, Robert Steacy, considered the soils of the East Branch bank and bed to be ordinary firm loam, but Mr. Steacy was not qualified in the science of soils analysis and was testifying from his visual examinations during a single field visit. Thus, his testimony in this regard must be accorded little weight.

86. Applying the Fortier and Scobey tabulations set forth in the "Handbook of Hydraulics" (E. Brater and H. King, 6th ed.) (PECO Exhibit 12), recognized as authoritative by the American Society of Civil Engineers, and assuming the soils of banks of the East Branch to be silty loam, the critical velocity is 2.0 fps for clear water (PECO Exhibit 12 at 7-24; Steacy, Tr. 3580-E, 3746; Dresnack, Tr. 4372).

87. Water containing greater amounts of colloidal matter has less effect than clear water in removing additional material. Correspondingly, turbid water is less erosive than clear water, at a given velocity. Thus, the range of permissible channel velocities for a formed and shaped channel is 2.0 - 2.25 feet per second (fps) for clear water, 2.5 fps for slightly turbid water, and 3.5 fps for highly turbid water; the lower value of 2.0 - 2.25 fps is most representative of water turbidity of the discharge into the North Branch and the East

Branch. This lower value takes into account the settling of sediments in Bradshaw Reservoir. It also takes into account the fact that Delaware River water may be substantially clearer than present sediment-carrying run-off from farmland especially in the East Branch watershed. The permissible channel velocity of 3.5 fps relied on by the Department in permitting the discharge was unreasonable (Tr. 3157-58, 3767, 3774).

88. The range of permissible channel velocities was developed for use in dimensionally regular channels, such as canals. The permissible channel velocity must be reduced further when channels are natural and flows are turbulent, as they are in the East Branch at and below the discharge point (Tr. 3053, 3770, 3231).

89. Aged canals and natural streams resist erosion better than new canals because colloidal material disperses into the interstices of the banks of a stream and gradually coats the sides of the stream bank. It provides a firm matting, or armor plating, which increases resistance to erosion (Steacy, Tr. 3610-11, 3761-63, 3774; Dresnack, Tr. 4373, 4470). A stream bank composed of a mixture of materials is more resistant to erosion than a single material (Steacy, Tr. 3611, 3744). Since the Brater and King Table is for aged canals, this effect has already been considered.

90. If erosion should occur as a result of the diversion, the Department has mandated that corrective action must be taken. Condition L in Permit 09-77 provides that PECO shall monitor the East Branch on a regular basis downstream to the point that its pumpages have no further significant effect. PECO must correct any damage caused by the diversion (PECO Exhibit 3 at 5; Ford, Tr. 1962-63, 2054, 2057; Weston, Tr. 2302-05). A similar condition is in NWRA's permit.

91. If the diversion causes bank damage downstream of the outlet, PECO can correct it by using riprap, gabion structures, i.e., wire baskets filled with rock, or flood walls (Ford, Tr. 2042, 2055). If property owners refuse to allow PECO (or NWRA) onto their land to correct the problem, the Department must either waive the particular condition for that property owner or enter and correct the condition itself under the Prevention and Control of Floods Act of 1936 (Weston, Tr. 2304). Condition L does not address ongoing damage to the aquatic community of the East Branch or North Branch which might be caused by continued erosion.

b. Avoidance of increased flooding

92. As a condition of its allocation of water for Limerick, DRBC has required that during periods of high natural flow in the East Branch Perkiomen Creek, "pumping from Point Pleasant shall be kept at a level so as not to aggravate high water levels" (PECO Exhibit 1 at 6; PECO Exhibit 11 at p. 5).

93. USGS will install and maintain a standard stream gauging station on the East Branch at Bucks Road, slightly downstream of the outfall. The installation of this gauge will ensure that PECO will have the capacity to monitor East Branch flows continuously and accurately. The same information will be transmitted to DRBC, for monitoring to ensure compliance with the DRBC docket condition requiring that pumpages shall not aggravate high water levels in the East Branch (Steacy, Tr. 3580-C, 3584).

94. The pumping station at Bradshaw will be fed flow data translated from gauge readings at Bucks Road and Graterford, the latter of which is the point in the main stem of the Perkiomen Creek where water will be withdrawn for Limerick (Boyer, Tr. 3903-04). When the flow in the East Branch approaches potential flood levels, an alarm will be automatically activated at the pumping control center, and the pumps (if operating) will be stopped (DER Exhibit 2 at 42; Ford, Tr. 2053; Boyer, Tr. 3905-06).

95. Utilizing information from the gauging station, the Bradshaw pumps (if operating) therefore shall be stopped well in advance of the point at which further pumpages might cause the flow at Elephant Road (the narrowest cross-section of the East Branch) to reach an equivalent one-year flood condition at 112 cfs (DER Exhibit 2 at p. 42; Board Exhibit 4 at IV-57 to 60; Steacy, Tr. 3580-C to D; PECO Environmental Report, Section IV, Table 3).

96. There would be no problems of limiting cooling water flow to Limerick caused by shutting off the Bradshaw pumps well before the flow at Bucks Road reaches 238 cfs. Assuming a generalized rain event, suppose the flow at Bucks Road (Station 13) is 238 cfs; then it will be 1,470 cfs at Station 1 downstream, and even significantly greater at the Graterford intake for Limerick on the main stem of the Perkiomen (Ford, Tr. 2164, 2166). Such heavy flows vastly exceed the flow at which PECO may withdraw water at Graterford per DRBC docket conditions (see Finding of Fact 24, *supra*). Under such conditions, there would be no reason for any pumping from Bradshaw to replace water drawn at Graterford (Boyer, Tr. 3904).

97. Further examination has indicated that the pump cutoff flow value at Bucks Road can be reduced to 125 cfs (i.e., less than 112 cfs upstream at Elephant Road) for two units and probably 75 cfs for one unit (Boyer, Tr. 3906). The Department has no objection if PECO sets a lower cutoff value than presently planned for the gauge at Bucks Road (Weston, Tr. 3460-61).

98. Final designation of an operating plan for the cutoff, including the actual cutoff figure, will depend upon the record accumulated from the new gauge at Bucks Road. The data from these actual measurements will provide the most meaningful basis for selecting the appropriate cutoff value (Steacy, Tr. 3842-43).

99. Limerick will operate with only one unit for two or three years at least, and thereafter unless and until the second unit is complete. Pumpages from the Bradshaw Reservoir will be only half of the maximum 65 cfs during that time. This will provide ample time to obtain accurate data from the Bucks Road gauging station, and will help season the creek to the new flow regime (Steacy, Tr. 3845).

100. Inasmuch as the Department determined that there would be no pumpages during flood flows, it did not find a need to analyze any potential for flood damages downstream through a loss of flood plain storage (Ford, Tr. 2051-52).

101. Since pumping will be unnecessary when the natural flows in the Schuylkill River and Perkiomen Creeks are adequate to provide cooling water for Limerick and to meet the minimum flow requirements imposed by DRBC, PECO will not be required to pump water from the Bradshaw Reservoir throughout the entire year. It is anticipated that pumpages from the Bradshaw Reservoir will be necessary from roughly mid-April to mid-November under average stream flow conditions, during which time the estimated average pumpage rate will be 34 cfs (DER Exhibit 2 at 42; PECO Exhibit 2 at Table No. 1 ff. 4; Runkle, Tr. 1148).

102. Pipeline drainage lag-time will not present a problem in terms of flooding. The pipeline between the Bradshaw Reservoir and East Branch goes over an uphill divide, such that in excess of half the water between the reservoir and the East Branch will remain in the pipe after the pumps are shut off (Steacy, Tr. 3844). The water on the East Branch side of the divide will run out within 10 minutes after the pumps are shut off (Steacy, Tr. 3841).

F. Water Quality Impacts in the East Branch Perkiomen Creek

103. The Department's water quality review for the Point Pleasant project was initially conducted with respect to the issuance of a water quality certifica-

tion under Section 401 of the Federal Water Pollution Control Act (Rehm, Tr. 1394-97). In the spring of 1982, the Department conducted an additional review based upon comments received in response to the public notice of an opportunity for comments with respect to the request for the Section 401 certification (Rehm, Tr. 1395). The water quality certification was issued by letter dated September 2, 1982 from the Department (Del-Aware Exhibit 39).

104. As part of its ongoing water quality review of the Point Pleasant project, the Department examined the effects of the diversion on water quality in the East Branch Perkiomen Creek using water quality analyses prepared by DRBC, EPA and NWRA's private consultant. The data it relied upon represent stations in the Delaware River near Trenton and in the Tohickon below the Nockamixon Dam. The Department also had data from various agencies for the East Branch (Rehm, Tr. 1454, 1506-08, 1525, 1615-16, 1807-08, 1810-12).

105. Within the Department, water quality analysis under the permit application was coordinated by Charles Rehm, Chief of the Planning Section of the Bureau of Water Quality Management (Tr. 1393).

106. Water quality data for Point Pleasant itself were not available. The Department therefore used water quality data from Trenton, New Jersey, and assumed that the water withdrawn at Point Pleasant was equivalent, though probably somewhat better quality than, the Trenton data indicated. Trenton data were assumed indicative of Point Pleasant water quality because Trenton is downstream; because additional effluent is added in the Point Pleasant-Trenton reach, it was assumed Trenton water quality could only be worse than Point Pleasant quality (Tr. 1536, 1596).

107. The Department had available and considered STORET water quality data for Lumberville, New Jersey, two miles downstream from Point Pleasant. It chose Trenton, New Jersey, data as "more representative" because it included a

greater number of samples, assumed to be within the range of values or "within the window that the Trenton gauging station was reporting". Lumberville data in fact shows significant variation from, and greater pollution than, Trenton data (Tr. 1608-09, 1618-19).

108. Data from sampling performed on either side of the Delaware River are indicative of the quality of water that would be withdrawn at Point Pleasant. While individual discharges may create some locally higher concentrations, these would be quickly eliminated by mixing of the waters. In addition, no substantial evidence of any single discharge causing an aberration was shown. Mr. Rehm tried to explain the high level of organics below Fieldsboro, New Jersey, as due to an industrial discharge there, but the organics were both industrial and pesticide chemicals and Mr. Rehm's suggestion, which was itself guarded, is not credible (Tr. 1586, 1614, 1616, 1738).

109. Water quality data from samples collected closer to the point of withdrawal are more indicative of the quality of water to be withdrawn. More frequent samplings at a distant point do not necessarily make those samplings more accurate or more indicative (Tr. 1608-09, 1818-19).

110. The Department determined that the discharge would have a significant impact on the water quality of the section of the East Branch above the Penn Ridge sewage treatment plant (12 kilometers), where present water quality is good and the discharge would be a substantial portion of flow. The Department determined that the discharge would not have a significant impact on the section of the creek below the sewage treatment plant. The Department therefore concluded that there would be no significant impact on the entire East Branch (Tr. 1426-27).

111. Water quality data at the outfall on the East Branch were not available. The Department therefore used water quality data at Station 160,

downstream from the Penn Ridge sewage treatment plant. The Department did not seek to obtain water quality data on the upper reaches, available from the County of Bucks (Tr. 1727). Water quality data downstream of the sewage treatment plant do not reflect water quality at points above the treatment plant, including the point of outfall. Measurements may be in error by as much as a factor of 20 (Tr. 1734).

112. The Department has developed a statewide water quality standard applicable to the East Branch, of 50 micrograms per liter of lead. The mean of 17 samples taken near Riegelsville, 18 miles upstream from Point Pleasant was 311 micrograms per liter for lead. If water discharged to the East Branch would reflect these lead values, it would violate the water quality standard six times over. Even the Trenton date showed, and the Department determined, that the mean value for lead in the Delaware River in the vicinity of Point Pleasant was 51.4 micrograms per liter. The statewide standard under Chapter 93 of the regulations is 50 micrograms per liter (Del-Aware Exhibit 46; Rehm, Tr. 1526). The value utilized for comparison, taken from sampling at Station 160 in the East Branch was 35 micrograms per liter (Del Aware Exhibit 46; Rehm, Tr. 1530-31).

113. Reasonably expectable water quality in the water withdrawn at Point Pleasant, as determined from Lumberville STORET data, would violate water quality standards for discharges to the East Branch for at least three heavy metals and phosphorus. Copper concentrations could be near 7 micrograms per liter, or about twice the applicable standard. Iron concentrations would be near 110 micrograms per liter, or about 115% of the applicable standard. Zinc concentrations would be near 4700 micrograms per liter, in excess of three times the applicable standard. Phosphorus standards also would be exceeded. (Del-aware Exhibit 55; Tr. 1608-09, 1612). Fecal coliform bacteria have been observed in the Delaware near Point Pleasant (DER Exhibit 2, p. 52).

G. Archeological, Historical and Aesthetic Impacts at Point Pleasant

a. Archeology

114. The Department reviewed the Point Pleasant project and determined that it would not cause any adverse impacts upon the historical and archeological resources of the area (DER Exhibit 2 at 62).

115. An archeologically stratified site exists in one small section of the Point Pleasant project site, in the area between the Canal and the Delaware River (Landis, Tr. 385). This area comprises approximately a 75 foot square (Landis, Tr. 419). Otherwise, 95 percent of the total area of the Point Pleasant diversion project site is devoid of significant cultural resources (NWRA Exhibit 1 at 6).

116. Stratification is important because it enables one to determine the chronology of the area's inhabitants (Landis, Tr. 347-48). However, not all stratified sites are archeologically significant (Landis, Tr. 384).

117. No conclusions can be made as to the significance of this site until its material has been analyzed (Landis, Tr. 408).

118. The Advisory Council on Historical Preservation, the State Historic Preservation Officer, the Army Corps of Engineers and NWRA have entered into a Memorandum of Agreement for the conduct of an archeological survey of the Point Pleasant site and preservation of any significant archeological resources (NWRA Exhibit 18; Ford, Tr. 2193; DER Exhibit 2 at 62).

119. Although the Department was not a direct participant in the negotiation of this Memorandum of Agreement, the Army Corps of Engineers provided copies of materials pertinent to those discussions to the Department. In its consideration of appropriate mitigative measures to assure compatibility of the project with the area and to protect historical and archeological resources, the Department reviewed the draft Memorandum of Agreement, which it found

sufficient to preserve the integrity of any finds. The Department therefore conditioned the permit it issued to NWRA upon compliance with the Memorandum of Agreement (Weston, Tr. 3434-38; NWRA Exhibit 18; DER Exhibit 2 at 62).

120. Pursuant to the Memorandum of Agreement, a preliminary archeological investigation of the Point Pleasant project site was conducted by Gilbert Commonwealth Associates, a professional archeological consulting firm retained by NWRA (NWRA Exhibit 18 at 7; Landis, Tr. 340-41).

121. The purpose of this initial survey was to determine whether any archeologically significant area existed on the Point Pleasant project site and, it so, whether it should be excavated for complete data recovery or preserved in place (NWRA Exhibit 18 at 5-6; Landis, Tr. 415-16).

122. Del-Aware's archeological witness worked four days in November 1982 as a field worker for Gilbert Commonwealth Associates, the archeological consulting firm retained by NWRA for investigation of the Point Pleasant site (Landis, Tr. 341-43). He expressed his opinion that the Gilbert Commonwealth investigation was adequate for that purpose (Landis, Tr. 416).

123. The Memorandum of Agreement also provides that, once construction begins, an archeologist competent in the methods and procedures of prehistoric archeology will be stationed onsite to monitor the excavations and any archeological remains which might be encountered during the course of construction (NWRA Exhibit 20 at 15; Landis, Tr. 400, 415, 430). Del-Aware's archeological witness agreed that these measures will properly preserve the historic record (Landis, Tr. 400-01).

124. In a procedure approved by the Pennsylvania State Historical Preservation Officer, the archeologically sensitive area itself will not be excavated at this time but will be preserved in place (NWRA Exhibit 18 at 6; Landis, Tr. 402, 415). An access road will pass adjacent to the archeologically

sensitive site, but no structure will be placed there. Measures have been taken to chain off the site and prevent vehicular access (Landis, Tr. 401-03). A plastic cover will be placed over the area and covered with earth (Landis, Tr. 415, 432).

125. The measures approved by the Pennsylvania Historical Museum Commission will exclude large machinery from the archeologically sensitive area (NWRA Exhibit 18 at 6; Landis, Tr. 424).

126. Considering the difficulties in obtaining adequate resources to investigate the area, and recognizing the possibility of intrusion by the activities of man, Del-Aware's archeological witness acknowledged that the investigation of the Point Pleasant area, undertaken as a direct result of the Point Pleasant project, is a very worthy accomplishment (Landis, Tr. 425-27). By contrast, the activities of man have substantially destroyed the integrity of other portions of the stratified area in the vicinity of the construction site. Even portions of the potentially stratified area have been previously disturbed (NWRA Exhibit 1 at 4; Landis, Tr. 421).

127. If the Point Pleasant project were not going to be constructed, there would be no controls in place to protect archeologically sensitive areas, which would otherwise be as subject to disturbances and destruction as the adjacent private property has been (Landis, Tr. 428).

b. Aesthetics

128. A full set of drawings and artistic renderings showing landscaping plans for the Point Pleasant pumping station were submitted by NWRA; these documents were reviewed by various DER personnel during DER's evaluation of the aesthetic impacts of the project (Ford, Tr. 2135-38). These officials agreed that construction of the project will not harm the Delaware division of the Pennsylvania Canal aesthetically and that the project is compatible with the park

and its functions (Weston, Tr. 2405-14). In so agreeing, DER officials again relied (in part) on the above Memorandum of Agreement, which included requirements intended to minimize the aesthetic impact of the pumping station on Point Pleasant (See Finding of Fact 136, *infra*).

129. The Historic and Museum Commission and the Corps of Engineers also reviewed the proposed pumphouse, and found that it would have no adverse effect on the Point Pleasant historic district. In reaching this decision, the Corps of Engineers concluded that the pumphouse will be small, quiet, inconspicuous, built of appropriate materials, and carefully landscaped so as to blend in with its surroundings (NWRA Exhibit 44; Tr. 2077; NWRA Exhibit 23.) On this basis, the Department concluded that the project would have at most a very slight aesthetic impact on the surrounding area (DER Exhibit 2 at 45).

130. The NRC has required that any noise problems caused by the pumphouse must be mitigated (Weston, Tr. 2420; NRC PID at 101).

c. Historical and physical

131. Not only will the construction of the Point Pleasant intake cause no harm to the Canal (Oberdorfer, Tr. 1662; Nuss, Tr. 2020), but construction procedures and future maintenance requirements will ensure that it will be left in better shape after construction is completed than it is at this time (Weston, Tr. 2405; NWRA Exhibit 12 at 2; see Del-Aware Exhibits 59 and 60). The easement granted NWRA simply involves minor patch-up work (Oberdorfer, Tr. 1670).

132. Breaches in the Delaware Canal have occurred dozens and maybe hundreds of times, both man-made and naturally as the result of floods (Oberdorfer, Tr. 1670). Through the 60-mile length of the Canal there are at least 127 water, sewer and other utility crossings, along with 135 public and private bridges and culverts providing access and transport (NWRA Exhibit 12 at 2).

133. Prior to the issuance of a construction permit to the NWRA, the U.S. Army Corps of Engineers consulted with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, pursuant to the National Historic Preservation Act of 1966, 16 U.S.C. §§470(f) and 470h-2(f), to insure the protection of the historic and archeological resources at Point Pleasant, Bucks County. This consultation resulted in the signing of a "Memorandum of Agreement" outlining the measures to be taken by the NWRA to protect and preserve these resources (NWRA Exhibit 18).

134. The "Memorandum of Agreement" outlines the measures to be taken to protect the Delaware Canal during construction of the Point Pleasant project: Any required blasting is to be controlled through procedures established by the DER; during excavation, a qualified professional archeologist must record cross sections and other information through appropriate photographs and drawings; following construction, the Canal and Canal towpath must be restored to their original appearance in consultation with the State Historic Preservation Officer; following construction, the Canal and Canal towpath banks must be reshaped, graded, seeded and landscaped to their preconstruction contour including the placement of an impervious clay liner; and, during construction, machinery disturbances in the vicinity of the canal must be kept to a minimum (NWRA Exhibit 18, pp. 3-4).

135. Based upon the requirements imposed by the Memorandum of Agreement, the Department, after its own independent review, concluded that the construction of the Point Pleasant Pumping Station would have no adverse permanent impact on the Delaware Canal (Nuss, Tr. 2020; Del-Aware Exhibits 59 and 60; NWRA Exhibit 12).

136. To protect the Point Pleasant Historic District, the Memorandum of Agreement required design plans and specifications for the Point Pleasant

Pumping Station and boundary fencing to be developed in consultation with the State Historic Preservation Officer, and to be approved prior to construction. Additionally, a landscaping plan, consistent with the existing natural setting of the area, has to be developed to minimize the visual impact of the pumping station and boundary fence (NWRA Exhibit 18, pp. 4-5).

137. The Department also conditioned permit approval on NWRA landscaping the Point Pleasant site with flora indigenous to the area (NWRA Exhibit 11, Special Condition K).

H. Wetlands

138. Only a small area of wetlands contiguous to the Delaware River, approximately 0.308 acres, will be affected by the Point Pleasant project. This area is about one-third of the 0.93 acres of wetlands on the site. These wetlands are typical of many flooded plain forests in southeastern Pennsylvania (DER Exhibit 2 at 66).

139. Based upon the abundance of wetlands with similar characteristics in southeastern Pennsylvania, the Department determined that the small wetland area involved at Point Pleasant was not an "important wetland" within the meaning of Section 105.17 of its regulations. Nonetheless, efforts have been undertaken to minimize and mitigate unavoidable impacts by the project, so that only 0.22 acres of wetlands will be permanently destroyed by the placement of fill. The remaining 0.08 acres of affected wetlands will be restored to original grade and pre-construction conditions (DER Exhibit 2 at 66-67).

140. Mr. Hershey, as witness for Friends of Branch Creek ("FBC") and Del-Aware, identified at least 75 acres of wetlands on the East Branch in or along the affected portion of the stream, using guidelines for identification prepared by the Bucks County Planning Commission, as well as other sources (Tr. 2895-2897).

141. The Bucks County Planning Commission has independently identified wetland areas on the East Branch, which are indicated as existing extensively along the affected portion of the stream. (FBC Exhibit 25, with supplements required by the Examiner at Tr. 4182). However, since the appellants did not carry their burden of proving that the discharge would cause the East Branch to overtop its banks or otherwise inundate any wetlands, there has been no demonstrated effect on wetlands.

I. Alternatives

a. Scope

142. Alternatives to the Point Pleasant project considered by the Department included those previously studied by DRBC and the Army Corps of Engineers in the issuance of their respective permits for the project. Other alternatives, suggested by representatives of Del-Aware and the Applicants, were also studied (Weston, Tr. 2452).

143. Friends of Branch Creek took the position that pumping the water for Limerick further downstream, to a discharge point at Sellersville, would be an alternative to the proposed transport system involving discharge near Elephant Road (Neill, Tr. 6). The Department apparently did not consider this alternative but there is no evidence that this alternative was presented to the Department prior to the hearing.

144. The Department considered a great many alternatives to the Point Pleasant project, but did not specifically describe their various combinations and permutations in the Environmental Assessment. Rather, the Environmental Assessment was designed primarily to represent the Department's understanding of the basic options available (Weston, Tr. 2451, 2472, 2479, 3524-25). Del-Aware did not suggest to the Department at the April 14, 1982 meeting or any other time any particular combination of alternatives it wished to have considered (Weston, Tr. 2452-53).

145. The Department decided to devote a specific section in the Environmental Assessment to the discussion of alternatives, after Del-Aware broached the topic in the April 14, 1982 meeting (Ford, Tr. 1924).

146. The Department previously had performed a very detailed review of alternatives for public water supply systems and consumptive use makeup by other water users, as a part of the State Water Plan; this information was included in the Department's consideration (PECO Exhibit 6 at 3; Weston, Tr. 3457-58). Some of this information was updated for the specific purpose of compiling the Environmental Assessment (Weston, Tr. 3641). The State Water Plan utilized a matrix approach for evaluating alternatives for public water supply systems and industrial consumptive uses (Weston, Tr. 3468-69).

147. In addition to reviewing the alternatives outlined in its Environmental Assessment, the Department also examined the alternatives discussed in the DRBC Level B Study (NWRA Exhibit 25) and in the Merrill Creek Draft Environmental Impact Statement. The latter was a report prepared by the Delaware River Basin Electrical Utilities Group, which examined alternative reservoir sites for makeup water for various power plants, including Limerick (Weston, Tr. 3457).

148. The DRBC Level B Study is regarded by the Department as an official recordation of the DRBC's rules and policy regarding Basin management, which have the force and effect of a regulation so far as water management by the Department is concerned. DRBC approval of the project under application is a prerequisite to issuance of a permit by the Department (Weston, Tr. 3440-42).

149. After examining all the options from the viewpoint of minimizing environmental impacts and maximizing cost effectiveness considerations under the State Water Plan, the Department determined that (from a long-term planning

standpoint) a combined system which integrated existing retail public water supply systems with a wholesale public water supply system, and also solved a major industrial user's (PECO's) water management requirements, made the most sense (Weston, Tr. 3440, 3494-95).

150. In reviewing the PECO permits under the Dam Safety and Encroachments Act, the Department considered compliance not only with its own regulations under Chapter 105, but also with all other laws and regulations administered by the Department and by the Delaware River Basin Commission (Weston, Tr. 3440-42).

151. Any one of the permits would have been denied if the Department's review of the application showed a violation of Chapter 105 of its regulations (Weston, Tr. 2489-90).

152. After reviewing all the alternatives, the Department found the Point Pleasant project to be the most reasonable regional solution to meet the needs of Bucks County, Montgomery County and Philadelphia Electric Company (Weston, Tr. 2604).

b. Groundwater

153. Conjunctive management is a term of art used by water resource managers to mean the systematic joint development and use of ground and surface waters. Conjunctive management has been the thrust of the policy underlying the State Water plan and the actions of the DRBC in past years. The Point Pleasant project is one of the prototypical conjunctive water management projects, because it represents a ground and surface water supply system for the region it serves (Weston, Tr. 2603).

154. Both the Environmental Assessment and the State Water Plan assume that groundwater in Bucks and Montgomery Counties will continue to be used, and further assume that in the more developed areas whose public water supply systems

now rely on groundwater, conjunctive water use management will be utilized to obtain additional water from surface supplies (Weston, Tr. 2453-54).

155. For the service area of the NWRA project, the combination of water supply alternatives contemplated by the Environmental Assessment and authorized by the permits on appeal is consistent with a continuing use of groundwater (which most of the retail systems in that area currently rely on almost exclusively) as part of a conjunctive management plan. Under this plan, groundwater will be utilized with supplemental water from surface sources, including numerous interconnections with other retail systems such as the Philadelphia Suburban Water Company and the City of Philadelphia (Weston, Tr. 2600-01; see NWRA Exhibit 5 at 8, 11, 33-34).

156. Further development of groundwater as the exclusive source of public water is not viable. This source is already highly stressed and, as a result, all of Montgomery County and part of Bucks County is regulated by DRBC as a groundwater protected area (DER Exhibit 2 at 25; NWRA Exhibit 5 at 4; Runkle, Tr. 1184-85; see also 29 C.F.R. §430). For example, many of the water supply systems in Central Bucks and Montgomery Counties relying on groundwater have experienced difficulty in providing adequate water supplies to their customers in recent years, even those years that were not unusually dry. Moreover, this area is rapidly urbanizing and can expect growing water shortage problems (NWRA Exhibit 5 at 8, 15).

157. The Neshaminy Water Supply System area is located predominantly within the groundwater protected area designated by DRBC as a critical water supply area (Runkle, Tr. 1184-85).

158. In assessing the groundwater alternative, the Department examined the normal recharge rates of the formations underlying central Bucks and Montgomery Counties, on the assumption that withdrawals could be allowed up to the

annual recharge during a normal year (no discount for drought years was included). It then determined how large an area would be required for groundwater withdrawals to serve the needs identified for the water supply portion of the Point Pleasant project; the Department did not look at the future needs of existing users in the area. The Department assumed that the area wherein new wells would be developed would be restricted to its current level of groundwater withdrawal or perhaps less (Weston, Tr. 2530-31, 3444-46, 3663-64).

159. The Department also took into account DRBC's policy of avoiding overdevelopment of stressed groundwater areas in which a regional water supply system is available. This policy applies whether or not a particular well is withdrawing or would withdraw in excess of the recharge rate. The purpose of this policy is to ensure that groundwater exists not only to support the public water supply, but also to support streams and other users in the area (Weston, Tr. 3500-01).

160. Even if withdrawal of groundwater does not exceed its replacement in an average recharge year or one in ten-year recharge period, cones of depression--which are a particularly difficult problem in Triassic formations--will result. There is a likelihood that nearby domestic wells or wells located along the same fracture traces will experience drawdown problems (Weston, Tr. 3465-66).

161. Based on recharge rates, a groundwater system would have to be spread over a very large region, rendering it impractical. An added disadvantage is that a widespread system of wells would encourage further checkerboard development. (DER Exhibit 2 at 69-71; Weston, Tr. 2422-24, 2463-64, 2535-36, Runkle, Tr. 1078-80).

c. Conservation

162. Water conservation is not a viable long range alternative to the project because even during severe drought conditions, when people are most sensi-

tive to shortages and the need to conserve, a savings of only 10-15% in average total public water supply use has been achieved. Also, this rate of savings has proved not to be sustainable over a long (e.g., five-year) period. Conservation therefore will not solve the long-range Bucks-Montgomery water supply problem (DER Exhibit 2 at 68; Ford, Tr. 2205, 2265-67).

d. Lake Nockamixon

163. Lake Nockamixon was considered as an additional water supply source for Limerick (Duncan, Tr. 770). However, Lake Nockamixon was constructed for--and is dedicated to--recreational uses up to the year 2000, and may not be used for other purposes until that time (Runkle, Tr. 1010, 1022; DER Exhibit 2 at 72-73).

164. In any event, the facility would have to be redesigned and modified before it could be used for water supply purposes. Special legislative authority would be needed before water from Lake Nockamixon could be sold (DER Exhibit 2 at 73-74). Moreover, the use of Lake Nockamixon for water supply purposes would render it unavailable for emergency use in controlling the salinity front during droughts (NWRA Exhibit 7).

e. Schuylkill River

165. The question of alternative sources of cooling water for Limerick has been extensively considered by other regulatory agencies (Boyer, Tr. 3899-E). During the planning stage of this project, PECO discussed with DRBC and the Department the possible use of water from existing or proposed reservoirs on the Schuylkill and Delaware Rivers (Boyer, Tr. 3907-08). DRBC considered the use of the Schuylkill River for Limerick in its 1973 Environmental Impact Statement and 1980 Environmental Assessment, but concluded that the Schuylkill could not absorb the year-round consumptive withdrawals Limerick will require (Boyer, Tr. 3899-E; Board Exhibit 4, Part III at 2-29). In fact, the DRBC

docket expressly provides that withdrawals from the Schuylkill River itself are not permitted when the flow at Pottstown is less than 530 cfs for one unit at Limerick and 560 cfs for two units, not counting augmentation from storage developed and sponsored by the DRBC (PECO Exhibit 1 at 5; Weston, Tr. 2509).

166. A PECO request for use of an existing reservoir on the Schuylkill River (or of the Schuylkill itself) as PECO's source of cooling water for Limerick would require further regulatory approval by DRBC. In light of DRBC's extensive consideration of alternatives in its 1973 EIS and 1980 Final Environmental Assessment, and its decision declining to reconsider its previous docket orders, it is unlikely that DRBC would approve any additional use of Schuylkill water for Limerick (Boyer, Tr. 3899-D).

167. Assuming arguendo DRBC would be willing to reconsider the Schuylkill alternatives it previously rejected as infeasible, the review process would be time consuming and potentially fraught with new objectives and objectors (Boyer, Tr. 3899-D). Even if DRBC approved a Schuylkill River alternative, PECO would still have to go back to the NRC for modification of its present construction permit and, when issued, its operating license (Boyer, Tr. 3899-D).

168. The Department likewise reviewed various alternatives in the Schuylkill River Basin for one unit, and found that no existing reservoir in that basin has sufficient storage available for use as a water source for Limerick (Weston, Tr. 2367; Runkle, Tr. 858; PECO Exhibit 2, Section III at 3).

f. Blue Marsh

169. Among the several Schuylkill River alternatives examined by the Department was the Blue Marsh Reservoir, which is owned and operated by the Corps of Engineers under the guidance of the DRBC. The Department does not have regulatory jurisdiction over Blue Marsh. Its entire operation and release schedules are under the jurisdiction of DRBC. Actual operation of the facility by the

Corps of Engineers is coordinated by the DRBC. DRBC is regularly advised as to any changes in releases, which require its concurrence (Weston, Tr. 2282, 2285, 2527-28; Erickson, Tr. 1541; Runkle, Tr. 858, 1128-30). Of the storage in the reservoir, 14,620 acre-feet has been contracted to DRBC and is within its control. This is the total amount of water up to elevation 285 (Erickson, Tr. 1543, 1568, 1571). The Department would oppose the allocation of Blue Marsh water for Limerick (Weston, Tr. 3463).

170. The Blue Marsh Reservoir is authorized by federal legislation for flood control, recreation, water supply and water quality augmentation (Runkle, Tr. 1130). In furtherance of these purposes, Congress allocated 8,000 acre feet in Blue Marsh for water supply storage and 6,620 acre feet of storage for water quality augmentation (Runkle, Tr. 875, 1112-13; Weston, Tr. 2518-19). An additional 4,400 acre-feet are allocated for recreation storage (Erickson, Tr. 1543).

171. To satisfy its water supply and water quality augmentation purposes, the pool at Blue Marsh must be maintained at an elevation of 285 feet throughout the year (permanent pool). During the summer, the pool must be maintained at an elevation of 290 feet for recreational purposes, and at an initial elevation of 285 feet in the winter and spring for flood control (Erickson, Tr. 1571-72). The permanent pool is used continuously for recreation, even though it is earmarked for other purposes as well (Runkle, Tr. 1131-32).

172. Any change in the allocation of storage at Blue Marsh would require an Act of Congress, which initially authorized the allocations with reference to the report prepared by the U.S. Army Corps of Engineers (Runkle, Tr. 1092, 1131; Weston, Tr. 2519).

173. Western Berks Township has a 50-year allocation to withdraw water from the 8,000 acre feet in Blue Marsh authorized for water supply (Runkle, Tr. 1131). The required release for Western Berks Water Authority to the year 1989,

which must be made at all times, is 9 cfs (Runkle, Tr. 922). From 1990 through 1999 this release increases to 13 cfs, and from 2000 through 2009 to 18 cfs. After 2010, it is set at 27 cfs (Erickson, Tr. 1572-73). When the Western Berks allocation reaches 14 cfs, it will require about 40 percent of the 8,000 acre feet of water supply storage contained in Blue Marsh (Runkle, Tr. 1146).

174. Western Berks has top priority on the Blue Marsh Reservoir water supply storage because of its location in the Tulpehocken watershed, which feeds Blue Marsh (Runkle, Tr. 1141, 1146).

175. Water allocated to Western Berks has not been reallocated for other downstream uses, on the theory that nonconsumptive uses will return the water to the Schuylkill River. The Department has never allocated the same block of storage for two separate purposes, nor even considered return flows as an available block of storage (Runkle, Tr. 1267). The Department does not keep records, nor is there any way it could keep track of, the return flows of Western Berks (Runkle, Tr. 1272-73).

176. In addition to the Western Berks release, another 40 cfs must be continually released from the Blue Marsh Reservoir as a minimum conservation release for downstream aquatic life in the Tulpehocken Creek (Runkle, Tr. 922-23, 1160; Erickson, Tr. 1557-58). This release must pass through the dam at all times, even during low flow conditions, but it has previously been lowered during periods of drought emergency (Runkle, Tr. 1101; Erickson, 1545). The 40 cfs continuous minimum downstream release was developed by the Corps in coordination with the Commonwealth of Pennsylvania, based on the Q_{7-10} flow of Tulpehocken Creek as reflected in the State Water Plan (Erickson, Tr. 1552-55). A Q_{7-10} flow is a low daily flow computed from a seven consecutive day flow which is so far below average that its expected recurrence interval is ten years (Erickson, Tr. 1554-55). Section 105.113(b)(1) of the Department's regulations states a

formula specifying the amount of water (in cfs per square mile of the drainage area of a dam structure) which must be released as a minimum conservation measure to protect aquatic life downstream (Runkle, Tr. 1102-03, 1105-06, 1111-13).

177. While the Department is consulted by DRBC with respect to changes in the conservation release, the Department does not have authority to approve or disapprove the change (Weston, Tr. 2527-28).

178. In addition to the Western Berks usage, the water supply storage in Blue Marsh has been utilized for emergency drawoffs during drought, e.g., in the 1980-81 drought, to control salinity in the Delaware Estuary (Runkle, Tr. 1132).

179. In 1977, Blue Marsh was considered as a source of supply for two units at Limerick, as part of the State Water Plan (Runkle, Tr. 861, 1133, 1137). The Department also evaluated the possibility of using the Blue Marsh Reservoir to provide the makeup cooling water for one unit at Limerick in response to the general suggestions expressed by Del-Aware (PECO Exhibit 6 at 12; Runkle, Tr. 861-62, 1130-31, 1221; Weston, Tr. 2367).

180. The State Water Plan staff found that it would take five times the amount of water supply storage in Blue Marsh to sustain the 530 cfs flow in the Schuylkill River one unit at Limerick would have to withdraw from the river during the second and eighth worst years of record (Runkle, Tr. 914-15, 1120). This calculation did not include flows into the Blue Marsh Reservoir because evaporation, minimum downstream releases and the Western Berks Water Authority allocation would use up the total inflow coming into the Reservoir (Runkle, Tr. 915). Additionally, this determination was based on a 27 cfs average use figure for one unit and did not make allowances for peak use (Runkle, Tr. 938).

181. The Department determined that flows from the Schuylkill and natural flows of the Perkiomen Creek would provide sufficient water for Limerick

only 60 percent of the time, and that the remaining 40 percent, i.e., for 146 days, per year, would be supplied from the Point Pleasant diversion (DER Exhibit 2 at 28; Runkle, Tr. 1152-57).

182. One cfs-day is equal to 2 acre-feet (Runkle, Tr. 1151). Therefore, utilizing the flow value for one unit at Limerick of 32 cfs times 146 days yields 4,672 cfs-days, or 9,344 acre-feet of water storage necessary to meet the demands for even a single unit at Limerick (Runkle, Tr. 1153). The figure would be double for two units (Runkle, Tr. 1154).

183. If one ignores the minimum flow requirements (of 530 cfs and 560 cfs) imposed by the DRBC for withdrawals for Limerick on the Schuylkill, flows available from the storage capacity at Blue Marsh would not, during the second worst drought year of record, provide sufficient yield to meet the demands for one unit at Limerick at less than peak demand. The 4,000 cfs available from the 8,000 acre-feet water supply storage component of Blue Marsh would just barely be enough to meet the average use at Limerick during such a drought period (Runkle, Tr. 964). Blue Marsh would have capacity for one unit at Limerick even during drought periods if a portion of the block of storage of 6,620 acre-feet which has been dedicated for low flow water quality were used.

184. Although the definition of an interbasin or interwatershed transfer varies, the transfer of water at Point Pleasant from the Delaware River to the Neshaminy and Perkiomen Creeks (both tributary to the Delaware) does not constitute an interbasin transfer for purposes of the proposed Water Resources Management Code or water management in the Commonwealth (Weston, Tr. 3648-49); transfer from the Delaware to the Schuylkill is an interbasin transfer which, pursuant to DER policy, requires that the Schuylkill's resources have been thoroughly utilized.

185. Since the Schuylkill sub-basin is very heavily allocated, all plans for future water uses in the area rely solely upon Blue Marsh inasmuch as there are no other storage projects being planned by DRBC on the Schuylkill at this time (Weston, Tr. 2661-62). Thus, the only supply available in the future for public water suppliers and private users in that sub-basin is the remainder of the Blue Marsh water supply storage (60 percent) left after the Western Berks allocation (Runkle, Tr. 1170; Weston, Tr. 2660-61).

186. Dedication of Blue Marsh to Limerick means, as a practical matter, that all other area users would be restricted to their current allocations with no capacity for expansion (Weston, Tr. 2661; Runkle, Tr. 1224). This would conflict with anticipated needs of public water suppliers for Philadelphia, Pottstown, Phoenixville and Norristown for additional withdrawals from the Schuylkill River (Runkle, Tr. 1169).

187. Aside from future allocations, allowing withdrawals from Blue Marsh for even one unit at Limerick would have an impact upon downstream Schuylkill River users. The distance between Blue Marsh and Limerick is one of the most heavily used stretches of the most heavily used rivers in the Commonwealth. There are a number of industrial and municipal intakes between Philadelphia and Limerick. These users would be deprived of any consumptive water use allowed for Limerick from Blue Marsh. For example, 21 mgd for one unit at Limerick is roughly equivalent to 13 percent of the Q_{7-10} flow of the Schuylkill at the Pottstown gauge; the Q_{7-10} flow is the flow standard customarily used during investigations concerning water quality at low flow. Accordingly, diminishing the flow of the Schuylkill by 21 mgd below Limerick would subtract a substantial amount of the low flow, would impact users along the River, and would also affect instream uses of the River, including wasteload assimilation (PECO Exhibit 6 at 16-18; Weston, Tr. 2669-70).

188. The Department therefore again concluded--in the context of these appeals--that Blue Marsh is not a viable alternative to the Point Pleasant pumping project for even one unit at Limerick, because of anticipated needs for population growth and industrial expansion within the Delaware River Basin (PECO Exhibit 6 at 16-18; Runkle, Tr. 1162).

189. Even if there were sufficient water in Blue Marsh for one unit at Limerick, DRBC would have to approve PECO's use of that water (Boyer, Tr. 3910-11). The Department does not have jurisdiction over non-potable supplies of water allocation, just public water supplies. Any industrial water allocation would therefore have to come from DRBC (Runkle, Tr. 976).

190. Allowing PECO to utilize water from Blue Marsh, to provide makeup cooling water for one unit at Limerick and to provide compensatory releases at low flow periods from Merrill Creek into the Delaware River, would not satisfy the conditions of PECO's docket at the DRBC (regarding Schuylkill flows) (Weston, Tr. 2372-74). PECO's allocation from DRBC is conditioned such that it may not withdraw from the Schuylkill River when the flow at Pottstown, not including flow from any DRBC sponsored storage, falls below 530 cfs (Weston, Tr. 2374).

191. Interpreting the DRBC docket decisions relevant to withdrawal of Schuylkill River water by PECO for Limerick, the Associate Deputy Secretary for Resources Management, who is also the Alternative Delegate for the Commonwealth of Pennsylvania to DRBC, concluded that DRBC probably would not allow Blue Marsh to be used for Limerick under those decisions (PECO Exhibit 6 at 18; Weston, Tr. 2380). Significantly, the Alternative Delegate stated that the Department and the Pennsylvania DRBC Commissioner would not support a commitment to a single user of a reservoir meant for an entire basin with 1.5 million people (Weston, Tr. 3463).

g. Philadelphia Suburban

192. The availability of water from Philadelphia Suburban Water Company for Limerick was investigated in the State Water Plan (Runkle, Tr. 1141). Philadelphia Suburban Water Company reservoirs have a combined 96.5 mgd yield. They are currently supplying 77.5 mgd and have a 17 mgd surplus (Runkle, Tr. 981-83). The frequency on which this yield figure is based is unknown. Therefore, Philadelphia Suburban may not actually have a surplus during droughts (Runkle, Tr. 984).

193. It is projected that Philadelphia Surburban will require 107.7 mgd by 1990 and 148.1 mgd by 2020 (Runkle, Tr. 1142). Even with the utilization of the Green Lane Reservoir, its four other reservoirs and its existing wells, Philadelphia Suburban faces a yield deficiency of 13.5 mgd in 1990 and 54 mgd in 2020. Thus it is not a long-term source of water for Limerick (Runkle, Tr. 1142-43, 1166-67).

h. City of Philadelphia

194. The Department also considered reducing the City of Philadelphia's allocation and having PECO take this water out at Pottstown, but rejected this alternative because of the nature of the use. One unit at Limerick requires a consumptive water use in excess of 21 mgd. The City of Philadelphia's use of its water is primarily nonconsumptive. Only ten percent is consumed; the remainder is return flow. Also, the stretch of the Schuylkill between Pottstown and Philadelphia contains a number of industrial and municipal intakes, and is one of the most heavily used reaches in the Commonwealth. Those users would be deprived of water consumed at Limerick. The loss of this water would have a substantial impact on aquatic life, recreation, users along the river and the instream uses of the river, including waste load assimilation (PECO Exhibit 6 at 6-12; Weston, Tr. 2669-70).

i. Pipeline from Philadelphia

195. The Department also considered diverting the Delaware River water at Philadelphia rather than at Point Pleasant as an alternative to the project. This alternative would only provide cooling water for Limerick. It determined that a 30-mile pipeline with pumpage over an elevation differential of 450 feet would be necessary. Installation of this pipeline, three times the combined length of the Point Pleasant combined transmission main and Perkiomen transmission main, would entail intensive construction activities through heavily populated areas at a cost exceeding 52 million dollars. It was also determined that maintenance and repair would be more difficult, and that operational costs for transmitting the water over a greater distance would necessarily be substantially higher. It was also determined that this alternative would not be environmentally preferable, particularly as regards Delaware River flow and salinity intrusion (DER Exhibit 2 at 79-80).

196. Detailed discussion of the alternatives discussed for the NWRA portion of the project is set forth in the Discussion, infra, and incorporated herein by reference. In sum, none of the proposed alternatives were demonstrated by the appellants to be feasible, let alone superior to the Point Pleasant project.

J. Permitting Process

197. Peter Duncan was the Secretary of the Department in 1981-82. In that capacity, he was ultimately responsible for the determination that an Environmental Assessment should be prepared for the Point Pleasant project (Duncan, Tr. 748-49). On the basis of his belief that a single focus was needed to pull all the necessary information together, Duncan assigned Timothy Weston to oversee the actual preparation of the Assessment (PECO Exhibit 6 at 2; Duncan, Tr. 751-52). Duncan assigned Weston lead responsibility for the Environmental Assessment in view of his managerial experience and background in the Department, particularly in the Division of Water Quality Management (Duncan, Tr. 751-52).

198. Duncan instructed William Middendorf, Deputy Secretary of Environmental Protection, to provide Weston with the necessary water quality information (Duncan, Tr. 752). In return, Middendorf delegated responsibility for coordination with Weston to Leon Gonshor, Director of the Southeastern Regional Environmental Protection Office, and Louis Bercheni, Director of the Bureau of Water Quality Management (Middendorf, Tr. 794).

199. Jack Ford, Chief, Eastern Section, Division of Waterways and Stormwater Management, was in charge of compiling the material for the Environmental Assessment (Rehm, Tr. 1675). As such, he drafted many of the initial sections and prepared the final sections dealing with water conservation and wetlands (Ford, Tr. 2140, 2202; Weston, Tr. 2430). Other sections were supplied by Steve Runkle, a hydraulic engineering supervisor with the State Water Plan, and John McSparran, Director of the Water Resources Management Bureau (Runkle, Tr. 822-25; Ford, Tr. 1981-84; Weston Tr. 2430).

200. In preparing the Environmental Assessment, the Department cross-checked the information supplied with the applications against information already in the Department (Ford, Tr. 1929, 2106-08).

201. As permit coordinator, Weston's duties were to coordinate the activities of an interdisciplinary staff involving professionals from a number of DER bureaus and offices (PECO Exhibit 6 at 2).

202. In conducting its review of the Point Pleasant project, the Department examined and (to some extent) relied upon numerous reviews, studies and analyses performed by DRBC, the Corps of Engineers and the Soil Conservation Service of the U.S. Department of Agriculture. In addition to the several environmental assessments and environmental impact statements prepared by these agencies, the Department also reviewed and relied upon voluminous documents, studies, reports and comments furnished by PECO and NWRA, as well as by other individuals

and organizations commenting on the project (DER Exhibit 2 at 14-23; Ford, Tr. 2195; Weston, Tr. 2327).

203. With regard to the instant appeal, the Department reviewed a number of reports and other forms of correspondence furnished by appellants and other opponents to the project (DER Exhibit 2 at A-13 to A-15; Stipulation, Tr. 213; see Del-Aware Exhibits 4-17).

204. The Department was also guided by the decision of the United States District Court for the Eastern District of Pennsylvania, affirming DRBC's previous approvals of the project in *Delaware Water Emergency Group v. Hansler*, 536 F. Supp. 26 (E.D. Pa. 1981), aff'd, 681 F.2d 805 (3d Cir. 1982) (DER Exhibit 2 at 21-22).

205. The Department reviewed DRBC's addition of the Limerick component of the Point Pleasant project to the Comprehensive Plan, as set forth in DRBC Docket Nos. D-69-210 CP (March 29, 1973) (PECO Exhibit 1), D-69-210 CP (Final) (November 5, 1975) and in DRBC Docket No. D-79-52 CP (February 18, 1981) (PECO Exhibit 11). In this regard, the Department studied DRBC's Final Environmental Impact Statement on the Point Pleasant Diversion Plan (1973) and its Final Environmental Assessment for the Neshaminy Water Supply System (August 1980), which accompanied these approvals (DER Exhibit 2 at 17, 21, 28).

206. The Department also reviewed the record before the AEC (which resulted in the issuance of the Final Environmental Statement (November 1973) related to Limerick), as well as the hearing record before the Atomic Safety and Licensing Board and the Appeal Board of the AEC on the issuance of construction permits for Limerick in *Philadelphia Electric Company* (Limerick Generating Station, Units 1 and 2), LBP-74-44, 7 AEC 1098 (1974), aff'd ALAB-262, 1 NRC 163 (1975), aff'd sub nom. *Environmental Coalition of Nuclear Power, et al. v. Nuclear Regulatory Commission, et al.*, No. 75-1421 (November 12, 1975) (DER Exhibit 2 at 18, 19, 28).

207. The Environmental Assessment was the primary decision document for all the permits on appeal issued by the Department. The entire impact of the project was considered in connection with the issuance of each permit (Weston, Tr. 2298, 2484, 2489).

208. The Environmental Assessment prepared for the Point Pleasant project is the first Assessment completed for the issuance of dam and encroachment permits under Chapter 105 of the Department's regulations (Ford, Tr. 2200-01). Prior to the fall of 1982, environmental assessments were done on short form letters with information supplied by the various Commonwealth agencies and departments (Ford, Tr. 2202).

209. On April 14, 1982, Department officials met with Del-Aware representatives and technical assistants for an entire day. The purpose of the meeting was not to solicit the views of state agencies, whose opinions had otherwise been sought through routine channels, but rather to ensure that the draft Environmental Assessment would fully address Del-Aware's concerns (Ford, Tr. 1924; Sigstedt, Tr. 216-17, 230-31; Weston, Tr. 2339, 2342-43).

210. At the April 14, 1982 meeting, Del-Aware submitted a compilation of written objections to the Point Pleasant project as well as 13 documents setting out its position on the issues (Del-Aware Exhibit 18; Sigstedt, Tr. 215; Stipulation, Tr. 212-13).

211. Various Department officials attended the April 14, 1982 meeting and noted the issues within their cognizance as discussed by Del-Aware's members. Their responses to Del-Aware's comments were then provided to Ford, as the primary compiler of the Environmental Assessment (Ford, Tr. 1935-36).

212. Del-Aware's representatives met with Department personnel with regard to the project on a number of other occasions, including one occasion in which Mr. Weston met with state legislators from the Point Pleasant area, their

SUGARMAN, DENWORTH & HELLEGERS

ATTORNEYS AT LAW

ROBERT J. SUGARMAN
JOANNE R. DENWORTH
JOHN F. HELLEGERS

ROBIN T. LOCKE

16TH FLOOR, CENTER PLAZA
101 NORTH BROAD STREET
PHILADELPHIA, PENNSYLVANIA 19107
(215) 751-9733

SUITE 835
1201 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, D.C. 20004
(202) 737-4460

ROBERT RAYMOND ELLIOTT, P.C.*
COUNSEL

*NOT ADMITTED IN PA.

May 23, 1984

Mr. Harold Denton
Director Nuclear Regulation
Nuclear Regulatory Commission

Re: Del-AWARE 2.206 Petition

Dear Mr. Denton:

Enclosed please find a copy of my letter of today to Ann Hodgdon of the NRC staff.

The comments in this letter are equally pertinent to your action of Del-AWARE 2.206 Petition, and I respectfully request that you imemdiately modify and reopen your decision in that petition and advise PECo of the need to supplement its application to provide alternative sources of supplemental cooling water, and establish procedures to deal with such amended application.

This is also request that you promptly inform the Commission, which has your decision on the 2.206 Petition under advisement, regarding your action, and the necessity for reopening the 2.206 Petition under advisement, regarding your action, and the necessity for reopening the 2.206 Petition, as well as supplementing the staff briefing.

Since the staff has been so repeatedly apprised of the conditions, it is incredible that the staff could completely misstate the situation to the Commission. I request copies of all staff papers relating to this briefing to this Commission, insofar as they concern Limerick and/or the supplemental cooling water for Limerick.

In its denial of the Petition under §2.206 on April 25, as well as in its staff letter of April 25, and the Board decision of April 23, the NRC staff contends that if and when an application is made by PECo which reflects use of a different sources of supplemental cooling water, such amended application would be reviewed in the same manner as the original application, proposing use of Point Pleasant.

Obviously such review will take some amount of time. Action by the staff to commence such review even if it is arguably a contingency at this point, is not only a matter within the control of the Commission, but also directly relevent to the Commission's expressed concern for avoidance of delays. Indeed, differing consideration of alternatives, even though they might exist in the real world, is precisely the purest case of licensing delay unrelated to progress of contruction. It is as directly violative of the Commission's expressed policy as any possible action could be.

That this is not merely a theoretical or speculative problem is highlight by the staff's report to the Commission that the applicant seeks low power operation in 1984, while Point Pleasant could not be available, even if recommenced promptly, prior to spring 1985.

In these circumstances, the staff's refusal to undertake evaluation of alternatives at this time, in order to prevent delays in the operation of Limerick, is arbitrary and capricious in the classic sense, as well as a bias application of Commission's policies.

If not in fact designed to defer action until the point where PECo can make the claim in local court that the NRC cannot process alternatives fast enought to avoid delay, it certainly is determined upon with full knowledge of that potential effect.

In view of the seriousness of this matter, it urgency, and the staffs inconsistent statements, I am taking the liberty of bringing this letter to the attention of the Commissioners and Chairman Bevill.

Sincerely,

Robert J. Sugarman

/vc
Enclosure

constituents and opponents of the project to discuss their concerns (Sigstedt, Tr. 217; Greenwood, Tr. 259).

213. Additionally, Representative Greenwood met with Mr. Runkle in the summer of 1982, to review Schuylkill flows and the need for Delaware River water as a make-up source of cooling water for Limerick (Greenwood, Tr. 261-62). State Representative Greenwood and Del-Aware's President, Colleen Wells, subsequently reviewed this matter with Mr. Weston at a meeting on July 19, 1982 (Greenwood, Tr. 268). Mr. Greenwood and Miss Wells discussed several concerns at this meeting, regarding Merrill Creek and the PUC decision on Unit 2 of Limerick. They also discussed the Blue Marsh Reservoir as an alternative to using Delaware River water, and raised various other issues (Greenwood, Tr. 270-72, 276, 297).

214. Another meeting, held on August 17, 1982, was attended by Secretary Duncan, State Representative Greenwood, Del-Aware's legal counsel and another Del-Aware representative on these same subjects. They also discussed the potential use of Lake Nockamixon as a supplemental flow augmentation source. Secretary Duncan agreed to consider the points raised at the meeting (Greenwood, Tr. 276-77, 281).

K. North Branch Flows

215. While the additional pumpages into the North Branch Neshaminy Creek may exceed the median flows at the point of discharge, they are minor in comparison to the flows exhibited during storm events occurring every few years (testimony of Dr. Dresnack, Tr. 4370).

216. Based on Dr. Dresnack's independent analysis of the North Branch Neshaminy Creek, the 1970 calculations prepared by E. H. Bourquard are reasonable and accurate (testimony of Dr. Dresnack, Tr. 4481-85; DER Exhibit 2, Table 3; NWRA Exhibit 55 and 56).

217. Flows in the North Branch Neshaminy Creek, after the initiation of pumpages from the Bradshaw Reservoir, will be confirmed to the stream bed and will not cause overbanking (testimony of Dr. Dresnack, Tr. 4345-4349).

218. The ratio of peak flows to long-term-average flows is primarily a function of drainage area: as drainage area increases, the ratio decreases. As a result, a mean annual flood of 280 cfs at the North Branch Neshaminy Creek is considered reasonable since the drainage area is only two square miles (NWRA Exhibit 52, Testimony of Dr. Dresnack, Tr. 4364-69).

219. Using a worst-case scenario (no natural flow in the North Branch Neshaminy Creek), there will be ample in-bank capacity in the North Branch Neshaminy Creek to accommodate a maximum daily discharge of 48.8 mgd in the year 2010 (NWRA Exhibits 53 and 54; testimony of Dr. Dresnack, Tr. 4377-84).

220. Depth changes of no more than 1.5 feet above natural conditions will occur in the North Branch Neshaminy Creek (testimony of Dr. Dresnack, Tr. 4345-49).

221. Findings of Fact 86 and 87 *supra* mean that for a bare stream channel composed of silty clay loam and sandy clay loam, a non-erosive diversion velocity is 2 fps or less (testimony of Dr. Dresnack, Tr. 4371-72; NWRA Exhibit 57); the corresponding figure for water transporting colloidal silt in a firm loam channel is 3.5 fps (testimony of Dr. Dresnack, Tr. 4372; PECO Exhibit 12).

222. Using the maximum daily discharge of 48.8 mgd in the year 2010, the diverted water will exit the North Branch Transmission Main at a velocity of 7.85 fps. However, the proposed energy dissipator will reduce the flow velocity and the water diverted will enter the North Branch Neshaminy Creek channel at only 1.2 fps (NWRA Exhibits 31 and 55, testimony of Dr. Dresnack, Tr. 4348-92). In the year 2010, when conveying the average daily flow of 32.6 mgd through the North Branch Neshaminy Creek, the flow velocity in the channel will be 2.2 fps and the stream depth will be 1.2 feet (testimony of Dr. Dresnack, Tr. 4392-93).

223. The mean velocity in the North Branch Neshaminy Creek after the initiation of pumpages from the Bradshaw Reservoir will be 1 fps; maximum velocity will be 2.5 fps (testimony of Dr. Dresnack, Tr. 4345-49).

224. Impacts to the North Branch Neshaminy Creek will be minimal because pumpages from the Delaware River will be implemented gradually during a 25 to 30-year time span. There will not be a zero-to-maximum increase on a daily or weekly basis, and monitoring in the early stages will help to establish flow requirements needed for particular water demand (testimony of Dr. Dresnack, Tr. 4395-96).

225. To assure proper operation of the releases from the Bradshaw Reservoir to the North Branch Neshaminy Creek, NWRA's operating plan requires 24 hour, 7 days per week monitoring of stream flows and weather conditions. NWRA will not continue pumping during flood conditions (testimony of Dr. Dresnack, Tr. 4492-4493; DER Exhibit 2, p. 40).

226. The amount of flow in the North Branch Neshaminy Creek will be based on the daily water supply needs and on the desired storage and recreational water level in Lake Galena (NWRA Exhibit 13, testimony of Dr. Dresnack, Tr. 4423-24, 4427).

227. The refilling of Lake Galena for summer recreational use will commence in December or January of each year. If natural inflows from North Branch Neshaminy Creek to Lake Galena are considered inadequate, those inflows will be supplemented by diversions from the Delaware River. A plan of operation will establish Bradshaw Reservoir pumpage rates, based on Lake Galena recreational and storage needs and on drought considerations affecting the North Branch Neshaminy Creek (testimony of Dr. Dresnack, Tr. 4444-46; DER Exhibit 2, p. 10).

228. Although DER determined that the diversion of water into the receiving stream, North Branch Neshaminy Creek, would have no adverse erosive

impacts, DER conditioned the permit issuance on permittee's continuous monitoring for erosion in the receiving stream (testimony of Jackie Ford, Tr. 1962; Dams and Encroachments Permit ENC 09-81, Special Condition "V").

229. A seine sampling survey of the North Branch Neshaminy Creek, performed by NWRA's consulting biologist on April 17, 1983, found a very diverse fish community, typical of small temperate streams in the Mid-Atlantic region (testimony of Harold M. Brundage, Tr. 3853-54).

230. The North Branch Neshaminy Creek fish species are very similar in composition and relative abundance to those found in the Delaware River near Point Pleasant; but the Delaware River also has large game species (American Shad, Blueback Herring) not found in the North Branch Neshaminy Creek, because the Delaware has a larger volume of water and more niches for fish to occupy (testimony of Harold M. Brundage, Tr. 3855-56).

231. The North Branch Neshaminy is an intermittent stream, having dry reaches and small stagnant pools in the summer. The Delaware River pumpages would increase the fish habitat (testimony of Harold M. Brundage, Tr. 3863-64; testimony of Stephen Runkle, Tr. 856-57).

232. Aquatic life in the North Branch Neshaminy Creek currently experiences considerable changes in flow and sediment, due to flash rainfalls (testimony of Harold M. Brundage, Tr. 3855-57).

233. The water quality Chapter 93 standards applicable to the North Branch are identical to those in the East Branch; thus the Findings above regarding water quality impacts on the East Branch (Findings of Fact 103-113) are incorporated herein as though set forth at length.

III. DISCUSSION

A. PREAMBLE

As the reader has already discerned, having waded through or skimmed over the more than two hundred findings of fact, this has been a complex and hotly contested case. In order to get a handle on the lamentably extensive discussion to follow, the first order of business is to describe: (1) the Point Pleasant project, and (2) the actions of DER regarding that project which gave rise to the appeals at the above docket.

1. Project Description--General

The description of the project which immediately follows this paragraph is from DER Exhibit 2, a document entitled Environmental Assessment Report and Findings Point Pleasant Water Supply Project, dated August 1982. It is appropriate to quote the Environmental Assessment because this document summarizes the Department's reasoning for taking each of the presently appealed actions, while simultaneously addressing each of the environmental issues raised by the appellants. This is not a coincidence; the appellants in this case, a citizens group known collectively as Del-Aware Unlimited, Inc., have been involved in DER's decision-making process to an unusal degree. Representatives of appellants participated in an April 14, 1982 scoping meeting with top-level DER personnel; during this meeting, and throughout dozens of other contacts with DER officials, appellants helped DER construct the list of environmental issues to be considered. To some extent the Environmental Assessment can be considered the Department's answer to appellants' concerns.

> The proposed Point Pleasant Project is an integral component of the Neshaminy Water Supply System that is being implemented by the Neshaminy Water Resources Authority of Bucks County. This system would divert water from the Delaware River mainstem at Point Pleasant to (1) supplement public water supplies in Bucks and Montgomery Counties, and (2) provide water, when needed, to the Limerick Nuclear Generating Station in Montgomery County.

The Point Pleasant Pump Station would have an ultimate capacity to divert 95 million gallons per day (mgd) and lift water via a transmission main some 2.4 miles to the proposed Bradshaw Reservoir. The Bradshaw Reservoir would serve as a holding and control structure. This first segment, from the Point Pleasant Pump Station to the Bradshaw Reservoir and Pump Station, would serve as a joint facility for Philadelphia Electric Company (PECO) and Neshaminy Water Resources Authority (NWRA). It would be developed and operated by the NWRA on behalf of both project sponsors.

In the second segment, the water diverted from Bradshaw Reservoir to the Neshaminy Water Resources Authority water supply system would be released into a transmission main approximately one mile long to the North Branch Neshaminy Creek, and then [would] flow by gravity into and through Lake Galena to the North Branch water treatment plant located in Chalfont, Pennsylvania. After appropriate treatment to meet Federal and State drinking water standards, finished water would be distributed through several transmission mains to serve retail public water supply systems in Bucks and Montgomery Counties serving over 50 municipalities. These transmission facilities would be constructed and operated by NWRA.

The maximum amount of water to be pumped from the Delaware River at Point Pleasant through Bradshaw Reservoir in the year 2010 for public water supply would be 49 mgd. Forty mgd ultimately would be picked up at the Chalfont Water Treatment Plant. Approximately 4 mgd would constitute evaporative and seepage losses, and 5 mgd would serve as stream flow augmentation in the Neshaminy Creek to enhance fish and wildlife, in accordance with release schedules requested by the Pennsylvania Fish Commission and imposed as conditions in the Water Allocation Permit No. WA-0978601 previously issued for the project by the Department of Environmental Resources.

The Chalfont Treatment Plant would be built in two phases. The first, with 20 mgd capacity, would serve immediate water supply needs. A second phase of 20 mgd would be added between 1990 and 2000, as projected demand requires.

In the third segment, a maximum of 46 mgd would be pumped from the Bradshaw Reservoir via a transmission main some 6.7 miles to the East Branch Perkiomen Creek. Water released to the upper reaches of the East Branch Perkiomen Creek would flow by gravity in the stream channel [some 22 miles] to a diversion point near Graterford on the Perkiomen Creek, and hence via a transmission main to the Limerick Nuclear Generating

Station. This segment, including [the] Bradshaw Reservoir, transfer facilities to Perkiomen Creek, and pumping facilities from Perkiomen Creek to Limerick, would be developed and operated by the Philadelphia Electric Company. (Reference should be made to Figure No. II-1 a schematic of the project also from the Environmental Assessment which follows this page.)

A. Point Pleasant Pump Station

The project site is located on the west bank of the Delaware River at a point near the southern limits of the Village of Point Pleasant in Plumstead Township, Bucks County, Pennsylvania. As noted in material supplied by E.H. Bourquard Associates, Inc., and in the plans associated with Application No. 09-81, the station will be approximately 80 feet long by 45 feet wide [by at least 15 feet] above finished grade and is to be a reinforced concrete structure with architectural features...[causing it to]...resemble a barn. The station will house pumps having a total capacity of 95 mgd (147 cfs), together with related heating and ventilating, electrical, and instrumentation and control facilities. (The station will be visible from the Delaware Canal a/k/a Roosevelt State Park.)

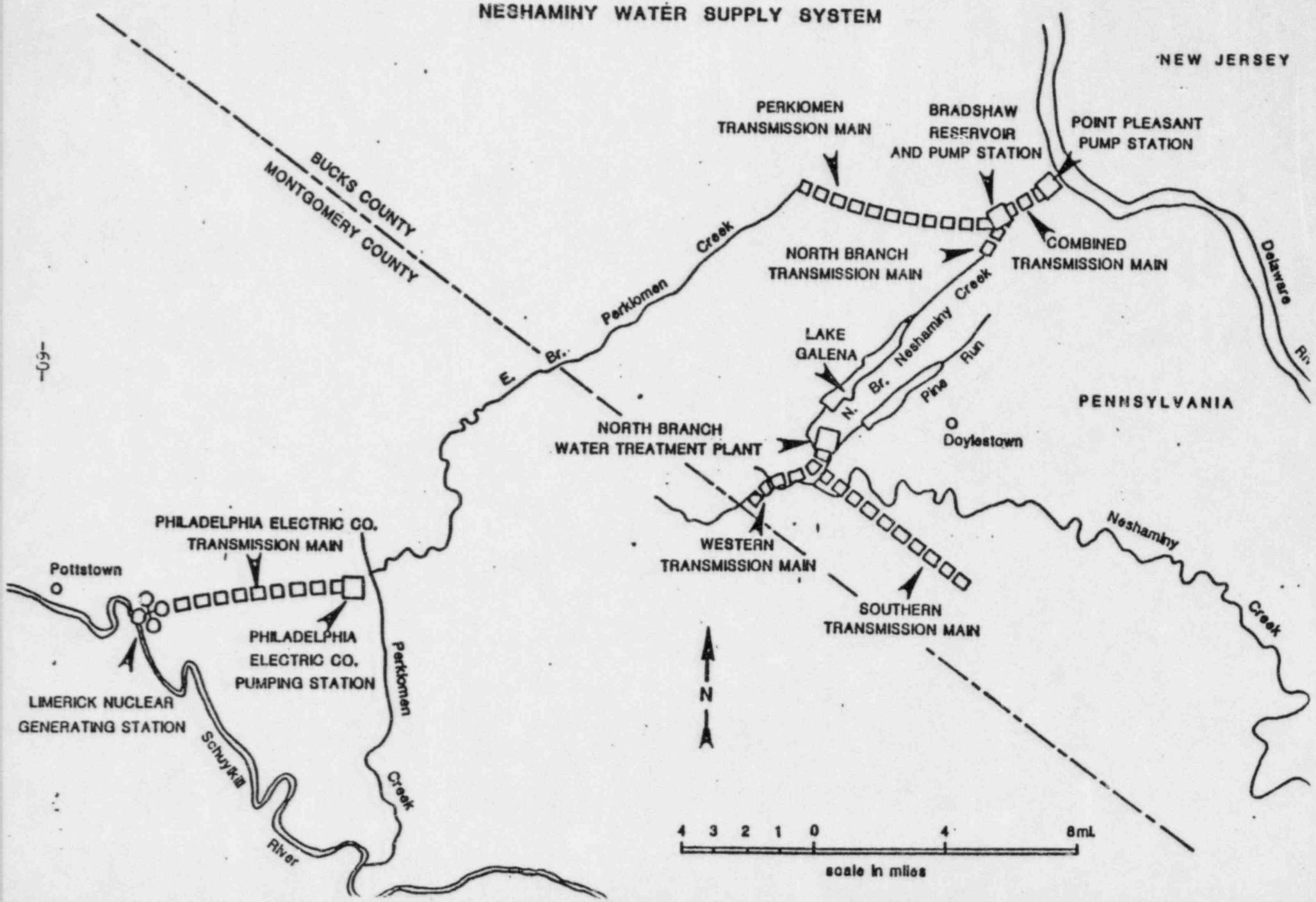
The intake for the pump station is to consist of an assembly of wedge wire screens which will be located at a point approximately 245 feet streamward of the bank and which will have an approximate minimum submergence of 4 feet during low flow stages in the river. A total of twenty-four (24) screens will be installed in three groups of eight screens each. The screens will be 40 inches in diameter and maximum flow velocities through the screen slots will be approximately 0.5 feet per second. The screens will be cleaned by both hydraulic and air wash systems.

Each group of screens is to be connected by a 42 inch diameter reinforced concrete pipe to a gate well to be located along the shore line. From the gate well, a 72-inch diameter reinforced concrete pipe will pass under the Delaware Canal (Roosevelt State Park) carrying water from the well to the pump station.

B. Combined Transmission Main

The combined transmission main will deliver flow from the pump station to Bradshaw Reservoir and will extend through a reach of approximately 2.4 miles. Based on the use of reinforced concrete pipe, the first 1600 feet of main that will traverse the steep river valley slopes will be 66 inches in diameter with the remainder being a 60 inch diameter pipe.

Figure No. II-1



C. Bradshaw Reservoir

The Bradshaw Reservoir (Application No. D09-181) will serve as the point of discharge for the water pumped through the combined transmission main. The reservoir will be structured on the drainage divide between the North Branch Neshaminy Creek and the South Branch Geddes Run. The embankment will consist of compacted earthern dikes formed from material excavated at the site. These dikes will vary in height from 5 feet to 23 feet and will form a square reservoir about 900 feet on a side. Operating capacity of the reservoir will be approximately 70 million gallons (215 acre-feet). The reservoir will have no drainage area feeding it except for the actual water surface of 18.8 acres.

D. North Branch Transmission Main

The North Branch Transmission Main will deliver a maximum of 49 mgd by gravity flow from Bradshaw Reservoir to the upper reaches of the North Branch Neshaminy Creek, from which point the flow will be via the stream approximately 4 miles to Lake Galena and then on to the North Branch treatment plant. The main is to be a 42 inch diameter pipe based on the use of reinforced concrete pipe and will be approximately one mile in length. At the point of discharge on the North Branch, an energy dissipator and riprapped channel are to be installed to reduce flow velocities and guard against erosion as the flow is discharged into the stream. The maximum flow added to the channel will be 49 mgd or 76 cfs.

E. Perkiomen Transmission Main

The Perkiomen Transmission Main which connects Bradshaw Reservoir with the East Branch Perkiomen Creek will convey water via a 42 inch diameter pipe a distance of approximately 6.7 miles along an existing gas pipeline right-of-way to the upper reaches of the East Branch Perkiomen Creek. At the point of discharge, an energy dissipator would be constructed to reduce erosion of the stream bed and stream banks. A small connecting spur channel dug perpendicular to the stream channel is also included in the energy dissipator design. The water would travel 22.2 stream miles via open channel conveyance to be picked up via withdrawal facilities located near Graterford, Pennsylvania, for eventual use at the Limerick Nuclear Generating Plant.

F. Operating Plan

This assignment is based on plans of operation for the various elements of the Point Pleasant project as outlined in the applications and in conditions imposed on project

operations by regulatory decisions and permits issued by the Delaware River Basin Commission, the Department and the Army Corps of Engineers.

Public Water Supply Operations

Public Water supply withdrawals for the Neshaminy Water Supply System involve a sequence of diversions from a series of sources. The withdrawal plan approved by the Department as part of the Water Allocation Permit No. WA-0978601 involves the following order of operations, as needed, to serve public water supply demands in the service area:

(1) Withdrawals from the natural flow of Pine Run, up to 10 mgd (subject to minimum flow requirements in the North Branch Neshaminy Creek below the Chalfont Treatment Plant, described below).

(2) Withdrawals from the natural flows of the North Branch Neshaminy Creek, up to 15 mgd (subject to minimum flow requirements in the North Branch Neshaminy Creek below the Chalfont Treatment Plant, described below).

(3) Withdrawals from releases to the North Branch Neshaminy Creek from storage in Lake Galena (subject to the Lake Galena operating plan, described below).

(4) Withdrawals from the Delaware River up to 49.8 mgd (subject to conditions imposed in DRBC Docket No. D-65-76 CP(8).

The total withdrawal of Chalfont, from natural or augmented flows, may not exceed 40 mgd. These withdrawals are conditioned upon maintaining a continuous minimum flow in the North Branch Neshaminy Creek below the Chalfont Treatment Plant of 5.3 mgd from March 1 to June 15 of each year, and 2.73 mgd from June 16 through February.

Cooling Water Operations

Withdrawals to serve consumptive cooling water requirements at the Limerick Nuclear Generating Station similarly involve a sequence of diversions. The average rates of consumptive use for cooling are 17.5 mgd for one power plant unit operating, and 35 mgd for two units. Maximum consumptive use rates are 21.3 mgd for one unit operating, and 42 mgd for two units.

Depending on actual cooling water demand at Limerick (based on electric generating demand and several technical factors), withdrawals will be made in the following order:

SUGARMAN, DENWORTH & HELLEGERS

ATTORNEYS AT LAW

ROBERT J. SUGARMAN
JOANNE R. DENWORTH
JOHN F. HELLEGERS

ROBIN T. LOCKE

16TH FLOOR, CENTER PLAZA
101 NORTH BROAD STREET
PHILADELPHIA, PENNSYLVANIA 19107
(215) 751-9733

SUITE 835
1201 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, D. C. 20004
(202) 737-4460

ROBERT RAYMOND ELLIOTT, P. C.*
COUNSEL

*NOT ADMITTED IN PA.

July 13, 1984

Mr. Harold Denton
Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Denton:

In light of your response to my letter of May 23, 1984, I would like to have you treat that letter and this letter as a new petition under 10 CFR 2.206. Accordingly, I request that you consider my May 23, 1984 letter, as a 2.206 petition, which this letter will supplement.

On June 18, 1984, the Pennsylvania Environmental Hearing Board held that the PECo discharge into the East Branch Perkiomen Creek would require compliance with water quality standards. Bucks County's engineers have determined that this would require a sewage treatment plant in order to remove the heavy metals contained in the Delaware River water, and other pollutants, and that the timeframe to provide such a system would be three to five years.

On June 22, 1984, the Pennsylvania PUC indefinitely postponed a decision on PECo's request for permission to build the Bradshaw Reservoir and pump station, a necessary portion of the proposed diversion, because of the EHB decision.

Copies of the Environmental Hearing Board decision and the PUC order are enclosed.

On July 6, 1984, the Pennsylvania PUC adopted a resolution establishing a new investigation into Limerick Unit II, and in that order, required that the Philadelphia Electric Company show cause why the completion of Limerick Nuclear Generating Station, Unit II, would be in the public interest. A copy of PUC Motion is enclosed.

This combination of circumstances, along with those previously asserted by Del-AWARE in its previous 2.206 proceed-

E03
1/1

(1) Withdrawals from the Schuylkill River, (Subject to conditions described below);

(2) Withdrawals from the natural flow of the Perkiomen Creek at Graterford (subject to conditions described below);

(3) Withdrawals from the Delaware River (subject to conditions described below).

Each of these withdrawals is subject to limitations designed to protect water quality, in-stream and downstream uses. Withdrawals from the Schuylkill River are limited by the following conditions: (i) flows (not including flow augmentations from DRBC-sponsored projects) measured at the Pottstown gauge must exceed 342 mgd (530 cfs) with one power plant unit in operation and 362 mgd (560 cfs) with two units in operation; and (ii) no withdrawals may be made when water temperatures in the Schuylkill below Limerick exceed 15°C, except during April, May and June when the flow measured at the Pottstown gauge is in excess of 1158 mgd (1791 cfs).

Natural flows of the Perkiomen Creek may be used for cooling water only when creek flows measured at the Graterford gauge exceed 116 mgd (180 cfs) with one unit in operation and 136 mgd (210 cfs) with two units in operation. This condition assures that natural flows below Graterford will not be reduced by withdrawals when flows fall below the long-term median flow of 97 mgd (150 cfs).

Conditions imposed by DRBC further require that a minimum flow of 27 cfs (17.4 mgd) be maintained in the East Branch Perkiomen Creek at a gauge to be located at Bucks Road throughout from Bradshaw Reservoir to the East Branch and ending when pumping is no longer required for operation of the Limerick plant. For the remainder of the year, a minimum flow of 10 cfs (6.5 mgd) must be maintained in the East Branch.

Diversions from the Delaware River for cooling water purposes are prohibited when such withdrawals would reduce river flow measured at the Trenton gauge below 3000 cfs (1940 mgd). When River flows fall below 3000 cfs at Trenton, cooling water diversions from the Delaware must be curtailed, or compensated by releases made from upstream storage for such purposes.

Lake Galena Operations

Lake Galena is a multiple purpose facility, serving water supply, flood control and recreation purposes. The

operational plan for this facility was previously developed and approved at the time Lake Galena was designed and constructed. In so far as Lake Galena operations affect the operations of the Neshaminy Water Supply System, the following operating parameters and procedures apply.

Lake Galena is and will be operated to achieve and sustain a recreation pool at elevation 321.7 feet MSL throughout the recreation season, between Memorial Day and Labor Day. This recreation pool will be maintained, with minor fluctuations between elevations 320.7 and 321.7 feet through the recreation seaon. The zone of one foot at pool elevation 320.7-321.7 feet MSL involves approximately 60 million gallons of storage, which may be utilized to control reservoir inflow and releases for water supply and conservation purposes without affecting recreation uses.

During the recreation season, releases from the Lake to meet conservation release requirements and water supply needs, if not fully replaced by inflow to the Lake from natural flows of the North Branch Neshaminy Creek, will be made up by diversions of water from the Delaware River.

Following the conclusion of the recreation season, starting at pool elevation 321.7 feet MSL, Lake levels will be reduced by conservation releases and releases for water supply needs, on an "as needed" basis, drawing Lake levels down no further than the conservation pool elevation of 302.1 feet MSL. The total storage between the recreation and conservation pool elevations is 1.63 billion gallons. Because of this volume of storage, annual drawdowns during most years are not expected to lower storage to the conservation pool level.

Releases will be made, in any event, to draw down Lake Galena by at least 10 feet below the recreation pool elevation (e.g., to elevation 311.7 feet MSL or below) each year, and to sustain such lower elevation through one or more freezing periods, as a means of retarding the growth of algae in the Lake.

Refilling of Lake Galena will commence in the period of mid-December through January (following the freeze periods described above). Refilling will rely to the maximum extent possible on natural inflows to the Lake from the North Branch. At each point through the winter-spring refilling process, natural inflows will be monitored and evaluated. If natural inflows are projected to be inadequate to reach the recreation pool elevation of 321.7 feet MSL by the start of the recreation season, natural flows of the North Branch Neshaminy will be supplemented by pumping from the

Delaware River. If such supplemental withdrawals are required to refill Lake Galena, they will be projected as far in advance as possible and spread over the maximum number of days, in order to reduce the amount of the required daily withdrawal from the Delaware and minimize flow variations in the North Branch Neshaminy Creek above the Lake. (Consistent with conditions(s) of DRBC Docket D-65-76 CP(8), NWRA as operator of Lake Galena will submit to DER for review and approval a proposed initial protocol and plan for projecting inflow/refill requirements, to be refined on the basis of the first five years of experience with the system.)

Pennsylvania Dam Safety and Encroachments Permit No. 9-169 previously issued for Lake Galena requires a minimum conservation release of 1.5 mgd from the dam, or equal to the inflow to the Lake if less than 1.5 mgd. The conservation release is made by a fixed orifice set in the dam, providing an essentially uncontrolled release of 1.5 mgd at all times.

Bradshaw Reservoir Operations

Bradshaw Reservoir is designed to be operated essentially as a control structure, within the system, controlling the release and distribution of water diverted from the Delaware into the Perkiomen and Neshaminy watersheds. Of the reservoir's total operating capacity of 70 million gallons, 46 million gallons will be held in reserve for emergency storage (this storage is equivalent to one day's use or emergency shutdown requirements at Limerick). Six million gallons is assigned for silt buildup and counted as "dead storage". The remaining 18 million gallons, stored in the top three feet of the reservoir, will provide operating capacity.

Pumping rates at Point Pleasant will be triggered by storage elevation changes at Bradshaw. As releases are made to the North Branch Neshaminy for public water supply needs, or to the East Branch Perkiomen for cooling water requirements, elevations will lower in Bradshaw. As storage falls within the three foot operating range, 1, 2, 3 and 4 pumps at Point Pleasant will be triggered in sequence, and turned off in sequence as elevations in Bradshaw rise. This pattern moderates flow fluctuations in the Delaware River and provides more efficient utilization of the pumps. This type of sequenced operation is typical of water systems, and essentially the same as used by public water supplies which trigger well operations based on water levels in a storage tank.

Daily Operations

Unlike operating plans for large Federal multipurpose projects, or typical flood control projects (which follow operating curves in adjusting storage and release rates), the Point Pleasant operating plan is geared to daily operations and constant adjustments, based on the operating parameters and conditions described above. This form of operating plan is typical of water supply system operations. It is designed to make maximum efficient use of all sources, while conserving storage and flow and mitigating any potential environmental effects.

Operation of the Neshaminy Water Supply System, following the operating plan's parameters and conditions, will be conducted on a daily basis. There will be an instrumentation system connecting the Chalfont Treatment Plant with Lake Galena, Bradshaw Reservoir and Point Pleasant Pumping Station. Data will be immediately available to the Plant operators on flows from Lake Galena, the water level in Lake Galena, flows from Bradshaw Reservoir, the water level in Bradshaw Reservoir and the operation of the pumps at Point Pleasant. Treatment Plant personnel will operate the control gates which release water from Lake Galena and from Bradshaw Reservoir. To eliminate any shock effect on North Branch aquatic biota, all releases will be started at a low rate and increased gradually to the scheduled rate, and any adjustments in daily releases will be done gradually.

The Plant production on a particular day will be scheduled on the prior day on the basis of the anticipated water needs of the service areas. As part of the procedure, natural flow takings from Pine Run and from the North Branch will be estimated on the basis of projected stream flows and climatic conditions, and any necessary releases from Lake Galena will be set up. If the estimates show that Delaware River water will be needed, this will also be scheduled.

During the day adjustments will be made in the release from Lake Galena to compensate for any change from anticipated water needs. The travel time for a release from Lake Galena to reach the Plant is about three hours. Releases from Bradshaw Reservoir take about five hours to reach Lake Galena.

Operations for cooling water will similarly be adjusted on a daily basis.

Delaware River Withdrawals

A computer program was developed to determine the amount of Delaware River water needed under the proposed operating

plan. This program utilizes flow records of Neshaminy Creek at Langhorne, Pennsylvania to develop flows of Pine Run at the intake and of the North Branch into Lake Galena and at the intake. Account is then taken of Treatment Plant production, minimum flow releases at the intakes and from Lake Galena, water level elevation and water storage in Lake Galena, evaporation from Lake Galena and cooling water needs at Limerick, in order to determine the volume of water needed daily from the Delaware River. Three different sets of stream flow conditions were examined in this program: a wet year, an average year, and a dry year. The estimated monthly withdrawals, with average stream flow conditions, to provide for projected water needs of the years 1985, 1990, and 2000 are shown in Table 1, originally prepared by E.H. Bourquard Associates, Inc.

Table 1
PROJECTED DELAWARE RIVER WITHDRAWALS
(Average Stream Flow Year)

Month of Year	Water Supply Withdrawals in MG in:			Cool. Water Withdrawal in MG	Total Withdrawals, MG from Delaware River		
	1985	1990	2000		1985	1990	2000
January	0	0	0	220	220	220	220
February	0	0	0	199	199	199	199
March	0	0	10	220	220	220	230
April	0	30	90	213	213	243	303
May	101	205	370	220	321	425	590
June	203	400	740	1,205	1,408	1,605	1,945
July	289	470	685	1,265	1,554	1,735	1,950
August	277	455	670	1,258	1,535	1,713	1,928
September	0	0	0	1,178	1,178	1,178	1,178
October	0	0	25	1,149	1,149	1,149	1,174
November	0	0	30	213	213	213	243
December	0	0	20	220	220	220	240
Annual	870	1,560	2,640	7,560	8,430	9,120	10,200

NOTE: The above withdrawals provide for 5.3/2.73 mgd minimum flow releases in the North Branch and a 6.5 mgd minimum flow release in the East Branch, and include a 10% allowance for possible losses in transit.

The 10% allowance for possible losses in transit includes an allowance for channel storage, travel time, scheduling and evaporation. Because the natural streams being utilized during the pumping procedure are not uniform throughout the entire system, some of the "released" water will reach the water intake ahead of time and not be withdrawn; or some of the water will lag behind the withdrawal period and not be needed. In either case, the water is "lost" to the public water supply system and will become part of the stream flow downstream of the intake. Because of the expenses involved with pumping, the program will be refined once actual conditions have been observed to minimize these losses.

It should be noted that this program and the results itemized in Table No. 1 are a result of a simulated "typical" average stream flow year. If the entire Point Pleasant Project is approved, the program will be adjusted to reflect actual conditions - not simply typical ones.

The cooling water withdrawals shown in Table 1 are from an Environmental Report Operating License, prepared by Philadelphia Electric Company (PECO) for the Limerick Station. Again, these are estimated withdrawals based on weekly mean flows of (1) daily Perkiomen Creek flows at Graterford, (2) daily Schuylkill River flows and temperatures at Pottstown, and (3) hourly meterology from the LCS tower at the Station, during the period 1974-1977.

Emergency Operations

During drought and other water supply emergencies, withdrawals and operations for both public water supply and cooling water purposes are subject to modification or suspension, as directed by the Delaware River Basin Commission pursuant to Article 10 of the Delaware Compact, or by the Pennsylvania Department of Environmental Resources and Pennsylvania Emergency Management Agency pursuant to state statute.

2. Presently Appealed Actions

The appeals presently before the Board have been very briefly described in the Procedural Statement opening this adjudication. Additional details of these presently appealed actions are as follows.

Applications for permits for the structures necessary to divert and release the water of the Delaware were filed by NWRA and PECO in 1981 and early 1982. In addition, NWRA requested DER to certify to the Corps of Engineers pursuant to §401 of the Federal Clean Water Act that construction of the intake in the Delaware and realignment of the channel of Pine Run (a tributary to the Neshaminy Creek) would not permanently violate state water quality standards.

The Department conducted a very thorough and wide-ranging review and analysis of the possible environmental effects of the proposed project and its other harms and benefits. It then summarized its review in DER Exhibit 2, the Environmental Assessment Report from which we have quoted at length immediately *supra*. In September 1982, DER issued the §401 certification and the following permits pursuant to the Dam Safety and Encroachments Act, 32 P.S. §693.1 *et seq.*, the Flood Plain Management Act, 32 P.S. §679.101 *et seq.* and the Clean Streams Law, 35 P.S. §691.1 *et seq.*:

> Permit No. ENC 09-81 to NWRA for the water intake structure in the Delaware River, an intake conduit crossing the Delaware Canal, a water main crossing Hickory Creek and an energy dissipator and outlet channel in the North Branch;
>
> Permit No. ENC 09-51 to PECO for a water main crossing various streams in Plumstead and Bedminister Townships, Bucks County;
>
> Permit No. ENC 09-77 to PECO for an outfall structure, energy dissipator and channel stabilization in the East Branch; and
>
> Permit No. Dam 09-181 to PECO for the Bradshaw Dam and Reservoir.

The certification and the permits were appealed. Besides taking these appealed-from actions (which will be analyzed below) the Department took another action which is before us on appeal, viz., the issuance of a letter dated June 22, 1982 from DER official Richard L. Hinkle to counsel for NWRA, and also to counsel for the instant appellants, informing NWRA that no NPDES permit would be required for the release of water by NWRA to the North Branch. This determination was appealed by Del-Aware Unlimited, Inc. and docketed at Docket No. 82-177-M.

3. Previous Related Actions

It is very important for a proper perspective to note that the above actions are only the most recent of a multitude of official actions of various administrative agencies regarding aspects of the Point Pleasant Project. We again quote from DER Exhibit 2:

> DER and DRBC Reviews
>
> The basic Point Pleasant-Neshaminy Water Supply Project resulted from the 1966 Water Resources Study - Neshaminy Creek Basin, Pennsylvania (Pennsylvania Water Resources Bulletin No. 2), a joint report prepared by the Pennsylvania Department of Forests and Waters (now Department of Environmental Resources), the Soil Conservation Service of the U.S. Department of Agriculture, and Bucks and Montgomery Counties.
>
> The fundamental watershed project for Neshaminy Creek was approved by the Delaware River Basin Commission and added to the Delaware River Basin Comprehensive Plan on October 26, 1966, in *Neshaminy Creek Watershed Project, Bucks and Montgomery Counties, Pa. DRBC Docket No. D-65-76-CP.* This decision was supplemented by *Bucks and Montgomery County Commissioners, Neshaminy Creek Watershed Project, Bucks and Montgomery Counties, Pa., DRBC Docket No. D-65-76 CP(2)* (January 25, 1967). The supplemental docket added the entire multipurpose project as described in the 1966 Water Resources Study to the DRBC Comprehensive Plan.
>
> In 1970, Bucks County prepared and submitted the Feasibility Study of Delaware River Pumping Facilities at Point Pleasant, Pennsylvania, which assessed the proposed design of the Point Pleasant diversion facilities to provide public water supply in Bucks and Montgomery Counties, together with water quality augmentation for the Neshaminy Creek.

The Pennsylvania Water and Power Resources Board, on December 8, 1970, issued to Bucks County Water Allocation Permit No. WA-649, authorizing the withdrawal of Delaware River water for public water supply in the following amounts:

	To 1980	To 1990	To 1995
Average withdrawal, mgd	5	15	35
Maximum withdrawal, mgd	35	60	75

The permit recognized that the county had plans to pump additional quantities of water from the Delaware River at Point Pleasant for water quality augmentation in the Neshaminy Creek watershed and for industrial water supply in Montgomery County via Perkiomen Creek.

On March 17, 1971, DRBC approved *Commissioners of Bucks County, Point Pleasant Pumping Station, Bucks County, Pa., DRBC Docket No. D-65-76 CP(3).* This docket added the proposed project to DRBC's Comprehensive Plan, but deferred approval pursuant to Section 3.8 of the Compact until submission of final plans. The facilities included were a pumping station at Point Pleasant with the capacity and layout to handle all the required pumpage of the Delaware River water to the Neshaminy Basin, plus the proposed pumpage into the Perkiomen Creek Basin. A 66-inch transmission main, consisting of 14,000 feet of concrete pressure pipe and 5,300 feet of culvert pipe, would convey the total pumpage from the Point Pleasant Station to the terminus of this main, near Bradshaw Road, where the pumpage would be divided. The Neshaminy pumpage would flow by gravity through a 60-inch concrete culvert into the North Branch and on to Reservoir PA 617, Lake Galena. The Perkiomen pumpage would flow into a 35 mg open-storage reservoir, from where it would be pumped by means of a 46 mgd capacity station through 30,300 feet of 42-inch concrete presure pipe to the start of the Perkiomen watershed, from which point the water would flow by gravity in 6,300 feet of 36-inch concrete culvert pipe to the East Branch of Perkiomen Creek. As part of the 1971 docket review, DRBC prepared and processed an environmental statement for the project in accordance with the National Environmental Policy Act, entitled "Financial Statement - Environmental Impact of the Proposed Point Pleasant Diversion Plan, Bucks and Montgomery Counties, Pennsylvania".

In February 1973, DRBC prepared and submitted to the Council on Environmental Quality (CEQ) an expanded Final Environmental Impact Statement on the Point Pleasant Diversion Plan, Bucks and Montgomery Counties, Pennsylvania. The Final EIS concluded that the proposed project would be beneficial to the Neshaminy and Perkiomen watersheds and not detrimental to the Delaware River, provided that specific, listed mitigating measures were observed.

Meanwhile, due to the changes in growth patterns in Montgomery and Bucks Counties during the late sixties and continuing into the seventies, there was continued adjustment of the projected population to be served by the proposed public water supply facilities. The population projections and predicted supplementary surface water requirements of the Central Bucks County Service Area were updated in 1972, by a report entitled Master Plan for Water Supply - Bucks County, Pennsylvania - 1970. In 1975, further population projection adjustments were made resulting in amendments to the 1970 Master Plan for Water Supply. The adjustments were not of such magnitude to require change in the design capacities of the proposed plant. The final design of the plant started in 1975.

In early 1976, it was deemed necessary to review once again the projected population and resulting water needs. As a result, the final design of the treatment plant was halted to permit the completion of this review. During the period throughout 1976 and into early 1977, three additional studies of the Service Area were completed: The Central Bucks County Water Supply Study; the Water Supply Study for Montgomery County; and the Interim Projections Report for Bucks, Chester, Delaware, Montgomery, Philadelphia Counties, Pennsylvania. Based on these studies, the design capacity of the treatment plant was selected to remain at 20 mgd for the initial installation; however, the ultimate capacity was reduced from 80 to 40 mgd to meet the supplemental water needs of the service area.

In September of 1978, the Neshaminy Water Resources Authority filed with the Pennsylvania Department of Environmental Resources a water allocation permit application for the down-sized public water supply project. After an

extensive evaluation, summarized in the Report on the Application of the Neshaminy Water Resources Authority for Water Allocation from Pine Run, North Branch Neshaminy Creek, and Delaware River (November 1, 1978) ("DER Water Allocation Report"), the Department approved Water Allocation Permit No. WA-0978601, which superseded and replaced the permit No. WA-649 previously issued on December 8, 1970, by the Pennsylvania Water and Power Resources Board.

Concurrent with review of the basic Point Pleasant project and Neshaminy water supply system, a series of reviews were conducted regarding the Limerick Nuclear Generating Station.

In addition to providing treated water supply to Central Bucks and Montgomery Counties, the proposed Point Pleasant Project will withdraw Delaware River water for transfer via Perkiomen Creek to be used by the Philadelphia Electric Company (PECO) for cooling purposes at its Limerick Electric Generating Station located along the Schuylkill River near Pottstown, Pennsylvania.

DRBC Docket No. D-65-76 CP(3) (March 17, 1971) (referenced above), added the Perkiomen transfer element for Limerick to the overall Point Pleasant-Neshaminy project. As noted above, a Final Environmental Impact Statement on the Point Pleasant Diversion Plan, covering both the public water supply and Limerick transfers, was prepared by DRBC and filed with the Council on Environmental Quality in February 1973. The Final EIS of 1973, after considering various alternatives, concluded that a withdrawal from the Delaware River, subject to certain conditions, was necessary and proper to meet cooling water needs for the Limerick Station, and that such a withdrawal, if operated within the stated limitations, would not have a significant adverse effect on the environment.

The DRBC subsequently approved *Philadelphia Electric Company, Limerick Nuclear Generating Station, Limerick Township, Montgomery County, Pennsylvania, DRBC Docket No. D-69-210 CP* (March 29, 1973). This docket decision conditionally approved the water supply features of the project, subject to a specific list of conditions, particularly conditions relating to limits on diversions from the Schuylkill, Perkiomen and Delaware during low flow periods. One of the conditions for such withdrawal was

that the DRBC, at its sole discretion, would determine the adequacy of storage capacity in the basin necessary to provide sufficient water to meet PECO's consumptive water use at Limerick and to maintain a 3,000 cfs flow in the Delaware River at the Trenton gauge.

Approval of the water supply elements was based, at least in part, upon the previously approved Final EIS on the Point Pleasant Project. However, DRBC deferred a final decision on the Limerick Station per se until completion of a Final EIS by the Atomic Energy Commission (AEC) on the nuclear power plant and related facilities.

In November 1973, the U.S. Atomic Energy Commission's Directorate of Licensing completed the Final Environmental Statement related to the Proposed Limerick Generating Station, Units 1 and 2, Philadelphia Electric Company. Based on this EIS, the previous EIS prepared by DRBC, and the record compiled at hearings before the Atomic Safety and Licensing Board and the Appeal Board of the Nuclear Regulatory Commission (NRC), the NRC issued to Philadelphia Electric Company construction permits for the Limerick plant in March 1975. An extensive (96 pages) decision was rendered by the Atomic Safety and Licensing Appeal Board. See *In the Matter of Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2)*, Docket Nos. 50-352 and 50-353 (March 19, 1975). The decision addressed specifically numerous contentions made by intervenors in the AEC/NRC proceedings concerning the adequacy of the Final EIS prepared in 1973 by the Atomic Energy Commission.

The Atomic Safety and Licensing Appeal Board's decision, and NRC's issuance of construction permits for limerick, were appealed to the Third Circuit Federal Court of Appeals by the project's opponents. The appellants challenged the adequacy of the environmental impact statements relied on by the NRC, both the EIS prepared by the Atomic Energy Commission and that prepared by DRBC in February 1973. In particularly, appellants charged that the previous environmental impact statements had not properly assessed the impacts of water supply elements of the Limerick project, including the Point Pleasant diversion.

Based on the AEC's Final EIS and DRBC's own EIS of 1973, DRBC issued notice of intention to act upon Docket

No. D-69-210 CP (Supplement No. 1) in July 1974. Proceedings to amend the Commission's earlier decision on the Limerick Station, however, were deferred while objections filed by the Environmental Coalition for Nuclear Power were heard by a hearing officer appointed by DRBC.

Following hearings and argument before the Commission, in November 1975, DRBC proceeded with final action on the docket concerning construction of Limerick and related water supply facilities. *Philadelphia Electric Company, Limerick Nuclear Generating Station, Limerick Township, Montgomery County, Pennsylvania.*, DRBC Docket No. D-69-210 CP (Final) (November 5, 1975) included the Limerick project in the DRBC Comprehensive Plan. The docket further gave Compact Section 3.8 approval to construction of the Limerick Station, together with the Schuylkill River and Perkiomen Creek intake and diversion structures. The final docket imposed a series of conditions limiting the diversions and requiring specific measures to mitigate potential environmental impacts. Condition (c) required:

> 'If...the storage will not be adequate for all protected needs of the Basin, the applicant will build or cause to be built, at its own expense, at a location approved by the Commission, a reservoir of sufficient storage capacity to assure the water supply needed for consumptive use by the Limerick plant, during periods when such use would reduce the flow in the Delaware River at the Trenton gage below 3,000 cfs. Storage and release of water in such facility will be under the Commission's regulation, at the expense of the applicant.'

This DRBC docket decision was filed with the Third Circuit of Appeals prior to its decision on the then pending appeals of the Nuclear Regulatory Commission's action.

This Third Circuit's decision on the NRC appeals was rendered in *Environmental Coalition of Nuclear Power, Limerick Ecology Action, and Delaware Valley Committee for Protection of the Environment v. Nuclear Regulatory Commission and Philadelphia Electric Company*, No. 75-1421 (November 12, 1975). The Court of Appeals rejected the challenges to the environmental impact statements and, in essence, found the previous environmental assessments prepared by DRBC and the NRC adequate to satisfy the purposes of NEPA. The Third Circuit's decision and order were not appealed to the U.S. Supreme Court.

A year later, on September 30, 1976, DRBC adopted Resolution No. 76-13, concerning provision of supplementary water supply storage for certain power projects, including both the Limerick and Hope Creek Nuclear Generating Stations. The Commission exercised its authority under conditions set forth in earlier DRBC approval of Docket Nos. D-69-210 CP (Limerick) and D-73-193 CP (Hope Creek), and ordered the involved utility companies 'to proceed to develop, or cause to be developed, an application under Section 3.8 of the Compact, supported by an environmental report in compliance with the Commission's rules and regulations, for the construction of the required supplement storage.' The resolution further required that the application and accompanying environmental report be submitted by October 1, 1977.

The combined project once again came before DRBC in proceedings commencing in 1979, resulting in decisions rendered in early 1981. On January 27, 1979, PECO filed with DRBC application pursuant to Section 3.8 of the Compact for approval of the construction of its portions of the Point Pleasant pumping station, Bradshaw Reservoir, and transmission lines to the Perkiomen Creek. On July 5, 1979, NWRA filed application pursuant to Section 3.8 of the Compact for approval of construction of its portions of the Point Pleasant pumping station, the water treatment plant at Chalfont and the various transmission lines. Both Section 3.8 applications were supported by detailed 'environmental reports,' prepared by the applicants as required by the then applicable DRBC regulations, 18 C.F.R. Sections 401.51-401.53 (1977).

DRBC had available to it three final environmental impact statements, together with all the supporting data, as of the time it received the present PECO and NWRA applications. They were: (1) 'Point Pleasant Diversion Plan, Bucks and Montgomery Counties,' submitted by DRBC in 1973; (2) 'Limerick Generating Station, Units 1 and 2,' submitted by the AEC in 1973; and (3) 'Neshaminy Creek Watershed,' submitted by U.S. Department of Agriculture,

Soil Conservation Service in 1976. Each of these plans incorporated the concept of a withdrawal of a maximum of 150 mgd to the Perkiomen Creek for use as additional cooling water at Limerick, and the balance of the water to flow into the headwaters of the Neshaminy watershed with a withdrawal of approximately an equal quantity of water at Chalfont for water treatment and distribution for public consumption in sections of Bucks and Montgomery Counties.

Pursuant to DRBC's regulations on processing Compact Section 3.8 applications, DRBC prepared an environmental assessment on the projects. The Executive Director of DRBC, on the basis of the environmental assessment, recommended a 'negative declaration,' based on his conclusion that the proposed projects would have no significant adverse impacts on the environment. Public notice of intent to issue a negative declaration and of the preparation of the environmental assessment was given and a public hearing was held by DRBC on the Section 3.8 applications on November 18, 1980.

In August, 1980, DRBC prepared and published a 'Final Environmental Assessment for the Neshaminy Water Supply System' project sponsored by NWRA and PECO. This document contained approximately 230 pages, with cross-references and references by incorporation to voluminous documents, studies, reports and comments by individuals and public and private organizations. On February 18, 1981, DRBC granted the Section 3.8 applications of both PECO and NWRA, subject to certain expressed conditions and limitations. The construction details of the project were added to the Comprehensive Plan to the extent that such details were contained in the applications and had not previously been approved and included in the prior actions of DRBC.

These actions by DRBC were the subject of appeals filed before the U.S. District Court, Eastern District of Pennsylvania, in the matter of *Delaware Water Emergency Group, v. Gerald M. Hansler*, 536 F. Supp. 26 (E.D. Pa., 1981) *aff'd* No. 81-2622 (3d Cir., March 19, 1982). The primary issue before the court was whether DRBC had fully and fairly considered the environmental impacts of the proposed project, with particular emphasis on impacts upon basin water resources.

In rendering its decision rejecting these challenges, the District Court concluded:

> 'The record in this case makes four matters quite obvious. First, there have been at least three prior EIS's on the basis plan

and concept, all of which were available and considered by DRBC. With the Level B study, there have been at least four EIS's prepared. Second, the project has been under constant study and updating of factual information from the plan's inception to the present time, and indeed is subject to ongoing studies. Third, the only substantial change from heretofore approved plans based on prior environmental impact statements and other studies, is a substantial reduction in the quantity of water to be withdrawn for NWRA's water treatment plant. Fourth, the environmental assessment prepared is detailed, up-to-date and adequately considers any changed circumstances.'

By Compact signed by the four Basin States and the Federal Government, DRBC was created as the primary and lead agency of the parties to plan, coordinate and manage the water resources of this basin. It is DRBC's responsibility, recognized by Federal law, to equitably apportion the waters of the basin among the States and their respective political subdivisions, and to adopt and implement policies for the development, conservation and management of those resources.

This project and its operating conditions were made a part of the basin's Comprehensive Plan by unanimous action taken repeatedly over the past decade, and most recently in February 1981. Under the terms of the Compact, especially Compact Article 11 and Section 15.1(s) of Public Law 87-328, all Federal and State agencies are bound to recognize and act in a manner consistent with those water management policies and actions.

U.S. Army Corps of Engineers Review

In December 1980, the Neshaminy Water Resources Authority applied to the U.S. Army Corps of Engineers for a permit to (1) construct a water intake structure in the Delaware River and under the Pennsylvania Canal at Point Pleasant (Application No. NAPOP-R-80-0534-3); and (2) to relocate the channel of Pine Run and reshape the channel of North Branch Neshaminy Creek at Chalfont Borough (Application No. NAPOP-R-80-0813-3). On April 6, 1981, the Corps issued a Public Notice that NWRA had applied for the above-mentioned permits. On August 10, 1981, the Corps issued a Notice of Public Hearing concerning NWRA's applications and scheduled the hearing for September 15, 1981. The hearing was held as scheduled. A supplement to the original Public Notice for the intake structure application indicated some revisions to the project was issued February 9, 1982.

Since the original submission, the Corps has been evaluating these proposals. As of this date, the Corps has not taken any final action on these applications.

The Corps has undertaken its own environmental assessment of the proposed project, and pursued consultation procedures required under the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Historic and Preservation Act to assess potential impacts on historical resources, fish and wildlife, and endangered species.

B. NPDES PERMIT

Now that we have described the Point Pleasant Project and summarized its tortured course through other administrative agencies, the stage is set to examine the issues raised by the appellants in the light of the record. We begin this task with the legal issue raised by appellants' appeal docketed at Docket No. 82-177-G, to wit, whether DER acted arbitrarily and capriciously (or in violation of law) in failing to require NPDES permits for the diversion of Delaware River water into the North Branch of Neshaminy Creek and East Branch of Perkiomen Creek ("North Branch" and "East Branch", respectively).

In point of fact, DER has made no explicit decision regarding the need for a NPDES permit for the diversion of water into the East Branch (it only made an explicit written decision regarding the North Branch because it was requested to do so by the counsel for NWRA and the appellants). Therefore, we could hold that as to the East Branch there has been no final decision of DER regarding the NPDES permit such as to give this board jurisdiction. *Standard Lime & Refractories Co. v. DER*, 2 Pa. Cmwlth. Ct. 434, 279 A.2d 383 (1971); *DER v. New Enterprise Stone and Lime Co., Inc.*, 25 Pa. Cmwlth. Ct. 389 (1976). We shall not, however, follow such a course. Instead, we shall treat the determination regarding the North Branch as though it also applied to the East Branch. We shall do this in part because none of the parties has raised this jurisdictional issue in the lengthy and competent briefs they filed in the issue; moreover, while the board does have authority to consider its jurisdiction *sua sponte*, it should not *sua sponte* dismiss an appeal on jursidictional grounds in any but the clearest circumstances, especially an appeal which has been before the Board as long as the instant appeal (at Docket No. 82-177-G).

Besides, under the instant circumstances our lack of jurisdiction on this East Branch NPDES permit issue is not altogether clear. On the contrary we hold we do have jurisdiction, because we find that DER made an implicit decision regarding the need for a NPDES permit for the discharge to the East Branch.[3] As DER acknowledged in its Environmental Assessment, the above permit was issued pursuant to DER's duties as a trustee under Article I, Section 27 of the Pennsylvania Constitution, which *inter alia* requires "compliance with all applicable statutes and regulations relevant to the protection of the Commonwealth's public natural resources..." *Payne v. Kassab*, 11 Pa. Commonwealth Ct. 14, 312 A.2d 86 (1973). This duty is repeated in 25 Pa. Code Chapter 105, which specifically governs the issuance of the above permit.

Clearly, the Federal Clean Water Act, and especially the NPDES permit program of that Act (which was delegated to the Commonwealth by virtue of an agreement dated June 1978), is a "statute relevant to the protection of Pennsylvania's public natural resources"; thus DER would have had to determine that this federal Act had been complied with prior to issuing the above Chapter 105 permit. The reasoning upon which DER relies for its North Branch decision, being primarily a legal analysis, would apply with equal force to the East Branch.

NWRA also argues that the EHB lacks jurisdiction (under the Federal Clean Water Act) because the appellants have not stated a cause of action under federal law. NWRA cites various federal cases, all of which discuss the rights of plaintiffs to begin actions in federal courts.

NWRA, however, has neglected to cite the controlling EHB decisions. It is the duty of this board to review (properly appealed) actions of DER, not

---

3. This implicit decision was not unlike DER's implicit finding of a public necessity for the right of way across the Roosevelt State Park (see discussion below). DER's decision was implicit in its issuance of Permit No. ENC 09-77 to PECO for an outfall structure in the East Branch.

to review actions of any federal agency or to act as a court of original jurisdiction for environmental causes of action. When DER takes an action under federal law, our jurisdiction rests not upon the federal statute but rather upon §1921A of the Administrative Code of 1929, 71 P.S. §510-21. *Latrobe Municipal Authority v. DER*, 1975 EHB 422. Our jurisdiction can be neither expanded nor contracted by federal statutes.

1. Standing

Before we can proceed to the merits of the "no NPDES decision", we still must take up another jurisdictional issue, namely the appellants' standing to appeal DER's decision not to require an NPDES permit for the diversion of water from the Delaware River to the North Branch of the Neshaminy. NWRA argues that the appellants do not have standing to appeal this decision.[4] There has been no corresponding challenge to the appellants' standing to appeal DER's failure to require an NPDES permit for discharge into the East Branch of the Perkiomen (see our jurisdictional discussion immediately, *supra*, concerning DER's East Branch "no NPDES permit" decision).

The relevant facts concerning the appellants' standing to raise the issue of DER's "no NPDES decision" for the North Branch are as follows. During the hearing the appellants, notably Del-Aware, Inc., failed to place on the record the name of any Del-Aware member who reasonably believably could have had standing to raise this NPDES issue; for instance, Del-Aware failed to place on the record the name of any Del-Aware member residing upon the North Branch. This failure was explained by Del-Aware's counsel as having resulted from an NWRA law suit seeking damages against Del-Aware's members. NWRA admitted that

---

4. Although we here (section III B of this adjudication) are concerned primarily with the "no NPDES decision", our discussion *infra* of the appellants' standing to appeal the "no NPDES decision" for the North Branch (the appeal docketed at 82-177-G) applies equally well to the appellants' standing to appeal DER's grant of Permit No. ENC 90-81 to NWRA for, *inter alia*, construction of an energy dissipator and outlet channel in the North Branch (the appeal docketed at 82-219-G).

it had filed such a suit, and refused to hold harmless any Del-Aware member whose identity was revealed in these proceedings.

Therefore, the Board requested, and DER's counsel generously agreed, that Del-Aware would disclose the identity of relevant members to DER, who would undertake to verify this information on behalf of all parties. The information was not immediately forthcoming from Del-Aware. On May 17, 1983, the last day of the evidentiary hearings on these appeals, DER informed the Board and the parties that this information had not been received, although Del-Aware's counsel stated that he thought it had been furnished (Tr. 4262-64). NWRA's counsel then renewed his previously offered motion to dismiss Del-Aware's appeals (of NWRA's construction permit and of the North Branch "no NPDES decision") for lack of standing; NWRA's counsel also argued that the facts before the Board concerning Del-Aware's standing should not be supplemented by any evidence made available after the evidentiary hearing was closed, when NWRA would not be able to cross-examine.

Nevertheless, Mr. Harnish, who at the time still was the responsible Board Member in charge of these appeals, ruled that additional information bearing on Del-Aware's standing would be accepted, provided it was furnished by Del-Aware prior to submission of its brief (Tr. 4265). On June 27 and June 29, 1983, Edward Gerjuoy--the Board Member who by then had taken over these appeals following Mr. Harnish's resignation from the Board--issued Orders which, *inter alia*, informed the parties of the schedule for briefing the issues involved in the appeal docketed at 82-177-H (now 82-177-G), the appeal of DER's "no NPDES decision" for the North Branch. Del-Aware's brief in response to these Board Orders was filed July 20, 1983; this brief did not discuss Del-Aware's standing, and was not accompanied by any new information bearing on Del-Aware's standing. NWRA's brief in response to the aforementioned Board Orders, filed August 8,

1983, asserted that Del-Aware had not yet filed the requested additional information, and renewed its argument that Del-Aware's appeals now docketed at 82-177-G and 82-219-G be dismissed for lack of standing.

The Board has not yet ruled on any of the issues argued in NWRA's brief, including the standing issue; those rulings have been deferred to this adjudication. In the meantime, between August 8, 1983 and the date of this adjudication, other events relevant to this standing issue did occur. On October 6, 1983, DER's counsel wrote the Board as follows (in pertinent part):

> Investigation of the first line provided by Mr. Sugarman proved inconclusive, so after the hearing was over, Mr. Sugarman provided me with one additional name and address. I had an experienced member of DER's technical staff investigate the alleged property ownership in the Bucks County Courthouse records. He found that the named individual member of Del-AWARE does indeed own riparian property along the North Branch Neshaminy Creek in the area to be affected by the water supply portion of the Point Pleasant project.

This October 6, 1983 letter from DER's counsel does not state when this additional information was received from Del-Aware's counsel, Mr. Sugarman. However, the Board has been informed by DER's counsel--and sees absolutely no reason to doubt--that DER received the additional name and address on or about June 8, 1983, well before Del-Aware's aforementioned brief was submitted.

On December 8, 1983, Mr. Gerjuoy presided over a non-evidentiary hearing which disposed of various pending matters in these appeals. At this hearing, the issue of Del-Aware's standing again was discussed. The Board refused to accept NWRA's argument that Del-Aware's failure to furnish evidence sufficient to confer standing before the evidentiary hearings closed was *per se* reason to dismiss the questioned appeals (Tr. December 8, 1983, pp. 58-9). However, the Board agrees that evidence justifying standing should be on the record; as the Board said, "giving a secret list to DER,...,is definitely

irregular." Del-Aware therefore was ordered to provide NWRA with a list of Del-Aware members who could confer standing on Del-Aware, including addresses, distances from the North Branch of properties owned, etc. NWRA was given the opportunity to respond to the list, and it was understood that, if necessary, the hearings would be reopened to take evidence under oath on any of Del-Aware's factual allegations which were critical to Del-Aware's standing and were disputed by NWRA. (See paragraph 5 of this Board's Order dated December 12, 1983, at Docket Nos. 82-177-G and 82-219-G.)

The list ordered on December 8, 1983 was filed by Del-Aware on December 22, 1983. In pertinent part, the list reads as follows:

> The following members of Del-AWARE Unlimited, Inc., who live on and near the North Branch Neshaminy Creek, and use and enjoy the creek, will be directly and substantially impacted by NWRA's use of the Creek as a faucet to carry water from the Bradshaw Reservoir to the proposed Chalfont treatment plant:
>
> a. Alistair Kyle
> Fretz-Clinton House
> Fountainville, PA 18923
>
> Alistair Kyle resides at Fretz-Clinton House, approximately two miles north of the proposed discharge point into the North Branch Neshaminy Creek in the area of the proposed discharge. He enjoys the pure and unpolluted state of the creek, and his enjoyment would be directly impacted by NWRA's proposed action. Mr. Kyle has been a contributing member of Del-AWARE since April 15, 1983.
>
> b. John and Alice Thorpe
> Carverville & Street Rds.
> R. D. #2 Doylestown, PA 18901
>
> John and Alice Thorpe live and own property approximately two miles south of the affected portion of the North Branch Neshaminy. John Thorpe, in addition to being a member of Del-AWARE, is affiliated with the Paunacussing Watershed Association, and is immediately concerned with the degradation of the water quality in the North Branch Neshaminy. Both Alice and John Thorpe enjoy the unspoiled beauty of the North Branch. They have been contributing members of Del-AWARE since January 15, 1983.

c. Reginald and Rosalind Snyder
325 Bradford Ave.
Warrington, PA

Reginald and Rosalind Snyder, who live in Warrington, own property and a home within several hundred yards of the affected portion of the North Branch, at the intersection of Curly Hill Road and Route 611. The home is occupied by their son, David Snyder. Reginald and Rosalind Snyder frequently visit their son and when they do, they enjoy hiking and walking along the North Branch and they enjoy viewing the North Branch in its present unspoiled state from their property. Reginald and Rosalind Snyder first contributed to Del-AWARE Unlimited, Inc. in 1981.

d. David Snyder
8 Poplar Lane
RD #5 Doylestown, PA 18901

David Snyder resides in the home owned by his parents Rosalind and Reginald Snyder, within several hundred yards and within view of the North Branch Neshaminy. He frequently takes hikes up and down the North Branch, and enjoys the view he has of it from his home on a daily basis. The North Branch is a very small stream at that location, and Mr. Snyder fears that the flow from NWRA's proposed discharge would radically alter its character, and that he would be adversely affected thereby. Mr. Snyder has been a contributing member of Del-AWARE Unlimited, Inc. since January, 1983.

e. Jonathan and Mary Davenport
Gardenville-Pt. Pleasant Pike
Gardenville, PA 18926

Jonathan and Mary Davenport live and own property within the immediate vicinity and within view of the North Branch, close to the point of discharge. They have lived there for thirty years. The Davenports regularly walk along the stream, and enjoy its unspoiled character, which they can view from their home, looking down across an intervening cornfield. They would be directly adversely impacted in their enjoyment of the stream by NWRA's discharge of water into the North Branch, which would substantially increase its flow and change its character. John and Mary Davenport first contributed to Del-AWARE Unlimited, Inc. approximately two years ago.

f. Susan Allison
Pt. Pleasant Pike
Gardenville, PA. 18926

Susan Allison lives and owns property in the immediate vicinity of the North Branch, near the point of discharge. She often hikes along the creek, and enjoys its unspoiled character. Her use and enjoyment would be directly affected by NWRA's proposed discharge into the North Branch. Ms. Allison has been a contributing member of Del-AWARE Unlimited, Inc. since November, 1982.

g. David Windhold
Dave's Sporting Goods
1127 North Easton Road
Doylestown, PA 18901

David Windhold owns a six acre homestead on North Eastern Road which abuts approximately 500 yards of the affected portion of the North Branch Neshaminy Creek. On the property is a residence occupied by Mr. Windhold's daughter Dianne and her husband. This lot fronts on approximately 400 yards of the Creek. Also located on the property is Mr. Windhold's business, Dave's Sporting Goods, the parking lot of which abuts approximately 100 yards of the Creek.

Mr. Windhold and his family members hike along the stream, use and enjoy it on a daily basis. Some of Mr. Windhold's customers fish in the Creek, specifically for catfish and bass. In the past, flows from the North Branch have at times overflowed its banks and flooded his parking lot. Mr. Windhold fears that the NWRA discharge into the North Branch will increase the flooding problems on his property. Thus, Mr. Windhold and his family members are exposed to immediate potential impacts such as flooding, erosion, and interference with their daily use and enjoyment of the North Branch.

Mr. Windhold has been a supporter of Del-AWARE Unlimited, Inc. for the past two years, and has been contributions in the name of Dave's Sporting Goods.

NWRA has argued, in its response dated January 20, 1984, that the above list is insufficient to confer standing on Del-Aware. NWRA points out, first of all, that Alistair Kyle, John and Alice Thorpe, David Snyder and Susan Allison are described in the above list as having been "contributing members" of

Del-Aware no earlier than November, 1982. The appeal docketed at 82-177-G was filed on July 21, 1982; the appeal docketed at 82-219-G was filed on September 20, 1982. Persons who became members of Del-Aware after the appeals were filed cannot now be named as justification for granting Del-Aware standing to appeal; Del-Aware needed standing at the time it appealed. Consequently the persons named earlier in this paragraph do not confer standing on Del-Aware to prosecute the instant appeals.

On the other hand, it appears that the other persons named by Del-Aware, though also objected to by NWRA, can confer standing on Del-Aware. In particular, the Board now has been informed by DER (and again sees no reason to doubt) that Reginald and Rosalind Snyder are the riparian property owners originally idenfified by Del-Aware on or about June 8, 1983 (see our quotation, *supra*, from DER's October 6, 1983 letter to the Board). Furthermore, NWRA concedes (January 20, 1984 response, p. 9) that David Windhold owns property fronting on the North Branch. These property interests of the Snyders and Windhold are sufficient to confer standing on these individuals to appeal DER actions possibly affecting the North Branch, under the test of *William Penn Parking Garage, Inc. v. City of Pittsburgh*, 464 Pa. 168, 346 A.2d 269 (1975).

However, NWRA also objects that Del-Aware has not shown these just-named individuals were members of Del-Aware when the appeal was filed. We agree with this objection of NWRA's. The Snyders are said to have "first contributed" to Del-Aware in 1981; Mr. Windhold is termed "a supporter" of Del-Aware for the past two years. These phrases do not obviously make the Snyders or Windhold members of Del-Aware at the pertinent time. We realize that citizen groups like Del-Aware tend to be loose organizations, wherein the criteria for "membership" are likely to be equally loose. But Del-Aware, Inc. is incorporated, and should have kept "membership" lists of some sort. In any event, NWRA is entitled to have Del-Aware prove that standing is legally deserved.

Therefore, in view of the claimed locations of the Snyder and Windhold properties, we provisionally do grant Del-Aware standing in the appeals docketed at 82-177-G and 82-219-G; but under 25 Pa. Code §21.122(a)(2) we will allow NWRA (should it so request) to have the hearings reopened for reconsideration of the evidence supporting Del-Aware's standing. If the hearings are reopened for this purpose, the evidence offered will be restricted to the issues of whether and when the Snyders and Windhold were members of Del-Aware, and the locations of their properties. At this late date, we are not going to litigate whether Jonathan and Mary Davenport, who live "within the immediate vicinity and within view of the North Branch," have interests deserving standing under *William Penn, supra*. The time--for Del-Aware to have clearly established the persons named on December 22, 1983 (listed *supra*) have interests meeting the *William Penn* standard--is long past. The immediately preceding rulings in this paragraph are consistent with the understanding reached on December 8, 1983, described *supra*. We already have ruled in an earlier paragraph, and do not expect to reconsider, that Alistair Kyle, John and Alice Thorpe, David Snyder and Susan Allison cannot confer standing on Del-Aware.

In making the rulings in the preceding paragraph, we have rejected an additional argument of NWRA's, to the effect that Del-Aware cannot obtain standing from the mere fact that some of its individual members might have had standing to appeal; according to NWRA, it is necessary to show--and it has not been shown--that Del-Aware itself, as a corporate entity, meets the *William Penn* standing test. NWRA has bolstered its argument with citations to an imposing array of precedents. However, the Board has examined this question of so-called "representational standing" in the recent past, and has held that the Pennsylvania courts "now would rule" an association has standing to represent its members in an appeal if some of those members themselves would have standing to appeal.

Concerned Citizens of Rural Ridge v. DER, Docket No. 82-100-G, 1982 EHB 522 (Opinion and Order, November 22, 1982). Although the Citizens Association in *Rural Ridge* was not incorporated, we believe the logic of *Rural Ridge* governs the standing issue in the instant appeal, assuming Del-Aware indeed can show it has members who would have had standing when Del-Aware actually filed its appeal. In our opinion, the recent Pennsylvania Supreme Court holdings in *Franklin Township v. DER*, 452 A.2d 718 (Pa. 1982) and in *Susquehanna County v. DER*, 458 A.2d 929 (Pa. 1983), though not quite on point with *Rural Ridge*, *supra* or the instant appeal, reinforce our reasoning in *Rural Ridge* and bolster our present reliance on that Board holding.

We close this discussion of Del-Aware's standing with the observation that--as NWRA accurately points out--no evidence has been offered that the individual appellants (Val Sigstedt and Colleen Wells) in the appeal docketed at 82-177-G had standing; the same assertion holds for the individual appellants (James Greenwood, Colleen Wells, Richard Meyers and Marion Masland) in the appeal docketed at 82-219-G. Therefore, insofar as these just-named individuals are concerned, their respective individual appeals at 82-177-G and 82-219-G are dismissed for lack of standing, without prejudice to Del-Aware's possible standing (as discussed *supra*) to prosecute these same appeals.

2. DER's Legal Basis For Its Decision

Having determined: (1) that we do have jurisdiction under the Administrative Code; (2) that DER's "no NPDES permit" determination on the North Branch should be treated as applying also to the East Branch; and (3) that the appellants presently have personal standing to challenge this determination, let us examine what this determination constitutes.

The following discussion of this determination (NWRA brief in response to this Board's Order of June 27, 1983, pp. 19-22) is fair, and we adopt it:

On June 22, 1982, in connection with the Department's review of NWRA's application for a permit under the Dam Safety and Encroachments Act (NWRA Exh. 31) and incident to its Environmental Assessment on the Point Pleasant Water Supply Project (DER Exh. 2), the Department concluded that no NPDES Permit would be required to authorize the release of Delaware River water into the North Branch Neshaminy Creek. (Exh. A. to appellants' 'Notice of Appeal'). DER's rationale for its ultimate conclusion that no NPDES Permit would be required is set forth in a memorandum from Robert W. Adler, Assistant Counsel, Bureau of Regulatory Control, Maxine Woelfling, Director, Bureau of Regulatory Counsel and Douglas Blazey, Chief Counsel to Leon Gonshor, Director, Norristown Regional Office. The memorandum, included as Exhibit A to the appellants' Notice of Appeal, states, in pertinent part:

> This memorandum addresses the question whether the Point Pleasant Diversion Project requires an NPDES Permit pursuant to the recent court decision *National Wildlife Federation v. Gorsuch*, which I forwarded to you with my memo dated March 15, 1982. It is the opinion of this office that a permit is not required for the Point Pleasant Project.
>
> The *National Wildlife Federation* case did not rule that all dams were point sources *per se* and, therefore, subject to the NPDES Permit requirements. Rather, the court rules that the plaintiffs had successfully proven as a question of fact that certain dams 'add pollutants' to navigable waters within the meaning of Section 502(12) of the Clean Water Act. Since EPA has not published categorical standards governing which types of dams 'add pollutants' to navigable waters within the meaning of the court decision, the question of whether the Point Pleasant project requires a permit is a question of fact. The memorandum to you from Charles Rehm, dated April 6, 1982, entitled 'Need for Public Hearing, Point Pleasant Diversion, Neshaminy Water Resources Authority (NWRA)' indicates that there will be no additions of pollutants to the relevant waterways within the meaning of the National Wildlife Federation decision. Therefore, unless contrary information is discovered indicating that pollutants will in fact be discharged from the Point Pleasant facilities, no NPDES Permit is required.

The singular substantive legal issue addressed in the Department's memorandum and now presented to the Board in the captioned appeal (Docket No. 82-177-H) is whether the diversion of Delaware River water to the North Branch of

the Neshaminy Creek,...constitutes the 'discharge of a pollutant' as that phrase is defined in the Clean Water Act. It is NWRA's position, based upon a review of the Clean Water Act's substantive provisions, that it does not. As a result, no NPDES permit is required.

Section 402 of the Clean Water Act, 33 U.S.C. §1342, establishes the National Pollutant Discharge Elimination System ('NPDES' or "402') permit program. Section 402(a)(1) of the Act provides in pertinent part:

> ...the Administrator may...issue a permit for the discharge of any pollutant, notwithstanding Section 1311 [301(a)] of this title, upon condition that such discharge will meet either all applicable requirements under Sections 1311 [301], 1312 [302], 1316 [306], 1317 [307], 1318 [308] and 1343 [403] of this title, or prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provision of this chapter. (emphasis supplied).

Section 301(a) of the Act, 33 U.S.C. §1311(a) provides:

> Except in compliance with this section and Sections 1312 [30], 1316 [306], 1317 [307], 1318 [308], 1342 [402] and 1344 [404] of this title, the discharge of any pollutants by any person shall be unlawful (emphasis supplied).

Thus the discharge of any pollutant is unlawful unless, *inter alia*, one has a Section 402 permit for same.

1. What constitutes a "Discharge of a Pollutant?"

Query, how did Congress define the term discharge of any pollutant? Reference to the definitional section of the Act provides the answer.

Discharge of any pollutant is defined at Section 502 (12), 33 U.S.C. §1362(12), as:

> ...any addition of any pollutant to navigable waters from any point source...

Point Source is defined at Section 502 (14), 33 U.S.C. §1362 (14), as:

> ...any discernible, confined and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessal or other floating craft, from which pollutants are or may be discharged. (emphasis supplied).

Neither NWRA nor any other party disputed that the North Branch Neshaminy Creek or the East Branch Perkiomen Creek constitute "navigable waters" as that term is defined in the Act. Also, NWRA agrees with appellants that "the outflow pipe into the North Branch would constitute a point source", if the Board finds the Delaware River is a "pollutant" (NWRA brief just quoted, p. 23). Thus, the key questions here confronting us are the following:

a. What is a "pollutant"?

b. What constitutes an "addition of any pollutant"?

Unfortunately, no party has cited a case applying the Act's definitions of "pollutant" and "addition of any pollutant" to a diversion of water from one river to another, i.e., to a factual situation identical to the instant one. However, all the parties except the appellants found the decision of the D.C. Circuit Court in *National Wildlife Federation v. Gorsuch*, 693 F.2d 156 (D.C. Cir. 1982) ("NWF") to be applicable and controlling. Again we quote from NWRA's brief in response to this Board's Order of June 27, 1983 (pp. 24-25):

> ...National Wildlife Federation brought a declaratory judgment action against the Administrator of the Environmental Protection Agency seeking to compel the agency to require dam operators to obtain NPDES Permits. Establishing at trial that the retention of water by large storage dams caused water quality changes having adverse impacts on downstream water quality when subsequently released, National Wildlife Federation argued 'that any adverse change in the quality of reservoir water from its natural state involves a 'pollutant' and that release of polluted water through the dam into the downstream river constitutes the 'addition' of a pollutant to navigable waters 'from' a point source.' 693 F.2d at 165. (emphasis supplied)
>
> The Circuit Court of Appeals for the District of Columbia disagreed holding that water quality conditions do not constitute 'pollutants' within the statutory definition.
>
> These dam-induced changes are water conditions not substances added to the water.

693 F.2d at 171.

> The court, by holding that water quality conditions did not constitute 'pollutants,' explicitly adopted the test applied by the Environmental Protection Agency for determining when a particular activity constitutes an addition of a pollutant from a point source:
>
> > ...addition from a point source occurs only if the point source itself physically introduces a pollutant into water from the outside world. In its view, the point or nonpoint character of pollution is established when the pollutant first enters navigable water, and does not change when the polluted water later passes through the dam from one body of navigable water (the reservoir) to another (the downstream river).
>
> 693 F.2d at 175.
>
> The EPA 'addition of a pollutant' test endorsed by the Circuit Court in *National Wildlife Federation* was implicitly endorsed by the Fourth Circuit Court of Appeals decision in *State of Missouri v. Department of the Army*, 672 F.2d 1297 (4th Cir. 1982).

NWRA, PECO and DER assert that the Department correctly applied this test in its analysis when it concluded that NWRA will not "add pollutants" to the North Branch or East Branch. These parties assert that diverting Delaware River water to the North Branch Neshaminy Creek will not "physically introduce" a pollutant "from the outside world" into the withdrawn Delaware River water; they argue additionally that Delaware River water is not a pollutant.

Appellants respond to these arguments by arguing that *NWF, supra* is distinguishable from the instant case; even if not distinguishable, appellants argue in the alternative, *NWF* actually supports the appellants' position when the teachings of this decision are transposed to the instant facts.

After a careful analysis of *NWF, supra* and the other cited cases, we are inclined to believe the circumstances of the instant matter are sufficiently different from those pertaining in *NWF, supra* that--to the extent that *NWF* provides any guidance to us--it should guide us to remand this matter to DER. Our reasons for coming to this conclusion are elaborated in the two

immediately following subsections (III B 3 and III B 4).

3. Deference Owed DER's Decision

As explained in the quote *supra* from NWRA's brief, DER's rationale for its ultimate conclusion that no NPDES permit would be required was set forth in a memorandum from DER attorneys Adler, Woelfling and Blazey. These DER counsel relied in large part on *NWF, supra*. In *NWF*, the Circuit Court began by examining the types of environmental impacts some reservoirs cause. The court compared these dam-induced water quality changes--low dissolved oxygen, dissolved minerals and nutrients (from bottom muds), temperature changes, sediment and super-saturation--to the definition of "po`lutant" in §502(6), 33 U.S.C. §1362(6) to wit,

> ...dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water.

Noticing that none of the dam-induced water quality changes were specifically included in the pollutant list, and that EPA had construed the Act as excluding these changes from the definition of pollution, the Circuit Court held that the District Court had erred in not giving significant deference to EPA's construction of pollution. However, the Circuit Court concluded its opinion as follows:

> In closing, we emphasize the narrowness of our decision. It is not our function to decide whether EPA's interpretations of the term "discharge of a pollutant" is the best one or even whether it is more reasonable than the Wildlife Federation's interpretation. We hold merely that EPA's interpretation is reasonable, not inconsistent with congressional intent, and entitled to great deference; therefore it must be upheld.

This last quotation shows that *NWF, supra* scarcely was a ringing affirmation of EPA's thesis that dam discharges do not require NPDES permits.

Moreover, it is clear from the language in *NWF* that the Circuit Court chiefly visualized a discharge from a dammed river or stream into the lower channel of the same river or stream. Genuine pollutants, such as dissolved minerals (as opposed to temperature, which is more accurately classified as a water "quality"), would reach the downstream channel whether or not the dam was present; the major function of the dam is to change the instantaneous rates--but not the average rate--with which pollutants flow into the downstream channel.

Therefore it is far from apparent that *NWF* should be applied to the instant water project, wherein Delaware River water is being directed to a stream channel that the Delaware River otherwise would never reach. If NWRA's interpretation of *NWF* were to be followed literally, DER would have no right to establish pollutant concentration limits for discharges of the Delaware into the Neshaminy or Perkiomen, no matter how polluted the Delaware or how pristine the receiving streams; we do not believe this outcome would be consistent with Congress' intent when it passed the Federal Clean Water Act. Nor do we believe NWRA's interpretation would be consistent with the Legislature's intent in passing the Clean Streams Law, 35 P.S. §§691.1 *et seq.* or with the Environmental Quality Board's intent in promulgating the regulations in 25 Pa. Code Chapter 92. In fact, the EQB has made it explicit that the Commonwealth's standards for protecting water quality may be stricter than would follow solely from application of federal standards. 25 Pa. Code §92.17.

Furthermore, we question whether the extravagant deference (exemplified by the *NWF* decision) paid by federal courts to Federal administrative agencies should carry over to the Board's review of DER actions. This historical deference of the federal courts grows out of the constitutionally mandated separation of powers between administrative agencies (which are within the executive branch of government) and reviewing courts (which are located in the judicial branch).

In sharp contradiction, the Environmental Hearing Board is a quasi-judicial body located, as is DER, within the executive arm of Pennsylvania's government. 71 P.S. §510-21. Moreover, this Board is specifically charged with the duty to substitute its discretion for that of DER where, in the Board's opinion, DER has abused its discretion. *Warren Sand & Gravel Co., Inc. v. DER*, 20 Pa. Cmwlth. Ct. 186, 341 A.2d 556 (1975).

Even in the federal court system, statutory construction by administrative agencies is not given as much deference as questions involving questions of technical or scientific expertise, *E. I. duPont de Nemours & Co. v. Train*, 430 U.S. 112, 97 S. Ct. 965, 51 L. Ed. 2d 204 (1977). The D.C. Circuit distinguished the *duPont* case because it found the presence of scientific and technical aspects to EPA's characterization of dams as nonpoint sources, but DER's "no NPDES permit" decision under review here was based upon a legal analysis conducted by its counsel rather than upon any substantial application of technical or scientific expertise. (See Tr. 1783 for the testimony of DER official Charles Rehm.)

In determining what deference to pay to an administrative agency's decision, the federal courts also look to whether the determination was consistently held and had important policy considerations or was policy free. *NWF, supra*, 693 F.2d 156, 170. The D.C. Circuit found that EPA's determinations that dams were nonpoint sources had been contemporaneous with the Clean Water Act and had been consistently applied by EPA over the years. Of course, DER's determination, being recent, has not acquired the right to deference enjoyed by EPA's decision. Perhaps, more importantly, the court in *NWF, supra*, noted that EPA, faced with limited resources to carry out the NPDES permit program and faced with 2,000,000 dams (50,000 large dams to be permitted) had made a policy determination to take dams out of its NPDES permit program. Since it is EPA rather

than the courts which must process the permit applications the Courts quite rightly deferred to EPA's determination.

DER has not pointed us to any policy consideration supporting its instant determination. Instead of 2,000,000 or 50,000 similar cases it appears from the record that its policy decision in this appeal concerning the diversion of water from one river to another is *sui generis*. Reversing DER's policy here will necessitate processing but two permits; if it is correct (as DER argues) that its staff already has done the review work necessary to support an NPDES permit, the processing of these permits should impose no considerable burden.

In sum, the factors giving rise to great deference to the administrative decision in *NWF, supra* simply are not present here. Although the appellants have the burden of showing that DER's decision not to require an NPDES permit was an abuse of discretion, we should examine this issue without special reliance on DER's legal analysis stemming from the *NWF* holding. So doing, for reason amplified in the immediately following subsection, we conclude that the proposed discharges into the North Branch and the East Branch are potential "additions of pollutants" to those streams, requiring NPDES permits. Therefore we are remanding the permits to DER for the addition of conditions ensuing that no discharges under the project will occur unless and until NPDES permits have been obtained and are complied with.

In so ruling we are rejecting the appellants' arguments that the NPDES permits should have been secured before (or at least simultaneously with) the issuance of the permits which are the subjects of the instant appeals. 25 Pa. Code §92.21 requires persons "wishing to commence discharges of pollutants" to file an NPDES application within 180 days of the date when the discharge is expected to commence, unless exceptional circumstances receive a longer lead term. Even at this late date in these prolonged appeals, discharges are not expected to

begin within 180 days from now. The circumstances of this controversy are exeptional, unique even, but we do not see that they demand overturning the permit grants solely because NPDES permits have not yet been secured. It can be argued that the first prong of the *Payne v. Kassab* test for compliance with Article I Section 27 of the Pennsylvania Constitution (*Payne v. Kassab*, 11 Pa. Cmwlth. 24, 312 A.2d 86 (1973)) implies DER should have issued the NPDES permit (which we now have ruled is required) before the permits appealed-from were issued. However, the EQB presumably was aware of *Payne v. Kassab* when it promulgated 25 Pa. Code §92.21. The EQB could have required that an NPDES permit for a discharge be obtained before the construction permits which would produce the discharge are granted; instead the EHB merely required that an NPDES permit be obtained within 180 days of the date when the discharge is expected to commence. We agree with the EQB that 25 Pa. Code §92.21 suffices to protect the environment in a fashion fully consistent with the requirements of Article I Section 27 and the intent of *Payne v. Kassab*. Article I Section 27 does not force us to overturn the appealed-from permits, provided we can ensure (as we have) that the NPDES requirements of the applicable Federal Clean Water Act will be complied with before any discharges occur.

4. Why An NPDES Permit Is Needed

Once we have concluded that we need not defer to DER's legal analysis in this matter (including DER's reliance on *NWF, supra*), the further conclusion that we must require an NPDES permit under the facts of this appeal seems unavoidable. The record demonstrates that the Delaware River water which would be diverted into the East Branch and the North Branch contains heavy metals (including lead), phosphorus, nitrates and fecal coliform. Clearly, these substances come under some (or all) of the phrases "chemical wastes", "biological

wastes", "industrial, municipal and agricultural wastes" which are "pollutants" as defined by the Clean Water Act.

Of course, it may be these substances occur in such small amounts in the Delaware River water that no treatment will be required before discharging into the East Branch or North Branch, but this is the very question which the NPDES permit process is designed to answer. Moreover, it is already apparent, from the evidence at hand, that the levels of lead in the Delaware simply cannot be dismissed as "very small" without further careful examination. To ascertain the Delaware River's water quality, Charles Rehm, Chief of the Water Quality Planning Section of DER's Norristown Office, reviewed water quality data submitted by NWRA's consultants as well as certain STORET data (computer print-outs of water quality analyses conducted in the Delaware by various water quality control agencies in the ordinary course of their duties). Mr. Rehm chose to rely upon data gathered at the Morrisville (PA) gauge (which being essentially across the Delaware from Trenton (NJ) is located about fifteen miles downstream from Point Pleasant) because there had been substantial sampling at this location and he assumed that Morrisville water quality was representative of Point Pleasant water quality. In a chart prepared by Mr. Rehm and introduced as a Del-Aware exhibit, Mr. Rehm compared the long-term average concentrations of various water quality parameters at Morrisville to these same parameters in *inter alia* the North Branch and the East Branch. Mr. Rehm determined that the long-term average concentration for the heavy metal lead in the Delaware was 51.4 mg/l (micrograms per liter).

Mr. Rehm acknowledged that this number exceeded the instream water quality standard of 50 mg/l set in 25 Pa. Code Chapter 93 of DER's regulations, but he felt that introduction of this water into the East Branch and the North Branch was nevertheless permitted because this lead value represented only a "small increase" over the Chapter 93 standard. However, Mr. Rehm's position

ignores the plain mandate of law. Where a regulation establishes a definite numerical standard, DER may not decide that some violations of that standard are so small as to be "de minimis". *Commonwealth v. Pa. Liquor Control Board*, 471 A.2d 941 (Pa. Cmwlth. 1984). The principle that DER has a mandatory duty not to allow water quality standards to be exceeded is embodied, e.g., in 25 Pa. Code §95.1(a).

Admittedly, if the East Branch had sufficient flow at the point of discharge, a discharge of 51.4 mg/l of lead might not cause a violation of Chapter 93 standards (after dilution by the receiving stream), but this record demonstrates that during low flow periods the Delaware Diversion will constitute virtually the entire flow of the East Branch and North Branch at the points of discharge. In any event, if DER chose to rely on the diluting capabilities of the receiving stream, it should have carried through a load analysis similar to the waste load allocation process set forth in 25 Pa. Code §95.3. Because DER determined no NPDES permit was necessary for the diversions (and because Mr. Rehm was not perturbed by a "little" excess above water quality standards) it did not go through this process.

While we have emphasized Delaware River lead we note that Mr. Rehm's analysis as presented in Del-Aware Exhibit 52 also shows that the average water quality of the Delaware at Morrisville exceeds Chapter 93 standards for aluminum, bacteria, copper and phenol. Furthermore, Mr. Rehm admitted the STORET data showed that water quality in the Delaware at Lumberville (NJ), only two miles downstream from Point Pleasant, manifested the presence of: copper at 9 mg/l--compared to a 5.6 mg/l standard; zinc at 110 mg/l-compared to a 95 mg/l standard; iron at 4700 mg/l--compared to 1500 mg/l and total phosphorus exeeding the chapter 93 standard by 3 times. It is true that Mr. Rehm discounted

the Lumberville data, due to the relatively small number of samples there reported and due to his impression that the Lumberville data could have been influenced by a discharge from a plater on the NJ side. Nevertheless, the totality of Mr. Rehm's testimony hardly can be said to justify Mr. Rehm's conclusion---arrived at without quantitative analysis of present North Branch and East Branch polluted loads and flow rates--that the effects on water quality in the receiving stream would be inconsequential.

Apparently, Mr. Rehm also was influenced by his opinion that the overall water quality in the Delaware equaled or exceeded the present water quality in the receiving streams. However, even assuming arguendo that the present water quality of the East Branch (and/or the North Branch) is poorer than the Delaware River, we do not believe this is relevant to the issue of whether DER may permit Chapter 93 water quality numbers to be exceeded. This battle was fought long ago in Pennsylvania, and long ago it was determined a polluted receiving stream deserved protection so that polluted streams could be reclaimed and restored to an unpolluted condition, 35 P.S. §691.4(3); *Commonwealth of PA v. Gilpin Township*, 52 Pa. Commonwealth Ct. 414, 415 A.2d 1002 (1980); *Commonwealth v. Barnes & Tucker Company*, 9 Pa. Commonwealth Ct. 1, 303 A.2d 544 (1973); rev'd 455 Pa. 392, 319 A.2d 871 (1974).

In other words, the record indicates that the Delaware may be capable of transferring significant concentrations of pollutants to the receiving streams. Thus the only question remaining, before we legitimately can conclude that NPDES permits should be required, is whether the diversion of Delaware River pollutants to the North Branch or East Branch constitutes "an addition of a pollutant" under the Federal Clean Water Act. In view of considerations discussed *supra*, we are to decide this question without particular deference to DER's legal analysis or to the holding of the *NWF* Court, although we certainly

should pay careful attention to the reasoning of DER and the *NWF* Court. We have paid such attention, and simply cannot agree with DER or the *NWF* Court under the facts of the instant appeal. In particular, as we have stresssed earlier, we cannot agree Congress and the Pennsylvania Legislature intended that DER would have no right to establish pollutant concentration limits for discharges of the Delaware into the Neshaminy or the Perkiomen, no matter how polluted the Delaware or how pristine the receiving streams. Therefore we hold that the diversions presently appealed-from do constitute additions of pollutants under the Clean Water Act.

NWRA and PECO argue that any pollutants which may have entered the Delaware River were not introduced by their activities, so that under the Federal Clean Water Act they should not be held responsible for these pollutants. In this regard, NWRA cites *Appalachian Power Company v. Train*, 545 Fed. 2d 1351 (4th Cir. 1976), which held that utilities which remove water from a river for cooling may return the water to the river without removing the pollutants originally present. *Appalachian Power, supra* is distinguishable, however, because it (as did *NWF, supra*) dealt with the return to the same waterway of pollutants removed therefrom; the instant appeal deals with transfer of pollutants from one river into two other rivers. In *Appalachian Power, supra* even more than in *NWF, supra* it could be (and was) argued that the activity of the would-be permittee did not cause the pollution, so that the permittee should not be responsible for this pollution.

That a different situation pertains where man made activities cause pollution occurring in one body of water to reach another body of water is made clear by two Pennsylvania cases which, albeit they arose under state statutes, nevertheless addressed this very issue. In *Harmar Coal Co. v. DER*, 306 A.2d 308, 452 Pa. 77 (1973), a mine operator argued that since he didn't

cause the acid pollution of the water he was pumping from his mine, he didn't have to treat the pumped water when he discharged it into the adjacent surface waters. The Pennsylvania Supreme Court, though willing to concede that Harmar Coal Company had not caused the pollution to the groundwater, held that "but for" the company's activities the pollution would not have reached the surface waters.

The same Court utilized similar reasoning in *Commonwealth v. Barnes & Tucker Coal Company*, 455 Pa. 392, 319 A.2d 871 (1974), which involved the breakout of acid mine drainage from an abandoned coal mine. The trial court in *Barnes & Tucker, supra* had found that much of the acid mine drainage emanating from the closed mine originated in adjacent coal mines, and ran through insufficient interior barriers into the Barnes and Tucker mine before discharging; nevertheless, the Supreme Court had little trouble in assigning liability to treat all the discharged water upon Barnes and Tucker Coal Company. Again, there was no doubt in *Barnes & Tucker, supra*, as there had been none in *Harmar, supra*, that the company held responsible had not caused the pollution of the waters in question; what each company did was cause or permit the transfer of this polluted water to another body of water. That is exactly what PECO and NWRA propose to do in the instant case.

DER and NWRA also argue that DER conducted an analysis and review "as if" a NPDES permit was to be required. Frankly, the Board is at a loss as to how to consider this argument. Certainly, no party has cited any authority for the proposition that DER's efforts constitute substantial compliance with the Federal Clean Water Act; as explained above we feel that full compliance with this Act is mandated by applicable state law, including Article I Section 27 of the Pennsylvania Constitution.

To sum it up, it was an abuse of discretion for DER to have issued the appealed-from permits without requiring that discharges into the receiving streams comply with NPDES permits. This deficiency of DER's actions in issuing the appealed-from permits readily can be remedied by remand to DER, as per our Order *infra*, without any need to wholly overturn the permits already granted.

We add that the conclusion we have reached concerning the need for NPDES permits causes us to wonder about the relevance of the standing issue discussed so extensively *supra* (subsection III B 1). In the past the Board has not been willing to allow an appellant to "act as a private or Commonwealth attorney general, looking over DER's shoulders" as DER enforces its governing statutes and regulations. *Pennsylvania Game Commission v. DER and Ganzer Sand and Gravel*, Docket No. 82-284-G (Opinion and Order, February 3, 1984). For instance, in *Ganzer* we wrote:

> Every allowable Commission claim of procedural or substantive error by DER in granting *Ganzer* its permit must be related to the Commission's alleged injuries under the *William Penn* standard.

Although we certainly do not disavow this holding from *Ganzer*, we question our discretion--in the large and complex water diversion project presently before us--to ignore, solely on grounds of standing, our conclusion from a fully litigated record that an NPDES permit is needed to ensure protection of the North Branch (as explained earlier, standing to appeal the "no NPDES permit" decision for the East Branch has not been challenged). We see no need to rule on this question at this time; the issue will be mooted unless our provisional ruling that Del-Aware has standing to appeal the "no NPDES permit" decision for the North Branch is reversed after reconsideration of this adjudication. The issue will become crucial, however, if our grant of standing to Del-Aware is reversed.

C. ENVIRONMENTAL IMPACTS ON RECEIVING STREAMS

Having decided that the presently appealed permits must be remanded to DER in order that the "no NPDES decision" be remedied, we next turn to the host of additional issues the appellants have raised concerning environmental impacts on the receiving streams. The following discussion of these environmental issues is organized under a set of reasonably sensible and comprehensive subheadings; these subheadings do not include "Water Quality", however, because that subject already has been examined during our analysis of the need for NPDES permits (subsection III B 4).

1. Erosion

One of the most hotly contended items in this complex case was the accelerated erosion which the appellants (under which appellation it now is convenient to include the intervenors, Friends of Branch Creek) asserted would be caused in the headwaters of the East Branch by the diversion of up to 46 million gallons of Delaware River water per day (65 cfs) into that stream. Similar claims of accelerated erosion pertain to the North Branch.

The East Branch of the Perkiomen is a small stream, virtually a rivulet, at the point of discharge.[5] In its median flow of 1.5 cgs, a person could jump across it. The stream channel, carved by higher flows, is itself only 16 feet wide at this point.

From this point near the Elephant Road bridge, the stream meanders northwestward towards the main stem of the Perkiomen. In its upper reaches, the stream is, during normal low flows, a series of pools and riffles. The bottom is loose rock. The banks are cut through silty loam and clay loam soils.

The East Branch is a flashy stream. The large amount of land cleared for farming and the high amount of clay in the soils contribute to rapid run-off after rainfall or thaws of snowfall, causing stream flows to increase quickly

---

5. This description is taken in large measure from the post-hearing brief filed by FBC.

after precipitation and then subside. Sheet and gully erosion from farmland make the high flows fairly turbid. These turbid flows are, in the creek, less erosive than clear water flows, due to the reduced sediment carrying capacity of the water which is already silt-laden.

Erosion does occur, however, at levels of flow that are below floodstage. Photographs produced during the hearings showed bank slumping and slope failure during spring run-off. (Del-Aware Exhibits 98A-C) Portions of the bank collapse into the stream in blocks, or are eroded gradually. Mr. Hershey testified that, in measuring the creek, flows from a single thaw removed a foot of soil from the bank.

Aside from the effects of erosion, which can be corrected by improved land management practices, the water quality of the East Branch headwaters is good.

In the Sellersville-Perkasie area, some six miles downstream from the point of discharge, the East Branch is pooled behind a series of low dams. Below this point, the Sellersville sewage treatment plant discharges wastewater to the stream. Water quality in general is reduced, as other sources add pollutants. The stream is much larger, with increased flows of numerous tributaries. A larger channel and larger flows combine with lower velocities to make this lower section of the East Branch a distinguishably different stream.

Since the maximum diverted flow of 65 cfs is approximately 50 times the median flow of the East Branch at Elephant Road, one's intuitive response is that this diversion must have some substantial impacts on the East Branch. Indeed, there seems to be no real dispute among the parties to the proposition that if one tries to force too much water through a small stream, the course and cross section of that stream will be changed by the removal of erodible materials from the streambanks and bottom. There also is no real dispute that in situations where streambed and bank erosion exceed normal levels, there will be increased

turbidity in the stream, increased deposition of sediment on the stream bottom and negative impacts on the aquatic community in the stream. The North Branch too is a tiny stream at the point of the outlet. It too is a flashy stream meandering through an erodible area, so the discussion relating to the East Branch holds with equal rigor to the North Branch.

The battle is joined, however, as to exactly when soil erosion begins to take place and even (though to a lesser degree) as to the mechanism which causes this problem.

DER's findings and conclusions on this issue, as contained on page 41 of its Environmental Assessment, are as follows:

Increased Flows

> The major effects on the stream flows and stream channel of the East Branch Perkiomen Creek resulting from the addition of waters diverted from the Delaware were investigated in the 1970 report by E. H. Bourquard Associates, Inc. Because of proposed pumping rate changes, another review was made by Philadelphia Electric Company in its Environmental Report (July 1979).
>
> To briefly summarize the findings of these studies, a total of 15 locations were investigated along the 117,000-foot reach between the mouth of the East Branch and Elephant Road bridge. Low, median and flood flows were established at each of these locations for both existing and proposed conditions. In Bourquard's original report, the average rate of pumping Delaware River water into the East Branch was estimated to be 54 cfs. The average rate of pumping in PECO's updated calculations is estimated to be 34 cfs, not including water losses in transmit. The maximum pumping rate used in both reports was 65 cfs.
>
> For purposes of comparison, the channel section closest to the point of in-flow will be discussed. This section is considered the most critical since the cross-sectional area of the channel is the smallest at this point.
>
> During low-flow periods, only a small low-flow channel is required to convey the entire stream flow of approximately 0.05 cfs. Depths of flow are calculated to be 0.02 feet and velocities are 0.17 fps. During maximum pumpage, the flow increases to 65 cfs,

depths to 1.28 feet and velocities approach 3.0 fps. This rate of flow is not considered to be erosive and flows should be contained within existing stream channels.

During periods of median stream flow, existing conditions are such that flows are 1.4 cfs, depths approach 0.15 feet and velocities are calculated at 0.61 fps. With the maximum increased flow of 65 cfs, the depths would increase to 1.3 feet and velocities to 3.02 fps. Again, there should not be any noticable erosion on existing stream banks. (footnotes omitted)

Not surprisingly, appellants and intervenors challenge both DER's findings and the "no erosion" conclusion it draws therefrom. The record indicates that the Bourquard study upon which DER relied was the work product of a civil engineer named Robert Steacy. Although Mr. Steacy, a 1939 graduate of CCNY, has had a long engineering career (which was mostly spent with the U.S.G.S.) and certainly impressed the presiding officer as a competent and honest witness, until the present case Mr. Steacy had not proffered an opinion on expected erosion nor had he predicted future flows in a stream. In the instant matter, Mr. Steacy's predictions were based upon a single site visit to the East Branch, during which Mr. Steacy observed this stream at various points from highway bridges.

Instead of field measurements, Mr. Steacy relied upon calculations of stream velocity using Manning's formula, and compared these calculated values to a table. Both the formula and the table appear in the Handbook of Hydraulics by Brater and King, Sixth Edition.

Manning's forumla ($V= \frac{1.486\ r^{2/3} S^{1/2}}{n}$) estimates the velocity of water flowing past a point in a pipe, channel or stream, as being proportional to positive powers of the sideslope (S) and hydraulic radius (r) of the pipe channel and/or stream, and as inversely proportional to the roughness (n) of the conveying device. The hydraulic radius (r) is a measure of the curvature of the conveying medium, and thus depends upon the manner in which a given flow fits the conveying medium,

i.e., the cross-sectional area over the wetted perimeter equals r. To calculate or measure r, therefore, one must calculate or estimate the average depth of flow and the effective slope of the stream banks. At each of the points where he calculated velocities, Mr. Steacy measured neither the depth nor the slopes of the banks, but rather estimated these dimensions. The expert witnesses proffered by appellants and intervenors challenged Mr. Steacy on both these estimates. Moreover, they challenged the n or roughness value chosen by Mr. Steacy. As to the lack-of-measurement arguments raised by appellants' experts, we agree that it would have been desirable for Mr. Steacy to have measured depth and side slopes for at least one point, and we note with approval that appellants' witness John T. Hershey and his helpers did measure the depth and slopes of the East Branch at certain points; but we must note that these measurements did not take place when the flow in the East Branch was at or near 65 cfs, i.e., during conditions approximating the conditions applicable in the East Branch during maximum diversions.

It seems to us that if one really wants to know how a flow of 65 cfs fits the East Branch channel, one has to measure the channel at that flow. Failing that, the applicants, DER, the appellants, the intervenors and this Board are relegated to discussing theoretical calculations.

The most relevant of such calculations was the 3.02 feet per second velocity calculated by Mr. Steacy for the flow of the East Branch at Elephant Road with a 65 cfs diversion. DER relied on this calculation. Therefore, we will assume for the rest of this discussion that the upper reaches of the East Branch will be subjected to a velocity of 3.02 fps from the proposed diversion. So assuming, the crux question becomes whether this velocity will cause substantial erosion in the East Branch. Several of the witnesses, including Mr. Steacy, testified that there is no sharp line between those velocities which no longer

can maintain silt in motion and thus will lead to sediment settling on the bottom of the East Branch, and those velocities which will scour the banks and bed of the East Branch. Both of these velocities are considered critical velocities. For our purposes we will examine only the upper critical velocity, the velocity at which scouring begins. In this regard, Dr. Robert Dresnack, a well qualified civil and sanitary engineer proffered by NWRA, agreed that a valid approach for determining critical velocity was to refer to a table appearing on page 7-24 of Brater and King.

It is important to note that this table sets forth permissible velocities in canals after aging. The textual material preceding this table emphasizes that the process of aging--especially by the deposition of a variety of materials from fine to coarse on the sides and bed of a stream, and most especially by the deposition of colloidal materials--tends to cement the clay, silt, sand and gravel along the sides and bed in such a manner as to resist erosive effects. Thus, permissible velocities in aged canals are greater than in newly rolled canals. Several witnesses testified that the East Branch, as a natural stream which already has received substantial runoff from adjacent farmer's fields, resembles an aged canal rather than a new one. We shall make that assumption, but in doing so we note that the Brater and King Table already assumes an aged canal.

The table in question provides as follows:

Permissible Canal Velocities after Aging
Recommended in 1926 by Special Committee on Irrigation Research, ASCE

Original material excavated	Clear water, no detritus	Water transporting colloidal silts	Water transporting non-colloidal silts, sands, gravels, or rock fragments
Fine sand, non-colloidal	1.50	2.50	1.50
Sandy loam, non-colloidal	1.75	2.50	2.00
Silt loam, non-colloidal	2.00	3.00	2.00
Alluvial silts, non-colloidal	2.00	3.50	2.00
Ordinary firm loam	2.50	3.50	2.25
Volcanic ash	2.50	3.50	2.00
Fine gravel	2.50	5.00	3.75
Stiff clay, very colloidal	3.75	5.00	3.00
Graded, loam to cobbles, non-colloidal	3.75	5.00	5.00
Alluvial silts, colloidal	3.75	5.00	3.00
Graded, silt to cobbles, colloidal	4.00	5.50	5.00
Coarse gravel, non-colloidal	4.00	6.00	6.50
Cobbles and shingles	5.00	5.50	6.50
Shales and hardpans	6.00	6.00	5.00

We remark that although the table's recommendations are nearly 50 years old, the possibility that the table now is outdated was not raised during the hearings.

Mr. Steacy selected the value of 3.5 fps as the critical velocity from this table because he assumed that the banks and bed of the East Branch were composed of ordinary firm loam, and because he also assumed that the Delaware River water transferred to the East Branch would be transporting colloidal silts but not sands, gravels or rock fragments.

Both of Mr. Steacy's assumptions were hotly challenged by the appellants and intervenors. As to the type of soil in the banks and bed, the challengers noted that Mr. Steacy's assumption was based upon a visual investigation at certain locations along the East Branch, conducted during his single visit to the site. In spite of the fact that Brater and King noted the importance of properly defining the soil along the line of the waterway before applying the table, neither Mr. Steacy nor anyone else on behalf of PECO, NWRA or DER tested the soils in the vicinity of the East Branch or examined the available literature on this subject.

DER's aquatic biologist, who has examined the entire East Branch more than once, did have an opinion on the type of soil materials adjacent thereto based on visual examination; his opinion, that the substrate was composed of small rocks, boulders, rubble, a lot of silt and a lot of clay seems to be at variance with Mr. Steacy's observations (of ordinary firm loam). A similar analysis of the North Branch substrate was supplied by Paul Hammon--NWRA's aquatic biologist.

The appellants' hydrological witness, Jonathan T. Phillippe, did attempt to objectively determine soil types in and adjacent to the East Branch. One source of the information he used was the soil analysis performed on behalf of NWRA for construction of the Bradshaw Reservoir. This analysis showed the soils at the Bradshaw site to be predominately silty or sandy clay loams.

The Applicants' experts disparaged this analysis, and pointed out accurately enough that the proposed Bradshaw Reservoir was at least 6 miles away from the outlet on the East Branch. However, Mr. Steacy also didn't like the results of an analysis of borehole materials even though the borehole in question was in the bank of the East Branch.[6]

Mr. Steacy also rejected the analysis of soils contained in the Bucks County Soils Conservation Map for the East Branch area. This analysis, like the Bradshaw Reservoir and borehole analysis, supported the appellants' view that soils in and near the East Branch are more properly grouped in the silt loam, non-colloidal category than in the firm loam category. The Soils Conservation Map is a carefully prepared document. All in all, therefore, though recognizing that the appellants have the burden of proof, we find, for purposes of this Adjudication, that the soils in the vicinity of the East Branch fall under the silt loam non-colloidal category. Both Dr. Dresnack and Mr. Steacy admitted that if the soils were of the latter type the critical velocity would be 3.00 fps even assuming that the Delaware River water transported mainly colloidal silts, and would be 2.00 fps if this diverted water were considered to be either clear or containing silts, sands, gravels and rock fragments.

On the crucial issue of the quality of the diverted Delaware River water, there is again, not surprisingly, a split of opinion between appellants and Applicants' experts. Again the opinions are mostly subjective. Appellants' experts suggest that the Delaware at Point Pleasant is not greatly silt laden in the first instance, and that storage in Bradshaw Reservoir will cause much of the silt in the Delaware to settle out. The Applicants' experts argue that the Delaware River water is laden with colloidal solids, and also argue that these

---

6. This analysis showed the presence of hard silt, little shale or gravel, and little clay.

solids will not settle out during the two days the Delaware water will be stored in the Bradshaw Reservoir before being released to the East Branch.

The only scientific attempt to predict the amount and nature of solids to be expected in Delaware River water was conducted by Dr. Dresnack. Dr. Dresnack reviewed water quality analyses of Delaware River water; he inferred that a large percentage of the solids in the Delaware must be colloidal because they are not suspended solids. Accepting this inference, which was contested by appellants' counsel but not contradicted by evidence, Dr. Dresnack's further analysis seems to undercut his ultimate conclusion. Essentially, Dr. Dresnack's further analysis of the Delaware River's behavior over 6 calendar years demonstrated that most of the sediment carried by the Delaware is associated with high water levels; for instance, 50% of the yearly sediment load is transported during only six days. The corollary of this analysis, as is plain from Dr. Dresnack's exhibits, is that during the warm weather-lower flow periods when the highest diversions are contemplated, little sediment (colloidal or otherwise) will be transported by the Delaware. Therefore, we find that the water to be diverted to the East Branch will be clear water. Accordingly, along with our finding on soils types, we find from the above Table and in accordance with the testimony of appellants' experts that the critical velocity in the East Branch will be 2.0 fps.

We note that Applicants' experts expounded an alternative theory to demonstrate that erosion in the East Branch will be minimal. They testified that since even the maximum diversion will not approximate the 1.5 year flow of the East Branch, and since the 1.5 year flow (the so called "bank full" flow) is the dominant flow for cutting the channel, no excessive erosion can be expected. While this testimony does alleviate the Board's concerns about possible flooding from the diversion, neither the Brater and King text nor the ASCE Manual of Practice No. 54--which sets forth a similar table (Table 5.2)--requires bank full

conditions as a precondition to erosion; critical velocity alone is the mechanism discussed in these sources (which sources were authenticated and used by all parties' experts). Thus the Board concludes that if and when flows in the East Branch exceed 2.0 fps in its upper reaches, substantial erosion of the bed and bank facing the wetted perimeter of the stream occurs.

The above discussion has been restricted to the East Branch. It holds with equal force to the North Branch of the Neshaminy. The same clear Delaware River water is proposed to be discharged into each stream. The North Branch is much closer to the Bradshaw site than is the East Branch, so that the Bradshaw soil analysis applies with even more force to the North Branch. NWRA's own expert, Paul Harmon, on the basis of considerable on-site observation, concluded that this stream's substrate was a "fairly erodible" mixture of "gravel, rubble and Bowmansville silt".

Consequently for the North Branch as for the East Branch we conclude that 2.0 fps is the critical velocity.

Since NWRA's own engineering expert, Dr. Dresnack, has calculated a maximum velocity at full diversion of 2.2 fps in the North Branch, here too the Applicants' own expert has predicted an instream flow which exceeds the velocity we've found to be critical.

What to do about this situation? DER's response to the potential for erosion in each creek was to condition each permit, so that each permittee had to: (1) monitor and inspect the portion of its respective creek adjacent to and below the outlet structure on a regular basis; (2) correct any observed erosion on the bed; and (3) stabilize and revegetate any exposed portion of the stream bank.

The appellants are not satisfied with these conditions and rightfully so. The permit conditions, described above, at best address the erosion problem

after it is created. It is the genius of the permitting process to anticipate and prevent environmental problems before they arise. Moreover, the above conditions provide neither the permittees, nor DER nor interested third parties with any verifiable standard.

The DER official in charge of this project, R. Timothy Weston, albeit by way of a legal opinion, admitted that erosive velocities caused by an outlet permitted under 25 Pa. Code Chapter 105 would have to be mitigated in order to comply with 25 Pa. Code §§105.14-16 (as well as with Article I, Section 27 of the Pennsylvania Constitution). We agree with Mr. Weston's legal analysis in this regard. In *Payne v. Kassab*, 11 Pa. Commonwealth Ct. 14, 312 A.2d 86 (1973), the Commonwealth Court promulgated a three prong test to review the compliance of an agency or instrumentability of the Commonwealth with its duties as a trustee of Pennsylvania's Public Natural Resources as per Article I, Section 27 of Pennsylvania's Constitution. This threefold standard is:

> (1) Was there compliance with all applicable statutes and regulations relevant to the protection of the Commonwealth's public natural resources? (2) Does the record demonstrate a reasonable effort to reduce the environmental incursion to a minimum? (3) Does the environmental harm which will result from the challenged decision or action so clearly outweigh the benefits to be derived therefrom that to proceed further would be an abuse of discretion?

This standard has been uniformly applied by this Board and Commonwealth Court when reviewing actions of DER, *Concerned Citizens for Orderly Progress v. DER*, 36 Pa. Commonwealth Ct. 192, 387 A.2d 989 (1978).

Particularly relevant to DER's obligations under the second prong of the *Payne* test is 25 Pa. Code §105.16(a) of DER's regulations, which provides:

> The determination of whether the potential for significant environmental harm exists will be made by the Department after consultation with the applicant and other concerned governmental agencies. If the Department determines that there may be a significant impact on natural, scenic, historic, or aesthetic

values of the environment, the Department will consult with the applicant to examine ways to reduce the environmental harm to a minimum.

We are not unmindful that it might be impossible for PECO or NWRA to achieve the critical velocity of 2.0 fps into the East Branch and North Branch, respectively, i.e., to reduce the impact on these streams to an insignificant level. In this event, we believe that under the third prong of the *Payne v. Kassab* test it is incumbent upon DER to balance the need for the project against the impact of erosion on the receiving streams, after all possible mitigation of the erosive impacts. Indeed, this conclusion is merely a paraphrase of the testimony of R. Timothy Weston, Esquire (Tr. p. 2495), the DER official most intimately connected with the Point Pleasant project.

Since, as per our earlier discussion, we already are remanding this matter to DER, it will have the opportunity to conduct this balancing analysis during remand.

2. Flooding

The appellants also raised concerns about the possibility of flooding in the East Branch caused by the discharge. On this point DER, at page 42 of its Environmental Assessment, set forth the following:

> To analyze the effects on flood flows, the following table was prepared for this inflow point utilizing data from Tables 2 and 3 in PECO's 1979 Environmental Report.

Table 4

	Q(cfs)	Depth (feet)	Velocity (fps)
Median Flow	1.4	0.15	0.61
Median Flow + Point Pleasant Diversion	66.4	1.30	3.02
Mean Annual Flood	320.0	2.6	5.1
5 - Year Flood	467.0	3.2	5.7
50 - Year Flood	960.0	4.1	6.6

> As noted above, the addition of the 65 cfs to the median flows does not place the stream in a mean annual flood condition.
>
> The operating plan for the project requires PECO to monitor stream flows of the East Branch and, with the

advent of a flood on that stream, reduce or terminate pumpages from Bradshaw Reservoir. When the stream flow of the East Branch approaches potential flood levels (238 cfs at the Bucks Road Gaging Station which is the peak flow of a one-year flood), an alarm is automatically activated at the pumping control center and the Bradshaw pumps, if operating, shall be stopped.

The data in this table were sponsored by several of the applicants' witnesses and were subject only to a narrow attack by the appellants.

Essentially, the appellants admitted that during steady state conditions the addition of 65 cfs to the East Branch would not cause this stream to overtop its banks. However, the appellants demonstrated that because the Bucks Road Gauging Station will be downstream from the diversion point at Elephant Road, a heavy localized rainstorm could cause the East Branch to be overtopped below Elephant Road before the Bucks Road Station read 238 cfs.

Applicants counter this argument not by denying its factual basis, but by asserting that the diversion system can be operated satisfactorily if the flow from Bradshaw Reservoir is shut off when the Bucks Road Gauge reads 125 cfs rather than 238 cfs. Applicants point out that, due to the topography of the Bradshaw to East Branch diversion pipeline, only about half of the water in this pipeline will reach the East Branch after the reservoir discharge is terminated (half of the pipeline runs up-hill). Applicants further assert that this cutoff can be effected in 10 minutes. Neither of these assertions were contradicted by the challengers.

We therefore conclude that if PECO's permit is conditioned to call forth a cutoff at and when the Bucks Road gauge reads 125 cfs, no flooding of the East Branch will be expected.

With regard to the North Branch, here too the undisputed evidence demonstrated that the addition of even a full diversion (of 160 cfs) to the

median flow of 1.34 would not cause flow therein to exceed the mean annual flow in the North Branch of 280 cfs. Challengers did not dispute this evidence and, unlike the situation on the East Branch, offered no evidence of even short-term flooding problems which would be exacerbated by the diversion.

3. Wetlands

Appellants raised an issue concerning the adverse impact on wetlands adjacent to the East Branch caused by the diversion. Appellants' evidence on this issue consisted in large part of testimony based upon a poorly scaled Bucks County map and other unidentified maps, from which challengers' witness John Hershey calculated that as much as 100 acres of wetland would be affected. Setting aside the question of whether the wetlands identified in this map are "important wetlands" as used in 25 Pa. Code §105.17 (see section III D 2 *infra*), there is no evidence that the diversion would cause any wetlands to be inundated. Absent such evidence we cannot call DER remiss in failing to additionally condition the permits in question to protect these wetlands. The small amount of wetlands adjacent the Delaware which would be affected by the project are discussed below.

4. Aquatic Biota

Considerable testimony in this matter addressed the present state of the aquatic communities in the East Branch and the North Branch as well as the projected impacts on these communities from the proposed diversions. DER's aquatic biologist, Donald Knorr, testified that the aquatic community in the upper reaches of the East Branch, just below the proposed discharge point, was typical of streams that experience dry periods and also experience agricultural runoff. He admitted, in response to a hypothetical question, that if the East Branch were subject to continued high levels of turbidity over a long period of time (as throughout a summer), the aquatic community therein could be damaged.

However, absent excessive and long lasting erosion, Mr. Knorr predicted that the diversion would actually improve the environment for the aquatic community in the East Branch by increasing the habitat available to this community. Whereas without the diversion the upper reach of the East Branch "dries up" in the summer leaving only isolated pool areas, the diversion would insure a year round supply of moving and oxygenated water.

Applicants' aquatic biologist, Paul Harmon, who has studied the aquatic biology in the East Branch for the last 12 years, agreed with Mr. Knorr on both of the above points. The appellants did not introduce any evidence to contradict the above witnesses, and in general narrowed their concerns on aquatic biology to the erosional effects discussed above. Since we have found that imposing a 2.0 fps limit on velocity in the East Branch will reduce accelerated erosion caused by the diversion to minimal levels, we also find that imposing this velocity limit will eliminate any undue stress on the East Branch aquatic community.

Although it is not so clear from the record that the appellants even questioned the impacts of diversion upon the aquatic community in the North Branch, we find that since the same limitation will appear in NWRA's permit as in PECO's, the North Branch's aquatic community should be equally protected.

D. DELAWARE RIVER IMPACTS

As described in more detail above, the intake structure for the Point Pleasant Project is to be located on the west bank of the Delaware River near the southern boundary of the Village of Point Pleasant, Plumstead Township, Bucks County. The intake structure itself will consist of an assembly of 24 Johnston wedge wire screens which are to be located approximately 245 feet streamward of the Pennsylvania bank of the Delaware River. The screens, each of which is 40 inches in diameter, will be grouped in 3 groups of 8 each and

will be connected by a 72-inch diameter reinforced concrete pipe to a gate well located along the bank. Each grouping of screens and connecting pipe comprises a cylinder, whose long axis is aligned with the Delaware River's main axis.

These cylinders are to be supported some two feet above the Delaware's floor and some four feet below the river surface at low flows. From the gate well, a buried 72-inch diameter reinforced concrete pipe will pass under the Delaware Canal to a pump station located on the Delaware's bank east of the Delaware Canal (Roosevelt State Park).

The pump station is to be 80 feet long and will stand 45 feet above finished grade. The grade of the station is below that of the tow path along the Delaware Canal, but the roof of the station will be at least 15 feet above the Delaware Canal. The station, which is to be constructed of reinforced concrete, is designed to resemble a barn. Behind the pump station (facing the canal) an electric substation protected by a chain fence is to be located, the fence approaching within 30 feet of the canal, and the substation and fence being clearly visible therefrom.

1. Impacts on Local Fishing

Appellants raised concerns about the effects of installation and operation of the intake on the local aquatic ecology. The only effects of the intake to be considered here are the operational impacts.

For purposes of this section of this Adjudication the inquiry will be further limited to the impact of the structure on local fishing. In this regard, appellants raised concerns that the intake structure could pose a physical hazard to fishermen fishing in this area from boats or inner tubes, that its presence could cause the shad to veer away from the Pennsylvania shore, and that it would adversely impact local fish populations through the entrainment and impingement of fish eggs and larvae.

In order to better comprehend each of these issues it is desirable to know that the proposed intake structure is to be located approximately 800 feet downstream from the point where the Tohickon Creek enters the Delaware. Over the years the Tohickon has created a bar or thumb of land which is about 800 feet in length and extends perhaps 100 feet streamward from the Pennsylvania shore. At Delaware River flows of 6000 cfs this bar becomes overtopped and no longer influences the surface flow of the Delaware, but at lower flows the bar begins to emerge from the Delaware and its emergence causes an eddy to form downstream. The size and shape of this eddy changes with changes in Delaware River flow. Lower flows cause the eddy to lose strength, but also to extend further out into the Delaware River.

The testimony in this matter and even the exhibits introduced by Del-Aware (see especially Del-Aware Exhibit 23C) demonstrate that the intake structure is usually located out of the eddy and to the New Jersey side of the eddy wall.

At certain flows, however, it appears that the intake structure may be in contact with the eddy wall. (The record demonstrates that the eddy is a favored fishing spot for typical warm water fish such as bass, as well as a popular fishing spot during the annual run of the American Shad.)

Due to the uncontradicted facts: (1) that the intake structure will be located at least four feet below the Delaware River's surface and (2) that even at full diversion the intake velocity will be very low (.011 fps) at a distance of even one foot from the intake's screen, so as to be imperceptible at the Delaware's surface, we can find no physical danger posed to fishermen passing even directly over the screen in a boat or inner tube. Certainly, the appellants introduced no evidence which even began to indicate any such danger. Our finding mercifully makes it unnecessary to examine the appellants' standing to raise this "danger to fishermen" issue.

As to the impact on shad fishing, Mr. Kaufmann of the Pennsylvania Fish Commission did testify that American Shad, being shy of shadows, would not pass under the intake structure on sunny days when the structure cast a shadow on the Delaware's bed. Further, Mr. Kaufmann expressed concern that in veering away from the shadow the shad could veer towards the New Jersey shore, and thus diminish fishing from the Pennsylvania shore. On the other hand, Mr. Kaufmann admitted that it was just as likely that the shad would veer towards Pennsylvania and thus improve Pennsylvania fishing. The possibility of a split flow of shad was not discussed nor was the question of how seriously a structure located 245 feet from shore would affect a fisherman casting from the shore. In short, Mr. Kaufmann's testimony, while credible, does not support a finding that the intake structure will harm fishing by its mere existence.

The appellants also expressed concern that the eggs and larvae of American shad and the shortnose sturgeon could be sucked through the screening (entrained) or held fast thereto (entrapped) by the suction through the intake screens. The record again does not validate this concern. Even the appellants' witnesses agree that the proposed Johnston wedgewire screen is the state of the art in water intake technology. This screening, with its 2 mm. openings, is smaller than the size of a water-hardened sturgeon or shad egg, and thus cannot entrain either of these. Moreover, the zone of influence of these screens even at maximum i take velocity is very small. The maximum intake velocity at the screen is only .5 fps and this velocity drops to .011 fps at five feet from the screen; even Del-Aware's ichthyological witness agreed that the influence of the intake velocity would extend only 2 inches from the screen.

When we further consider that a single shad female lays an estimated 100,000 to 500,000 eggs, that less than 1 percent of these eggs would hatch even under normal circumstances, that these eggs will be no more likely to pass

the intake structure than any other point of the Delaware, that there is no evidence that the shortnosed sturgeon even inhabits the Point Pleasant area, and that no more than 2 percent of shad eggs passing Point Pleasant could conceivably be affected by the intake, we cannot help but conclude that the intake's operation will not adversely impact the aquatic community of the Delaware River at Point Pleasant.

2. Archeology and Wetlands

Turning to the pumphouse, here the issues raised concern the alleged impacts of this pumphouse on: (1) the historic and scenic integrity of the Roosevelt State Park; and (2) a valuable archeological site located on the land acquired for the pumphouse. The appellants also expressed concern about the effects of the pumphouse construction on wetlands adjacent to the Delaware.

According to the testimony of Del-Aware's witness, Samuel Landis, the entire Point Pleasant area, and especially that portion of this area contiguous to the Delaware River, was a gathering place for Indians. It is not surprising, therefore, that an archeologically stratified site exists in that portion of the Point Pleasant project site lying between the canal and the Delaware River. This archeologic site, which has a surface area of approximately 75 square feet, was discovered by a team of archeological consultants hired by NWRA, including Del-Aware's archeological witness. This witness had no complaints about the methods used by the said consultants in surveying and identifying the site in question for significant archeological resources, nor did he disagree that the small site identified was the only such site on the project property. He even agreed, in general, with the methods used by NWRA to protect this area, e.g., avoiding the archeological site during construction, covering it with earth and covering the area with plastic. It is true that Mr. Landis also would have the archeologically sensitive area fenced off, but when the measures undertaken to

protect this area are compared to the complete lack of safeguards on adjacent private property, it cannot be denied that NWRA has taken all reasonable measures to protect this site. Finally, in this regard, it should be noted that the above-described archeological survey and preservation techniques were required by a Memorandum of Agreement between NWRA, the Advisory Council on Historic Preservation, the Pennsylvania Historic Preservation Officer and the Army Corps of Engineers. The relevant DER personnel had knowledge of this agreement, and relied upon it in concluding that the Point Pleasant Project would not significantly affect any archeologically sensitive resources. Beside the above protections, this agreement requires NWRA to station a competent archeologist on site to monitor the excavations during construction. In the absence of any countervailing argument or evidence we find these protections to be adequate.

The appellants admitted that the Point Pleasant Project would affect .30 acres of wetlands, and agreed that while .22 acres of wetlands would be permanently lost, the remaining .08 acres would be restored to their original grade and pre-construction condition. Even the appellants didn't seriously question the removal of this small amount of wetlands, but rather directed their attention to the wetlands located adjacent to the East Branch. Those wetlands have been discussed above (section III C 3). In the absence of any countervailing evidence (or even argument) from the appellants, and in the presence of testimony that the affected wetlands are typical of the adjacent flood plain forests along the Delaware which will not be affected, the Board can find no fault with DER's determination that the wetlands in question are not "important wetlands" within the meaning of 25 Pa. Code §105.17.

3. Historic, Aesthetic and Scenic Impact

Point Pleasant Village is a very pretty collection of attractive residences set in a scenic area hard adjacent to the Delaware River. Its historic

significance is reflected by its registration as a National Landmark. Moreover, the Delaware Canal, which parallels the Delaware, is one of Pennsylvania's Public Natural Resources, being in fact Pennsylvania's Roosevelt State Park. The pumphouse of the Point Pleasant project, which is described in more detail above, is within plain view from the Delaware Canal and is visible from at least some of the Point Pleasant residences. Further, in order to transport water from the pumphouse to the Bradshaw Reservoir a 72-inch diameter reinforced concrete pipe must cross the Delaware Canal, which will necessitate the temporary closing of a section of the Canal and a right-of-way across state land.

The appellants assert that DER violated its fiduciary duties as a trustee of the Roosevelt State Park by granting a right-of-way across the Canal, and that DER violated the spirit (at least!) of the applicable statute allowing DER to grant rights-of-way across state land.

We were initially perplexed with DER's treatment of the impacts of the pumphouse. It is true that certain officials of DER examined a full set of drawings and artistic renderings showing elevations and landscaping plans for the Point Pleasant pumphouse. But the only reviewing official with any trace of expertise in this area, Mr. John Nuss, asserted that he had not considered the aesthetic or scenic impact of this pumphouse on users of the Roosevelt State Park, because the pumphouse was located outside of the State Park (Tr. 2010-11). Further testimony, however, demonstrated that DER officials also relied upon reviews of the pumphouse by officials of the Pennsylvania Historic and Museum Commission and the Corps of Engineers and the NRC. We think that it is appropriate for an agency to rely upon the expertise of its sister agencies where they are functioning within the scope of their implementing legislation. Indeed, this seems to be the holding of such cases as *Delaware County Community College v. Fox*, 20 Pa. Commonwealth Ct. 335, 342 A.2d 468 (1975). Here, as with regard

to archeological resources, DER relied upon the above-referenced Memorandum of Agreement, which bound NWRA to protect the Point Pleasant Historic District by: (1) submitting designs, plans and specifications for the Point Pleasant Pumping Station and its boundary fencing to the State Historic Preservation Officer; and (2) developing a landscaping plan to minimize the visual impact of the pumping station and the boundary fence, consistent with the area's natural setting.

Again the appellants introduced no evidence, let alone expert evidence, that the above measures are inadequate to minimize the archeological, scenic and historic impacts of the pumphouse. We find, therefore, that they are adequate.

4. Grant of the Right-of-way

Appellants also attack DER's grant of a right-of-way across the canal pursuant to the Administrative Code of 1929, as amended, Section 1926-A. DER agrees with the appellants that §1926-A requires that the easement is not only in the public interest, but that this public interest outweigh any permanent deleterious effect on State land. DER does not agree, however, that DER must make an explicit, prior, finding of paramount public interest before granting an easement. Instead, DER's officials maintained that any necessary findings were made implicitly by the grant of the easement in question. Moreover, DER asserts, and the uncontradicted evidence shows, that the right-of-way will cause no permanent deleterious effect on State land. DER's Wilson Oberdorfer pointed out that there have been dozens, if not hundreds, of breaches in the 60-mile long Delaware Canal, and that neither the historical nor physical integrity of the canal has been undermined by the 127 plus utility crossings.

Again, in the complete absence of any testimony challenging the precautions described by DER's officials, we cannot help but find that DER has mandated all actions necessary to minimize the impact of NWRA's proposed pipeline crossing on the Delaware Canal.

5. Downstream Water Quality Impacts

At its maximum rate of withdrawal, the Point Pleasant pumpstation is projected to withdraw 95 million gallons (mgd) a day of water from the Delaware River at Point Pleasant. Of this total withdrawal, 48.8 mgd is targeted for the NWRA, the remainder being targeted for PECO. While 95 mgd of water seems (and is) a substantial amount of water, this withdrawal represents no more than 5% of the normal low flow of the Delaware at Trenton (3,000 cfs).

The amount of Delaware River flow reaching the Delaware Estuary has important water quality impacts on the Estuary. Because of population density and industrial activity, the Delaware Estuary receives a substantial load of pollutants, which tends to deplete the dissolved oxygen in the Estuary. Historically, as warm weather arises the dissolved oxygen level in the Upper Estuary falls below the level of 4 mg/l; at this point the American Shad no longer will migrate upstream past Philadelphia to their spawning grounds in the Delaware Water Gap area. This dissolved oxygen block is controlled by flow levels and water temperature and is therefore quite variable, both in terms of length along the river and durational extent. All parties agree that the oxygenated Delaware River water reaching the Estuary helps to raise and maintain the dissolved oxygen level in the Estuary, so that the removal of a significant amount of Delaware River water would exacerbate the dissolved oxygen problem.

Fresh Delaware River water also is necessary to keep the tide-affected Delaware Estuary (which is the site of the water intakes of the City of Philadelphia) from becoming too salty. (This latter phenomenon is called salinity intrusion.)

According to the Delaware River Basin Commission (DRBC) the 3,000 cfs flow objective can be maintained by releases from upstream reservoirs during almost all conditions, including drought conditions equal to those prevalent

in the 1930's, but not in a 1960's drought (which has an estimated recurrence of once in 100 to 300 years). If and when the Delaware River flow at Trenton falls below 3,000 cfs, PECO's DRBC Docket precludes PECO from withdrawing water unless an equal amount of water is released from the (yet unbuilt) Merrill Creek Reservoir which is to be located upstream from Point Pleasant on the NJ side. As to the NWRA withdrawal, up to 90% of this water, which will be used as a public water supply in the watersheds of the Delaware and its tributaries, will be returned to the Delaware tributaries (such as the Neshaminy, Pennypack and Wissahickon Creeks and Schuylkill River) as discharge from various sewage treatment plants, and will thus return to the Delaware Estuary.

The impacts on dissolved oxygen levels and salinity intrusion at a 3,000 cfs level (at Trenton) or at any other level, and the likelihood that these other levels will occur, are matters which require scientific analysis, including water quality modelling. The Delaware River Basin Commission has the legal authority, the expertise, and the resources to perform such analysis, and it is customary for DER to rely upon the DRBC to conduct such analysis. The DRBC has studied the impact of the Point Pleasant withdrawal--upon the dissolved oxygen level in, and salinity intrusion into, the Delaware Estuary--in its Level B study (May 1981), as well as in the Final Environmental Assessment (August 1980) for the Point Pleasant Project.

After giving detailed consideration to salinity intrusion and low dissolved oxygen levels associated with low flow periods, DRBC concluded in its Level B Study that "[d]ownstream low flows on the Delaware River would not be significantly affected" by withdrawals at Point Pleasant. Moreover, the DRBC concluded as a result of modelling that even under extreme low flow in the Delaware River (2,780 cfs at Trenton) the dissolved oxygen in zone 2 (from Trenton to Philadelphia) would be reduced by no more than .08 mg/l, and that

further downriver the reduction would be less than .08 mg/l. These reductions were characterized by DER's water quality planning chief, Charles Rehm, as being virtually imperceptible.

Similarly, DRBC and DER concluded that salinity control in the Delaware Estuary would not be exacerbated by withdrawals at Point Pleasant because: (1) salt water from the Delaware Bay is repelled by all flows of fresh water entering the Estuary above River Mile 90; (2) the Schuylkill enters the Delaware Estuary above River Mile 90; (3) 90% of the NWRA withdrawal at Point Pleasant will be returned to the Delaware; (4) PECO withdrawals at Point Pleasant pose no significant concern for salinity when the Delaware flows at Trenton equal or exceed 3,000 cfs; and (5) PECO cannot withdraw water at Point Pleasant below the 3,000 cfs flow level without discharging an equal amount of water into the Delaware (from the Merrill Creek Reservoir). Indeed, DRBC determined and DER concluded that salinity objectives can be met in the Delaware Estuary with releases from existing reservoirs, even during a record drought like that of the mid-1960's, so that even at flows well below 3,000 cfs no substantial saltwater intrusion problems are anticipated.

The appellants' counsel clearly disagreed with some (if not all) of the above conclusions by DER and DRBC, but on this issue, as on others above, the arguments and objections of counsel are not legally sufficient substitutes for evidence. The appellants presented no numerical or scientific evidence on either the dissolved oxygen or the salinity issue (as opposed to the expression of concerns). They, as third party appellants of a permit issuance, bear the burden of proof, 25 Pa. Code §21.101(c)(3); *Czambel, Sr. v. DER*, EHB Docket No. 80-152-G, 1981 EHB 88; *Doris J. Baughman v. DER*, Docket No. 77-180-B, 1979 EHB 1. Thus, in the absence of any evidence on the part of third party appellants, and in view of the presumption of regularity which pertains to actions of admin-

istrative agencies like DER and DRBC (*Warren Sand & Gravel v. DER*, 20 Pa. Commonwealth Ct. 186, 341 A.2d 556 (1975)), we accept the above conclusions of DER and DRBC that the proposed withdrawal will not significantly affect either the dissolved oxygen or salinity levels in the Delaware Estuary.

E. ALTERNATIVES

1. NWRA Alternatives

A considerable portion of the record in this matter was addressed to the discussion of various alternatives to the Point Pleasant Project. DER's discussion of these alternatives is given in its Environmental Assessment, beginning on page 67. We found this discussion of DER's useful, and quote heavily from it in the following pages. We start, as does the Environmental Assessment, with an examination of the water conservation alternatives to the NWRA project.

1a. Water Conservation

The appellants assert that there is no need (or at least no need greater than that which can be addressed by water conservation) for the NWRA part of the project. In this regard DER found that (Environmental Assessment, pp. 23ff):

> Bucks and Montgomery Counties face together a regional water supply problem. For the past three decades, the people of this region have relied on increasingly intense development of groundwater to provide both public and private water supplies. The Department's and the Delaware River Basin Commission's studies in recent years document growing problems created by over-reliance on groundwater in the region. The Pennsylvania State Water Plan, Comprehensive Water Quality Management Plan (COWAMP/208), and DRBC Level B Study, as well as several recent water supply cases in Montgomery and Bucks Counties, strongly indicate that intensive public and private groundwater withdrawals in substantial portions of Bucks and Montgomery Counties have oversubscribed or threaten to oversubscribe the resource.
>
> The most recent study of groundwater conditions in the region was completed in 1982. This report, prepared by R. E. Wright Associates, Inc. as part of DRBC's comprehensive groundwater study, refines and confirms the assessments of withdrawal rates and densities, compared to recharge rates for the Triassic aquifers serving the populated areas of Montgomery and Bucks Counties.

Current groundwater withdrawals, especially in the Triassic rock formations, exceed, or threaten soon to exceed, the recharge and safe yield of the groundwater basins upon which a majority of the population relies for supply. Calculations by DER and DRBC indicate that in the Brunswick, Lockatong, and Stockton formations of the Triassic Lowlands, the normal year recharge rates average some 300,000 - 600,000 gallons per day per square mile. However, the region cannot count on every year being "normal". Yet, public and private water supplies must be capable of providing reliable service in all kinds of years.

As noted by R. E. Wright Associates, like annual precipitation, the annual groundwater recharge for a watershed varies from year to year. Using a "normal" year recharge rate as a withdrawal limit for groundwater-management purposes may leave open the possibility that, in a fully developed area, annual groundwater production would exceed annual recharge 50 percent of the time. This could lead to the long-term depletion of the resource, with resulting conflicts among its users. Groundwater may justifiably be more conservatively managed using a lower rate of annual recharge as a guideline for withdrawal.

From a water supply perspective, this area must be especially concerned with dry year recharge rates, rather than normal rates, because of the relatively quick reaction of Triassic formation groundwater to low precipitation. In 1976, for example, a short period of low recharge resulted in substantial drops in groundwater levels, diminishing public water well yields by 30 to 40 percent, while leaving some homeowner wells high and dry.

If previous dry periods were not enough, the drought of 1980-81 clearly dramatized to the people of Bucks and Montgomery Counties the insecurity and vulnerability of their water supply systems.

Rainfall deficiencies began in February and March of 1980 in many areas of eastern Pennsylvania. Problems mounted steadily throughout the year and by February of 1981, 85 public water systems faced severe shortages. Under Emergency Proclamations and Executive Orders issued by the Governor, 44 systems serving over 120 municipalities adopted full rationing plans - mandating cuts in water use by 25 percent or more, and reducing residential allotments to a mere 40 gallons per person per day. Other water systems were forced to turn to emergency supplies, such as quarries, strip mine pits and overland lines from distant streams and lakes, to meet essential needs.

Bucks and Montgomery Counties were among the most severely affected. Eleven public water suppliers in the two county region were forced to impose restrictions on all nonessential

water use. Several municipalities lost wells because of TCE contamination and others faced greatly reduced water levels in their wells.

Dry periods of varying degrees of severity are not an infrequent occurrence in eastern Pennsylvania, and in an area serviced only by a highly subscribed groundwater table the result can be debilitating. In the Triassic formations dry year annual recharge rates are much lower than average year rates. For typical water sheds in the Triassic formations, based on the water budget for the dry year 1966, R. E. Wright Associates calculated annual baseflow/groundwater recharge rates of 146,000 - 331,000 gpd/sq. mi. The R. E. Wright Associates study, confirming the observations of prior reports, found that groundwater production rates exceed 100,000 gpd/sq. mi. throughout much of the Montgomery and Bucks County Area. The Wright study further found that the 1-year-in-10 annual recharge rates to the affected aquifers is exceeded by current groundwater withdrawals over a relatively large portion of Montgomery County, and is generally pervasive throughout the DRBC designated Groundwater Protected Areas.

These withdrawals in excess of recharge result in lowered water tables and groundwater mining, leading to periodic water supply crises, interference with private homeowner wells, and depleted stream flows. Indeed, the imbalanced conditions of groundwater use and reliable supply have led DRBC to designate major portions of Bucks, Montgomery, and Chester Counties as a Groundwater Protected Area, 29 C.F.R., Part 430. Under the Southeastern Pennsylvania Groundwater Protected Area regulations all new or expanded groundwater withdrawals exceeding an average of 10,000 gpd in any 30 day period are subject to permit approval. More careful review is imposed on all applications, requiring detailed pump tests to assess potential impacts on other uses, stream flows and the environment. Conservation programs are required of all groundwater uses. Most important, no new or expanded withdrawals will be permitted by DRBC if, as the result, the total of all withdrawals in a groundwater basin or subbasin would exceed the "withdrawal limit" of the basin or subbasin, based on the recharge rates available during drought years.

The Department in its State Water Plan has recommended that the water suppliers in Bucks and Montgomery Counties that show an existing or projected yield deficit encourage and support water conservation programs among their customers. Even with water conservation, however, supplemental and replacement supplies of water are needed to serve current and future demand in the service area of the Neshaminy Water Supply System.

As part of its evaluation of NWRA's water allocation permit application, DER conducted a detailed review of the public water supply needs in the projected area. In that assessment, the Department found that projections by the State Water Plan, the Delaware Valley Regional Planning Commission, and NWRA all agreed that there is a clear and pressing need for additional and supplemental water in the project area.

Presently, the planned service area of the Neshaminy Water Supply System is served by twenty or more public water systems which depend almost completely on wells as their source of water supply. Many people still depend on private wells. The result of the development of the area is a growing demand for more water just at the time when the existing wells are drying up or losing yield because of declining groundwater tables caused by over-pumping, paving over recharge areas, and the installation of storm and sanitary sewers.

Within the proposed NWRA service area, the State Water Plan projects a drought period yield deficiency by 1990 of 27.5 mgd, which will have to be made up with supplemental water developed from ground or surface water sources. NWRA's projections of yield deficiencies, submitted as part of its water allocation permit request in 1978, are actually slightly lower, projecting a 1990 supplemental water need of 23.1 mgd. By the year 2010, NWRA projects a supplemental or replacement water need of 39.1 mgd. State Water Plan projects indicate this estimate may be conservative.

The Department concurs with the DRBC forecast of supplemental water needs for the Neshaminy Water Supply System, included as part of DRBC Docket No. D-65-76 CP (8) (Figure B). DER finds that the supplemental water needs for the NWRA service area, shown in Table 2, are reasonable in light of current information and plans. The Department reconfirms its conclusion, made as part of the approval of Water Allocation Permit No. WA-0978601, that the allocation of 40 mgd for public water supply needs, for withdrawal at the Chalfont Treatment Plant, is reasonably necessary to provide supplemental and replacement supplies adequate to serve present purposes and future needs in the NWRA service area.

Table 2

Forecast Supplemental Water Needs
Neshaminy Water Supply System

Service Area or Agency	Average Daily, mgd				Maximum Daily, mgd			
	1981	1990	2000	2010	1981	1990	2000	2010
Central Bucks County	2.7	4.9	5.9	7.3	2.7	7.3	8.9	10.9
Central Montgomery County	7.3	10.5	15.7	18.8	7.3	15.8	23.5	28.2
Minimum Flow Releases[1]	3.5	3.5	3.5	3.5	5.3	5.3	5.3	5.3
Water Supply Needs	13.5	18.9	25.1	29.6	15.3	28.4	37.7	44.4
Water Supply Withdrawal[2]	14.9	20.8	27.6	32.6	16.8	31.2	41.5	48.8

(1) Minimum release of 5.3 mgd shall be maintained from 3/1 to 6/15 and 2.73 mgd shall be maintained during the remainder of the year in the Neshaminy Creek.
(2) Includes 10% for water losses in transit.

> The Department is convinced that the citizens of Montgomery and Bucks Counties cannot continue to rely almost exclusively on groundwater for private and public water supplies. A balanced use of surface and ground water sources (otherwise known as "conjunctive management") is necessary to protect all water users in the region. After some 15 years of study by the counties, the Department and the Delaware River Basin Commission, DER has concluded that the Neshaminy Water Supply System including the Point Pleasant Diversion-Chalfont Water Treatment Plant Project is the most viable solution to provide conjunctive management of ground and surface waters capable of serving the citizens of the region.
>
> More detailed information on these needs can be found in the report prepared in conjunction with NWRA's Water Allocation Permit WA-0978601 and the State Water Plan reports for this portion of the State.

The appellants did disclose some inconsistencies in yield deficiencies reported to DER by certain public water supply companies including those relied upon in the development of Table 2 above, and appellants did raise some questions regarding population projections upon which future need was based, but overall the challengers completely failed to negate the weight of the evidence, which

clearly supports a finding that before 1990 (let alone 2010!) there will be a need to supplement groundwater withdrawals as a public water supply source in central Bucks and central Montgomery Counties.

As to the efficiency of water conservation, we note that DER assumed that reasonable water conservation measures would be followed, but that an additional source of public water would still be needed.

> Water Allocation Permit No. WA-0978601 and the Policy and Guidelines for subsidiary allocations require both NWRA and any retail water system receiving water from the Point Pleasant Project to implement conservation measures on a continuous basis. NWRA and the retail systems must submit and implement an adequate program to encourage water conservation by residential, commercial, and industrial customers; and further must implement an adequate, systematic program of monitoring, repair, and preventive maintenance to detect, correct, and where possible, prevent leakage in transmission and distribution lines.
>
> In assessing the need for the project, both DER and DRBC have considered that reasonable water conservation measures and practices will be followed. Without a continuing conservation program, demand in the area to be served would be even higher.
>
> Water conservation is a necessary part of the solution to problems in central Bucks and central Montgomery Counties, but it is not a panacea. The effectiveness of water conservation is limited by the type of residential and commercial uses served by the public water systems in the area. Compared to residential per capita uses in the western United States, which often exceed 300-400 gallons per day per person, total per capita use in the NWRA service area is relatively low (100-130 gpcd). Discretionary water uses, such as lawn watering, are not predominant.

> In order to effect conservation savings, basic changes in water-using appliances, processes and habits must be evolved. Because of water pollution control costs and regulatory requirements, many businesses have already implemented changes in their processes to minimize water use, and further reductions are likely to be more difficult and expensive. Residential uses may be reduced by utilization of low-flow plumbing (toilets, shower heads and faucets). While such conservation plumbing may be implemented readily on new construction, retrofitting of existing homes will take many years. The net conservation effect will not be instantaneous, but will evolve over time.
>
> Finally, the volume of water to be saved via conservation should not be overestimated. Even during severe drought conditions, such as occurred during 1980-81, when people are most sensitive to shortages and the need to conserve, a savings of only 10-15% in average total public water supply use may be achieved. This alone is not enough to solve the Bucks-Montgomery water supply problem.

The appellants introduced some evidence that in individual residences water conservation in excess of 10-15% can be achieved. Indeed, one of appellants' witnesses testified about a completely recycled system which eliminates sewage outflow and drastically reduces water usage. However, appellants introduced no evidence disputing DER's findings which are based upon the aggregate of existing and proposed customers.

DER has summarized its own position on water conservation as follows (Environmental Assessment, p. 67):

> DER has gone on record many times in support of water conservation. Conservation is considered as the first priority alternative for satisfying an existing or projected water supply deficit for all water companies in its State Water Plan. However, the Department realizes that, at best, this alternative offers only a short-term partial solution to the problem.

We believe this statement of DER's represents an accurate evaluation of the actual facts about water needs in the Bucks and Montgomery Counties area. The appellants have not come close to meeting their burden of showing water conservation could be a feasible alternative to NWRA's proposed use of Delaware River water. The Board rejects the suggestion that water conservation is a basis for holding DER abused its discretion in awarding NWRA its permits.

1b. Further Development of Groundwater

Appellants next contended that any additional public water needs could be met by further exploiting groundwater in the area. DER's position on this issue is (Environmental Assessment, p. 69):

> In the absence of a concerted regional effort to develop and distribute surface water supplies, and to effect conjunctive water management, the most likely structural alternative to meet public water supply demands would involve further development of already stressed groundwater resources.
>
> As already noted, DER -- along with most of the other agencies responsible for water management in this region -- believes that this area is already overdependent on groundwater. Clearly, the problems associated with the recent drought illustrate the validity of these concerns. If groundwater is to be managed as a replenishable resource, withdrawals must be brought in line with groundwater recharge. We cannot continue to overdraw this region's groundwater basins without facing the inevitable consequences: lowered water tables, depletion of private residential wells, diminished stream flows (especially in summer), and, in turn, reduced assimilative capacity, higher wastewater treatment requirements and costs, and adverse impacts on aquatic ecosystems.
>
> If anyone doubts the problems associated with overreliance upon, and competition in, development of groundwater, the experience of the past year of drought should be sobering. In 1980 and early 1981, the region endured a period of moderate to serious rainfall shortages, but far less than a record drought condition. Nevertheless,

by March 1981, over 4,000 domestic wells in eastern Pennsylvania had gone dry as a result of this drought event. Four thousand families found themselves without water for essential drinking, sanitation and other domestic uses. The costs of replacing these supplies represented an economic loss of over $6.7 million, borne primarily by these homeowners. The area surely does not need a record drought to make the point more clearly.

Theoretically, it might be possible to serve the more developed portions of Bucks and Montgomery Counties by installing a wide ranging system of wells in the rural areas, with water lines conveying groundwater to the already overpumped communities. Even if economically feasible (which is open to some doubt), for environmental reasons the Department would express serious reservations regarding such a scheme.

In order to develop a well system, yielding 40 mgd public water supply capacity equivalent to the Point Pleasant Project, a large number of wells would have to be dispersed in a pattern which extracts water efficiently, but avoids exceeding the recharge rates of the involved aquifers. Even assuming that normal year recharge rates of 300,000 - 600,000 gallons per day per square mile are the limiting factor, and that no other users were in the area, such a groundwater development project would involve a minimum of one or more wells in each of over 65-130 square miles. Based on water budgets in a dry year, as calculated by R. E. Wright Associates, some 120 to 274 square miles would be required. (To serve the cooling water needs of the Limerick plant, an equivalent well project would be involved.)

Unless such a well system were dispersed far from the existing areas of heavy groundwater use, it could lead merely to further exacerbation of the groundwater mining problem. Groundwater mining can occur whether the withdrawals are made by a few wells, or many dispersed wells; the problem arises whenever the total amount of groundwater withdrawals in an area exceeds the recharge in the area. In portions of the Montgomery and Bucks County region, groundwater withdrawals already approach or exceed recharge rates. The communities immediately adjacent to these areas are developed in large part, and also primarily rely on groundwater through homeowner or public water system wells. Placing additional wells in these nearby communities to serve the existing "groundwater mining" areas is likely to combine with local uses to simply spread the "mining" areas.

The R. E. Wright Associates groundwater study plotted the density of current groundwater uses in the area. Based on the use densities and recharge rates of local aquifers, in order to avoid interference with neighboring uses, a supplemental well system to serve the needs of the Lansdale, Hatfield, Warrington and Warminister areas would have to be sited at least 6 to 10 miles from those communities, in undeveloped areas or in less developed portions of other municipalities and other water companies.

Placing a system of wells in more remote rural areas would naturally involve installing an extensive series of water transmission lines through now undeveloped lands. But placing a widespread network of water lines in rural areas would provide an attraction for suburban development in those rural areas, most likely leading to the same groundwater overuse problems now being experienced.

Even if a dispersed well system did not lead to groundwater mining, it is likely to create problems of local interference with homeowner wells. Most homeowner and farm wells in rural areas of this region are relatively shallow (from 50 to around 200 feet deep). New wells developed to serve subdivisions or community water supply systems are likely to be deeper and more powerful than the typical homeowner well. As seen in a series of recent cases in Montgomery, Bucks, Chester and Lehigh Counties, such development may create cones of influence which draw down water tables in nearby shallow wells, causing interference and/or total depletion. The more groundwater is relied upon as the almost sole source of supply, the more prevalent these problems are likely to become.

The Department is equally disturbed by the prospect that dispersed well development would tend to attract and encourage a checkerboard of subdivision developments, with attendant adverse environmental, social and economic impacts. The most likely sites for supplemental well fields to serve central Bucks and Montgomery Counties fall within areas of prime farm lands. Both counties and the Commonwealth have expressed policies to protect and conserve these valuable soil and land resources. Encouraging more groundwater development in rural areas as a solution to water shortage problems would tend to undermine these prime farmland protection policies.

Thus, as an alternative solution, further development of the groundwater is unsatisfactory from many perspectives, and the Department finds it an unacceptable option for this region.

The only issue raised by appellants regarding this alternative was the possibility of locating public water supply wells in remote rural areas to supplement existing groundwater withdrawals. DER, in the section of the Environmental Assessment quoted above, has addressed this concern. In the opinion of this Board DER has satisfactorily explained why the rural well solution is not an appropriate alternative.

1c. Utilization of Lake Galena

The next alternative to be analyzed is the use of Lake Galena. DER's assessment of this alternative follows (Environmental Assessment, p. 71):

> Proposals have been made that the storage of Lake Galena (PA-617) alone be used to supply public water supply needs, without augmentation by waters diverted from the Delaware River.
>
> Lake Galena was designed incorporating a long term water supply storage capacity of 5000 acre feet (1.63 billion gallons). The gross yield of this storage in a drought of record would be 9 mgd. Accounting for the minimum continuous conservation release of 1.5 mgd required to protect downstream areas on the North Branch Neshaminy, the net yield of Lake Galena is 7.5 mgd. It is assumed this water would be picked up at Chalfont, treated and distributed under arrangements and conditions similar to those contemplated by the proposed Point Pleasant-Chalfont project. Reservoir storage combined with the natural flow of Pine Run and the North Branch Neshaminy, would yield approximately 8.5 mgd at Chalfont.
>
> As noted previously in part 3.A. of this report, the supplemental average daily water needs in Central Bucks and Central Montgomery Counties totalled 14.9 mgd in 1981, and are expected to rise to 20.8 mgd by 1990. Lake Galena alone could not serve the public water supply demands contemplated within the service area of the Neshaminy Water Supply System.
>
> The storage yield of Lake Galena might serve a portion of the NWRA service area, or (as contemplated by the proposed project) serve a portion of needs in the entire service area. Considering the minimum flow requirements in the North Branch Neshaminy below Chalfont (averaging 3.5 mgd), Lake Galena alone would barely meet the 1981 needs of Central Bucks County (2.7 mgd + 3.5 mgd, or a total of 6.2 mgd). By 1990, the projected average daily supplemental water supply demand of 4.9 mgd in just Central Bucks County, coupled

with the required flow rates below Chalfont - totalling 8.4 mdg - would exceed the net yield of Lake Galena and just barely be covered by the combined yield of the reservoir storage and natural stream flows. The combined yield of Pine Run and the North Branch Neshaminy watersheds (including Lake Galena storage) would clearly be inadequate to serve Central Bucks County needs beyond the year 2000.

Use of Lake Galena alone, without the Point Pleasant Project, would engineer addtional drawdowns of lake levels and fluctuations of pool elevations, especially through summer months. Certain recreation uses at Peace Valley Park would be sacrificed to meet water supply demands, and fish spawning areas in Lake Galena would be eliminated.

Because of the inadequacy of Lake Galena to meet the public water supply demands of the Neshaminy Water Supply System service area, the impacts and costs of this alternative must be considered in conjunction with one or more other projects required to address the entire regional water supply problem.

The appellants did not deny the inadequacy of Lake Galena, alone, to supply even the near future needs of Central Bucks and Montgomery Counties. Appellants did urge that Lake Galena should be used along with other sources of water to supply these needs. As NWRA points out, however, Lake Galena's capacity along with that of Pine Run will be utilized in the presently designed project. We cannot agree that the possibility of using Lake Galena's water shows DER's issuance of the NWRA permits was an abuse of discretion.

ld. Utilization of Lake Nockamixon

Use of Lake Nockamixon as an alternaitve to the instant NWRA project also has been proposed. On this subject DER writes:

> Suggestions have been made that a direct withdrawal from the State-owned Lake Nockamixon be used in lieu of a diversion at Point Pleasant, as the source for the NWRA water supply system. Since the Department of Environmental Resources constructed and operates this facility, it has some knowledge and views regarding this option.

When the Department constructed Nockamixon Reservoir, storage was included in the reservoir for long-term future water supply needs. However, DER developed the project with the understanding and plan that it would be operated as a single purpose recreation facility until at least the year 2000, before any water supply would be utilized. Under this assumption, the recreational facilities along the lake were designed to accommodate a five-foot drawdown, which is only slightly greater than the normal drawdown resulting from low flow releases and evaporation. Any water supply usage would cause much greater drawdowns, necessitating the redesign and modification of these facilities, in addition to substantially reducing the recreational usefulness of the lake. In light of the fact that Lake Nockamixon and the surrounding State park provide a major regional recreational resource, which is heavily used by citizens of the five-county metropolitan area, DER would be extremely reluctant to reduce its recreational capacity at this time in order to allow water supply usage, unless no other feasible, cost-effective alternative for public water supply were available.

Even if Lake Nockamixon were to be utilized for public water supply, a direct diversion from the reservoir would not be the most efficient mode of operation. It would be preferable to use Lake Nockamixon in conjunction with a downstream diversion on the Delaware, such as the proposed Point Pleasant withdrawal. In this mode, moderate to high flows on the Delaware could support public water supply for most of the year, while the available storage in Nockamixon is saved to augment available flows during dry periods. In contrast with a direct reservoir tap, which draws on storage all the time, a river withdrawal-reservoir augmentation arrangement would greatly enhance the yield from Lake Nockamixon and allow more water to be made available when it is most needed.

There is an additional disadvantage to a direct tap-off of Lake Nockamixon. Such a withdrawal would make the NWRA system heavily reliant on continuous operation of the Lake. However, it is probable that at several points over the life of the facility, the Lake will have to be drawndown for inspection and perhaps maintenance and repairs. It would be extremely hard to take the reservoir out of service for maintenance if it were to become the direct and sole, or primary, water source for the entire NWRA system.

In summary, DER cannot endorse the use of Nockamixon Reservoir for public water supply at this time. It is serving a large public demand for recreation, while providing some backup insurance for drought protection to the Delaware Estuary. In addition, the Department notes that special legislative authority would be needed for DER to sell water from Nockamixon or any other State-owned reservoirs.

The appellants argued that if Lake Nockamixon can be used during drought to augment Delaware River flow, why can it not be used as a water supply source. DER answered this argument, to the satisfaction of the Board, in the above quoted section of the Environmental Assessment. Appellants also attempted to show that DER had been considering certain releases for Lake Nockamixon to support recreational boating on the Tohickon River. However, the only thing clear about these negotiations is that they did not conclude in any agreement. Also, appellants introduced no testimony showing that Lake Nockamixon could supply all of the water supply needs of Central Bucks and Montgomery Counties. The Lake Nockamixon alternative is rejected.

le. Withdrawals From the Schuylkill River

The withdrawals discussed *supra* were concerned mainly with the water needs of the central Bucks area. The appellants also raised a number of alternatives relating mostly to Montgomery County needs. The first of this latter set of alternatives, namely the use of Schuylkill River water, has been addressed by DER as follows (Environmental Assessment, p. 74):

> Comments have been received suggesting that Montgomery County utilize withdrawals from the Schuylkill River for public water supply, rather than interconnect with the NWRA system.
>
> It must be recognized that Montgomery County has made a good faith effort to develop the resources of the Schuylkill River. Several communities, including Norristown and environs, derive their water supplies directly from the Schuylkill, and others are now using groundwaters of the Schuylkill Basin. Philadelphia Suburban Water Company has intensively developed the Perkiomen Creek watershed, via its Green Lane Reservoir and intakes near the confluence with the Schuylkill River.
>
> In fact, the Schuylkill River is the most intensively used watershed in the entire Commonwealth, and its resources are already used and reused to close to their practical limits. The City of Philadelphia now withdraws an average of 180 mgd from the Schuylkill for municipal water supply. However, the Schuylkill's record seven day average low flow is 200 mgd. The lower Schuylkill is heavily indus-

trialized, while the upper reaches sustain considerable agricultural production. According to State Water Plan assessments, withdrawals in the Schuylkill River watershed today total over 950 mgd. During low flow periods, every drop of water flowing in the Schuylkill River is used five to six times over. Even with modest increases in use, the potential conflicts among agricultural, power, municipal, industrial, and other uses during drought conditions are obvious.

Unfortunately, opportunities for developing further storage in the Schuylkill watershed are extremely limited, due to geology, past mining activities in upper reaches, and the location of communities in several of the technically viable reservoir sites. Both the State Water Plan and the DRBC Level B Study indicate that technical, environmental, economic or social conditions virtually preclude development of significant new surface water storage facilities in the Schuylkill Basin in the foreseeable future.

Because of the already intensive use of the Schuylkill, we must conclude that further significant withdrawals for public water supply would not be the optimal choice to serve regional needs. Such increased use on the Schuylkill would likely lead to further quantity conflicts, and because of the increasing factors of reuse, a further buildup of total dissolved solids and deteriorated water quality.

Little more needs be said concerning this Schuylkill alternative. The appellants completely failed to rebut DER's findings with any testimony. The Board adopts DER's findings (and rejects the appellants' contentions) on this alternative.

1f. Other NWRA Alternatives

Other alternatives--to NWRA use of Delaware water--which have been advanced but have not yet been discussed in this Adjudication include: (1) development of Evansburg Reservoir; (2) import of Susquehanna River water; (3) construction of an independent Montgomery County water supply; and (4) use of the City of Philadelphia's water supply. We see no reason to burden this already excessively long Adjudication with quotations from DER's Environmental Assessment of these alternatives, which bear primarily on Montgomery County needs. Suffice it to say that DER gave serious consideration to these alternatives, and that the appellants offered no credible reasons to disagree with DER's rejections of these alternatives.

Indeed, DER's analysis of the NWRA alternatives went well beyond the legal requirements imposed by DER's regulations and/or Article I Section 27 of the Pennsylvania Constitution. The Board has stated recently (*Coolspring Township v. DER*, Docket No. 81-134-G (Adjudication, August 8, 1983) at 47):

> The Township appears to challenge this conclusion [that there has been compliance with the second prong of the Payne v. Kassab test] with the contention that DER could have found 'other more suitable sites removed from the public'. But the Township cites no authority holding that under the second prong of the Payne v. Kassab standard it is DER's affirmative duty to seek out alternative possibly more suitable sites than the site Higbee originally proposed. Although the holdings of the Pennsylvania courts on this issue are not completely clear, it does seem that DER only has the duty to minimize the 'immediate' environmental incursion, i.e., the environmental incursion produced by the immediate project DER is evaluating. Swartwood v. DER, 56 Pa. Cmwlth. 298, 424 A.2d 993 (1981); Mignatti v. DER, 49 Pa. Cmwlth. 497, 411 A.2d 860 (1980); Delaware County Community College v. Fox, 20 Pa. Cmwlth. 335, 342 A.2d 468 (1975). In fact, requiring DER to perform its own search for alternative sites every time it receives a permit application would put an almost impossibly heavy burden on DER. As the Township rightly argues, if DER had the affirmative duty of finding alternative sites, it hardly could rely on the applicant's assurances that there are no superior alternatives; such assurances actually were received from Higbee. A search for alternative sites might be DER's duty when the proposed operation is expected to produce serious environmental incursions, but no such expected incursions have been shown in the instant appeal.

NWRA's post-hearing brief, noting this language from *Coolspring, supra*, argues (at 27):

> It is apparent that the Department fully complied with the requirements set forth in Section 105.15(b)(2) of its regulations relating to consideration of alternatives. The Department fully assessed, and in some cases reassessed, all viable alternatives, including all alternatives posited by appellants. That alternatives other than the alternatives considered by DER could possibly have

> been considered is not cause for reversal, especially in light of this Board's recent pronouncement in Coolspring Township, supra.

NWRA's cite to *Coolspring* is not completely apposite, because in the instant appeals (unlike the situation in *Coolspring*) possible serious environmental incursions have been identified, and have been the basis for the remand to DER we are ordering. On the other hand, the above quotation from NWRA's post-hearing brief correctly points out that DER did affirmatively examine a very wide variety of suggested alternatives to the proposed project, despite the very heavy burden this examination imposed on DER. The appellants have not shown that DER overlooked alternatives which reasonably might have been expected to mitigate the aforesaid environmental incursions requiring remand. For the one possible exception to this last assertion, namely the possible erosive impacts on the receiving streams, we have ordered DER either to reduce the erosion to insignificance or to balance the need for the project against the minimized erosive impact (subsection III C 1 *supra*).

In short, except possibly for deficiencies involving erosive effects on the receiving streams (which deficiencies will be remedied on remand), there has been no showing--in the light of Article I Section 27--that DER's issuance of the permits was an abuse of discretion for failure to adequately examine alternatives to the NWRA portion of the Point Pleasant project. The same conclusion holds for 25 Pa. Code §§105.14-105.16 which--in an apparent attempt to guarantee DER compliance with Article I Section 27--do require that DER take affirmative steps: (1) to minimize the environmental incursion; and (2) to balance the residual minimized incursion, if still significant, against the expected benefits of the project.

2. PECO Alternatives

A very considerable portion of the record in this matter deals with the possibility of using the Blue Marsh Reservoir which is located upstream from Limerick on Tulpehocken Creek, a tributary of the Schuylkill, as a source for cooling water for Limerick. We are convinced from a careful review of this record that Blue Marsh would not be even a technically feasible alternative to provide cooling water to both Limerick units.

Whether Blue Marsh is a technically feasible source of cooling water for one unit of Limerick is a closer question. For starters, the parties argue vigorously as to whether the 41 cfs which must be released at all times from Blue Marsh--to preserve the aquatic community downstream therefrom on the Tulpehocken Creek--could be counted as a release usable by Limerick. Some of this water would reach Limerick. However, this release constitutes the Q(7-10) low flow in Tulpehocken Creek. In other words, it is the lowest consecutive 7-day flow occurring (statistically) once in ten years; it does not represent water which was added to the Schuylkill Basin by creation of the Blue Marsh Reservoir, but rather the pre-reservoir flow of the Tulpehocken under low flow conditions. Thus, we think that DER was right to not count this flow in ascertaining the technical feasibility of Blue Marsh.

The next issue regarding Blue Marsh was whether DER should look just at the 8,000 acre-feet reserved in Blue Marsh for water supply, or whether it should also look at the 6,620 acre-feet of storage in Blue Marsh reserved for water quality augmentation. This is important because in an average year Limerick would need a cooling water supplement on 146 days, which equates to a need for 9,344 acre-feet. Thus, the 8,000 acre-feet alone clearly would be insufficient even in an average year (and this doesn't count the 8 mgd of the 8,000 acre-feet which is reserved for the Western Berks Municipal Authority). If, on the other

hand, the entire 14,620 acre-feet were available, Blue Marsh might be sufficient to satisfy Limerick's needs.

If the Blue Marsh release were given to Limerick, however, up to 21 mgd of this flow would be immediately consumptively used at Limerick (assuming full operation of one unit); thus these 21 mgd would not be available for maintaining flow in that portion of the Schuylkill downstream from Pottstown. Although we clearly understand the desire of the appellants to avoid the Point Pleasant project, we very much appreciate that it is DER's duty to protect the lower reaches of the Schuylkill. Therefore, we agree with DER that even technically the Blue March Reservoir is not a viable alternative to PECO's proposals for Limerick cooling water.

Further, there are many legal impediments to the use of Blue Marsh. Blue Marsh is owned by the Army Corps of Engineers, which operates the Reservoir in cooperation with the DRBC. Thus the DRBC would have to authorize the use of Blue Marsh for Limerick. The reasons why such authorization is most unlikely are succinctly described by Mr. Weston, who is not only a DER official but also is Pennsylvania's alternate commissioner on the DRBC.

In addition, even if the DRBC permitted Limerick to use Blue Marsh, and even if this were a technically viable solution, it would still not be an acceptable alternative given the requirement in PECO's DRBC Docket that PECO cannot withdraw water from the Schuylkill for cooling water purposes when the Schuylkill's flow at Pottstown falls below 530 cfs (for one unit or 580 cfs for both units). The testimony of DER's witness, Stephen Runkle, that Blue Marsh (even all 14,000 acre-feet of it) could not sustain a flow of 530 cfs in the Schuylkill during the second and eighth worst drought years was not contradicted. Indeed, 5 times as much water would be needed.

Finally, we note that recreation is one of the prime purposes of Blue Marsh, that Blue Marsh has a beach and a boat launching area, that Blue Marsh is used continuously for recreation during the summer months, that the recreational use of Blue Marsh depends upon maintaining a permanent pool level in the Reservoir and, finally, that withdrawals from Blue Marsh for Limerick would lower this pool and interfere with the recreational use of Blue Marsh.

In fact, the use of Blue Marsh has been thoroughly studied by DRBC and Blue Marsh has been identified as the sole substantial reservoir on the Schuylkill through the year 2000. Its future has been committed to all would-be users of water downstream from Tulpehocken Creek. Giving all of this water supply to one consumptive user is not just poor water planning, it is simply unfair.

Also suggested as alternate sources for Limerick are proposed Red Creek and Mill Creek Reservoirs. These proposed sites have been discussed as alternatives to the unbuilt Merrill Creek Reservoir, but neither site is approved by the DRBC nor under construction.

The appellants also suggested that it would be a viable alternative for the City of Philadelphia to transfer its allocation from the Schuylkill to PECO. In the first place, DER countered, this alternative would deprive the lower Schuylkill of the water consumed at Limerick, whereas withdrawal by Philadelphia at the mouth of the Schuylkill would not have this effect. In addition, Mr. Weston testified that Philadelphia's allocation is not transferable and thus could not be transferred to PECO. His testimony is uncontradicted.

In summary, there also has been no showing that issuance of the permits was an abuse of DER's discretion for failure to adequately consider alternatives to PECO's part of the Point Pleasant project.

Before leaving the subject of alternatives to the project, we feel compelled to state our view that appellants' attacks--whether on the NWRA or the PECO portions of the project--display a disregard for the orderly process whereby public projects are planned, designed and constructed.

The testimony of several witnesses concerning water quality planning, especially of the extremely well-qualified R. Timothy Weston, shows clearly that the consideration of needs for alternatives to water supply projects is best addressed in the planning process.

The Point Pleasant project has been exposed to intensive planning since 1966--a detailed history of DER and DRBC reviews appears above. DER, especially in the State Water Plan, and DRBC, especially in its Level B study, reviewed the need for the Point Pleasant project and each of the alternatives discussed above. This Board and the courts of this Commonwealth in the related field of sewage facilities planning have made it abundantly clear that the time to challenge the planning process is when the plan is being formulated, not later (and collaterally) when it is being implemented. *Kidder Township v. Commonwealth, Department of Environmental Resources*, 399 A.2d 799 (Pa. Cmwlth. 1979).

While we recognize that, unlike planning and permitting in the sewage facility arena, the present planning and permitting processes are not explicitly bound together by court decision or statutory language, we agree that DER need not "reinvent the wheel" with each permit application. At the very least, the fact that DER followed the recommendations of the State Water Plan and DRBC's Level B study in approving the Point Pleasant project is strong evidence that DER's decisions to permit the project were reasonable.

F. LAND USE

Appellants also challenge the secondary impacts of the Point Pleasant project. They argue that by providing abundant supplies of public water in areas where water is scarce today, undesirable growth would result. This argument fails to find either factual support in this record or support in the law. As to the lack of factual support, it is noted there is not a scintilla of evidence in this record that the Point Pleasant project would induce undesirable (or even desirable) growth in Bucks and Montgomery Counties.

Perhaps more importantly, under Pennsylvania law, local governments--not the state--are assigned the right and power to determine the type and rate of growth to occur within their jurisdictions.

They, and not the state, are considered to be the trustees of Pennsylvania's public natural resources in this regard. *Cyril Fox, supra.*

G. CONCLUDING REMARKS

Even with this lengthy Adjudication, we have not dealt with all of the appellants' myriad of contentions and charges. However, we believe we have dealt with any grounds raised by the appellants which conceivably could be of merit in these appeals. We therefore state categorically that any of appellants' contentions which have not been specifically ruled on *supra* have been rejected as wholly without merit.

In particular, we have been given no urgent reasons to overturn DER's issuance of a water quality certification to the Corps of Engineers, pursuant to §401 of the Federal Clean Water Act (see subsection III A 2). That appeal, which has not been specifically discussed *supra*, is unequivocally dismissed, independent of our ultimate resolution of the standing issue discussed in subsection III B 1 *supra*.

We also observe that all our rejections of appellants' contentions have been based on the merits of those contentions. By so doing, we have avoided reliance on principles of issue preclusion, which for many of appellants' contentions well might have been applicable; as our review of previous related actions in subsection III A 3 has indicated, the environmental impacts of the Point Pleasant project have been litigated and relitigated in agency decisions and court rulings alike. As we have proceeded, however, there has been no need to rule on the difficult issue of whether other agency rulings would be as preclusive as rulings by courts of record, nor have we had to decide whether the subjects on which we have ruled really were adequately litigated in previous hearings. We add, importantly, that insofar as we can judge there have been no previous litigations--by which we should feel bound[7]--of any of the issues which we hold require remand, namely: (1) the need for NPDES permits; (2) the requirement that the need for the project be balanced against the impact of erosion on the receiving streams, if the velocities in the East Branch or the North Branch cannot be reduced to 2.0 fps; and (3) the requirement that PECO's permit be conditioned to call forth a cutoff when the Bucks Road gauge reads 125 cfs.

Except for our rulings that the permits are remanded to be conditioned in conformity with the requirements (1) - (3) just summarized, the appealed-from permits are upheld, as not having been shown to be an abuse of DER's discretion.

---

7. This assertion explicitly applies to the "Initial Decision" of PUC Administrative Law Judge Isadore Kranzel, Docket No. A-00103956 (December 12, 1983).

CONCLUSIONS OF LAW

1. The Environmental Hearing Board has jurisdiction over the parties and subject matter of the consolidated appeal.

2. The Environmental Hearing Board's scope of review in this consolidated appeal is to determine whether the Department of Environmental Resources has commited an abuse of discretion or an arbitrary exercise of its duties and powers.

3. Appellants Del-Aware Unlimited, Inc., et al. and intervenors Friends of Branch Creek have the burden of proof in this appeal.

4. A National Pollutant Discharge Elimination System Permit is required for the diversion of water from the Delaware River to the North Branch Neshaminy Creek and to the East Branch of Perkiomen Creek.

5. The Department correctly applied Subchapter G as opposed to Subchapter F of the Department's Chapter 105 regulations in reviewing NWRA's and PECO's applications to construct outfall structures in the North Branch Neshaminy Creek and the East Branch of Perkiomen Creek. This Subchapter required the Department to consider the erosive impacts of these outfalls.

6. DER's analysis of alternatives to the Point Pleasant project, as presented in its Environmental Assessment, more than satisfied the requirements of Article I Section 27.

7. The Department complied with its Chapter 105 regulations in preparing the Environmental Assessment, including its consideration of alternatives.

8. Under Article I, Section 27 of the Pennsylvania Constitution the Department's actions must meet the three-fold standard adopted by the court in *Payne v. Kassab*, 11 Pa. Cmwlth. 14, 312 A.2d 86 (1973), exceptions dismissed,

14 Pa. Cmwlth. 491, 323 A.2d 407 (1974), aff'd, 486 Pa. 226, 361 A.2d 263 (1976), for compliance with Article I, Section 27 of the Constitution.

9. Because it did not require NWRA and PECO to obtain NPDES permits, DER did not comply with the first of the three *Payne* standards, i.e., DER did not ensure compliance with one of the statutes relevant to the protection of the Commonwealth's public natural resources; however, the requirements of Article I Section 27 will be satisfied by conditioning the appealed-from permits so as to forbid actual discharges into the receiving streams before these NPDES permits are received and complied with.

10. In order to comply with the second and third of the three *Payne* standards, DER should have required NWRA and PECO to cease discharges if and when the flow velocities of the respective creeks below their outfalls exceed 2.0 fps, or, in the alternative, DER should have quantified the damage to the receiving streams caused by velocities above 2.0 fps and determined that the benefits to be derived from the project would clearly outweigh this environmental harm.

11. DER has met the expressions of the *Payne* standards contained in 25 Pa. Code Chapter 105, particularly at §§105.14(6)(7) and (d), 105.15(b)(2) and (3), and 105.16 (a) and (d), except possibly for erosive effects on the receiving streams (see Conclusion of Law 10 *supra*).

12. The present deficiencies of the permits vis-a-vis the second and third prongs of the *Payne* standard can be corrected by remand as per Conclusion of Law 10 *supra*.

13. DER did not abuse its discretion in reaching the conclusions of no significant environmental impact regarding the following issues which were addressed in the Environmental Assessment:

A. Operational impacts of intake structure on the Delaware River

(1) aquatic ecology

(2) low flows

(3) salinity

(4) water quality (all aspects)

B. Delaware Canal

(1) Installation Procedure

(2) Aesthetic, Scenic and Historic Considerations

(3) Archaeological Impacts

C. Land Use

D. Wetlands along East Branch Perkiomen Creek

E. Alternatives

14. The property interests of riparian landowners on the North Branch are sufficient to confer standing to appeal DER actions affecting the North Branch.

15. Del-Aware has representational standing to appeal, if at the time it filed its appeal there were members of Del-Aware who had standing to appeal.

16. Though Del-Aware has been granted provisional standing, NWRA retains the right to demand proof of the facts on which Del-Aware relies for its representational standing.

O R D E R

WHEREFORE, this 18th day of June , 1984, the Board remands all the outfall permits to DER for actions--on (1) NPDES permits; (2) erosional impacts; and (3) Bucks Road gauge determination of PECO's flow cutoff--consistent with the accompanying Opinion; the Board retains jurisdiction. The appeal of DER's water quality certification is dismissed.

ENVIRONMENTAL HEARING BOARD

Edward Gerjuoy

EDWARD GERJUOY, Member

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, Pa. 17120

June 26 , 1984

EXHIBIT NGSKR 103

IN REPLY PLEASE REFER TO OUR FILE

A-00103956

ALL PARTIES OF RECORD

Application of Philadelphia Electric Company for a finding of necessity for the situation of a pumphouse to contain pumping and accessory equipment on a site located at the intersection of Bradshaw and Moyer Roads, in Plumstead Township, Bucks County

---

To Whom It May Concern:

Please be advised that at Public Meeting held on June 22, 1984 the Commission postponed a ruling on the above-referenced matter for an unspecified period.

The Commission has taken notice of an Adjudication issued on June 18, 1984 by the Pennsylvania Environmental Hearing Board at Docket Numbers E.H.B. 82-177-H and E.H.B. 82-219-H which remands certain matters to the Department of Environmental Resources and has granted the parties 30 days within which to file comments.

Please file any comments within 30 days of the date of this letter.

Sincerely,

Jerry Rich

Jerry Rich
Secretary

Public Meeting July 6, 1984

MOTION

RE: ORDER TO SHOW CAUSE WHY THE CONSTRUCTION OF LIMERICK UNIT II IS IN THE PUBLIC INTEREST

On October 10, 1980, this Commission entered an Order at docket number I-80100341 initiating an Investigation into the need for, and economy of, the Limerick Nuclear Generating Station of Philadelphia Electric Company (PECO). At the end of the Investigation, the Commission concluded that the simultaneous construction of Limerick Units I and II would not be in the public interest because of PECO's precarious financial condition and the effect that the continued construction of both units would have upon PECO's ability to provide safe and reliable service. PECO was given the option of either cancelling Unit II, or suspending Unit II until Unit I was completed; however, if PECO refused to suspend or cancel Unit II, the Commission would not approve any future securities issuances to raise capital for construction of Unit II. The Commission's Order was reversed by the Commonwealth Court but was upheld by the Supreme Court of Pennsylvania. Pennsylvania Public Utility Commission v. Philadelphia Electric Co., 501 Pa. 153, 460 A.2d 734 (1983). After the Supreme Court decision, PECO indicated that it intended to suspend Unit II until Unit I was completed, and then resume construction.

Recent developments have raised anew grave concerns regarding PECO's ability to provide adequate service at reasonable rates. PECO filed for a general rate increase on April 27, 1984, and has already announced its intention to file for another increase after Unit I

comes on line in 1985. The amount of human suffering that these increases could cause is deplorable. The spectre of these rate increases also threatens to further undermine the economic climate in Southeastern Pennsylvania. Indeed, recent attempts by the Scott Paper Co. to generate its own power and sell the excess to PECO, and by Luken's Steel Co. to obtain power from Pennsylvania Power & Light Co, are both attributable in part to the high level of PECO's current rates. Future rate increases can only accelerate the efforts of industrial customers to either seek alternative sources of power or to move out of PECO's service territory.

Unit I is scheduled to be completed in April 1985. At that time, PECO could resume construction of Unit II. In light of recent developments, however, we are concerned that the impending construction of Unit II might not be in the best interest of PECO's ratepayers.1/ Therefore, we should order PECO to show cause why the construction of Unit II is in the public interest. Specifically, this proceeding should address the following issues:

1. Is construction of Unit II necessary for PECO to maintain adequate reserve margins?

2. Are there less costly alternatives - such as cogeneration, additional conservation measures, or purchasing power from neighboring utilities or the P.J.M. interchange - for PECO to obtain power or decrease consumption?

3. How will the large capital requirements necessary to complete Unit II affect PECO's financial health and its ability to provide adequate service?

1/ We are also concerned whether PECO's current bond rating of BAA3, which means that PECO's bonds have speculative characteristics, might drop further if PECO resumes construction of Unit II when Unit I is completed.

4. Should the Commission reject any securities filings, or impose any other appropriate remedy, to guarantee the cancellation of Unit I"?

5. If Unit II is cancelled, what, if any, percentage of the sunk costs should PECO be permitted to recover from its rate-payers?

6. If construction of Unit II is found to be in the public interest, should the Commission adopt an "Incentive/Penalty Plan" as an inducement to cost efficient and timely construction?

We believe that our duty to guarantee just and reasonable rates and to maintain adequate service require that the above issues be addressed by all affected parties and resolved by the Commission prior to April 1985, the date upon which construction of Unit II could resume; THEREFORE,

WE MOVE:

1. That the Philadelphia Electric Company be ordered to show cause why the completion of Limerick Nuclear Generating Station, Unit II, would be in the public interest.

2. That the Law Bureau prepare the necessary Order to Show Cause.

Bill Shane — 6/28/84 DATE

Frank Fisher — 6/28/84 DATE

Michael Johnson — 6/28/84 DATE

_____ _____ DATE

_____ _____ DATE

ings (which are incorporated as being cumulative to the present one), require, in our view, that the Commission now address the potential for alternatives, and consider the impact on the applicant's ability to operate the plant as proposed.

In light of the circumstances, you are requested to respond to this 2.206 petition as quickly as possible, and your failure to respond within thirty days, will be treated as a denial for purposes of appeal.

Sincerely,

Robert J. Sugarman
Counsel for Del-AWARE
Unlimited, et. al.

r10.rjs/sp
enclosures