

ILLINOIS POLLUTION CONTROL BOARD
April 27, 1978

CENTRAL ILLINOIS PUBLIC SERVICE)	
COMPANY,)	
)	
Petitioner,)	
)	
v.)	PCB 77-158
)	
ENVIRONMENTAL PROTECTION AGENCY,)	
)	
Respondent.)	

THOMAS L. COCHRAN, SORLING, NORTHRUP, HANNA, CULLEN & COCHRAN,
APPEARED ON BEHALF OF PETITIONER;
ANN L. CARR, ASSISTANT ATTORNEY GENERAL, STATE OF ILLINOIS,
APPEARED ON BEHALF OF RESPONDENT.

OPINION AND ORDER OF THE BOARD (by Mr. Goodman):

On May 31, 1977 Central Illinois Public Service Company (CIPS) filed this Petition pursuant to Rule 203(i)(10) of the Board's Water Pollution Regulations, Chapter 3 (Regulations). Rule 203(i)(10) provides for Board promulgation of specific thermal water quality standards to be applied to an artificial cooling lake upon satisfactory demonstration to the Board that the lake will be environmentally acceptable. Hearing was held in this matter on October 2, 1977; there were no members of the public present, and no public comment has been received by the Board.

Coffeen Lake, the subject of this Petition, is an artificial cooling lake formed by the construction of a dam across the McDavid Branch of the East Fork of Shoal Creek in 1963. The purpose of the lake was to supply cooling capacity for CIPS' Coffeen Power Station located in Montgomery County a few miles south of Coffeen, Illinois. Due to the rolling terrain in this area, the lake formed by the dam has the convoluted configuration shown in Figure 1. The average depth of Coffeen Lake is 18 feet; the maximum depth is 52 feet. The dam is about 1200 feet from the East Fork of Shoal Creek, the first 350 feet of that distance

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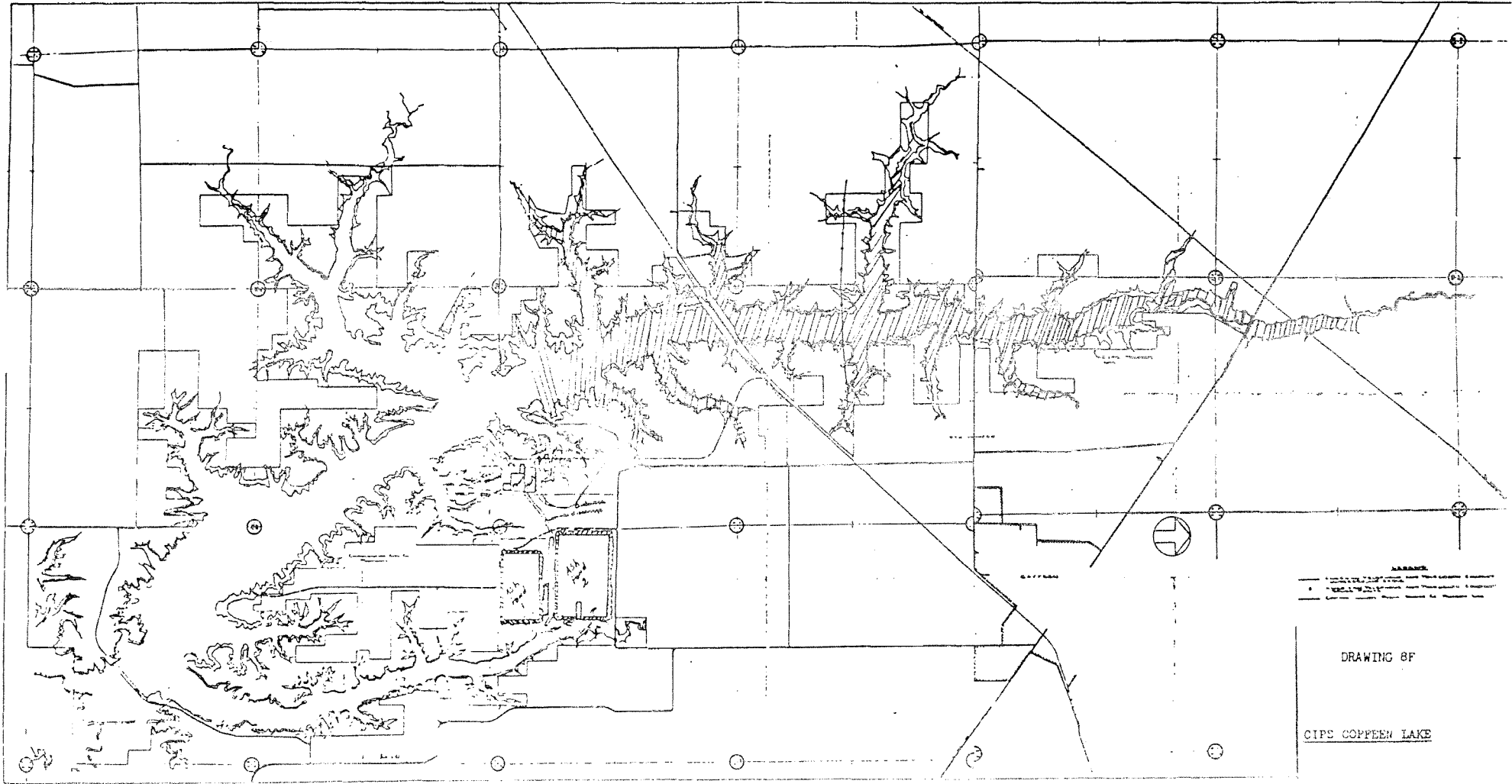


FIGURE 1

being a concrete spillway. The area between the spillway and the East Fork of Shoal Creek consists of an earthen channel with trees, dirt, etc. The Station's condenser cooling water travels through a half-mile flume which discharges over a spillway into the Lake. The total length of the cooling water path from the discharge point to the intake point is about 4 miles, the cooling loop running from discharge to intake without entering that portion of the Lake which is upstream from the intake.

The Lake was designed originally to serve as a settling basin for overflow from the ash ponds and also received runoff from the coal pile, regenerative wastes, and various other effluents resulting from the operation of the Station (R.323). Coal is brought to the Station by conveyor belt from the mouth of a mine located adjacent to the Power Station. From September, 1966 until July, 1969, the Lake was leased to the Illinois Department of Conservation and was officially open to the public. The Department of Conservation terminated its rights as Lessee in 1969, apparently due to an internal administrative decision assessing priorities. In 1964, 250,000 large mouth bass fingerlings were released by the Department of Conservation, and in 1966, some fiddler channel catfish were released by a local club, and a private individual released some 200 white crappies. CIPS has undertaken no fish management practices of any kind, and since 1969 the Lake has not been opened to the public, although some people continue to fish the Lake as trespassers (R.52, 79). All of the foregoing information was taken from CIPS' Thermal Demonstration (TD), unless otherwise noted.

Rule 203(i)(10) states that a Petitioner must meet certain requirements before the Board will promulgate specific thermal standards to be applied to Petitioner's discharge to an artificial cooling lake. The first requirement is that all discharges from the artificial cooling lake to other waters of the state comply with applicable provisions of Rule 203(i)(1-4). In general this Rule requires that there be no abnormal temperature changes that may adversely affect aquatic life, that the normal daily and seasonal temperature fluctuations be maintained, that the maximum temperature rise above natural temperatures shall not exceed 5°F, and that the water temperature at representative locations in the main river shall not exceed the maximum limits which are indicated during more than 1% of the hours in the 12 month period ending with any month. In addition, at no time shall the water temperature at such locations exceed the maximum limits as indicated by more than 3°F. The indicated maximum temperature of interest to this proceeding is 90°F.

It is apparent from the data and the briefs presented by both parties that little or no discharge to other waters of the State has occurred since Coffeen Lake was established in 1965. The Agency argues that CIPS has failed to show compliance with Rule 203(i)(1-4) since no studies have been done either on the receiving water, Shoal Creek, or on the effect upon it by discharges from Coffeen Lake. Considering the apparent lack of discharge to Shoal Creek, the Board finds that any studies made by CIPS would have been, at best, a waste of time and, at worst, misleading and non-conclusive. In order to measure the impact of a discharge, one must first presume the existence of a discharge capable of having an impact. The Board finds in this case that such a discharge has not existed with respect to Coffeen Lake and therefore finds CIPS' presentation with respect to 203(i)(10)(aa) sufficient.

Rule 203(i)(10)(bb) provides that the heated effluent discharge to Coffeen Lake must comply with all applicable provisions of Chapter 3 other than Rule 203(i)(1-4). Data and testimony presented by CIPS (R.14) along with a variance granted by the Board in PCB 77-221, convinces the Board that CIPS is in compliance with Rule 203(i)(10)(bb). In addition, the Agency, on page 5 of its brief herein states "the EPA does not in this proceeding dispute the general allegation of CIPS that Rule 203(i)(10)(bb) has been complied with".

Rule 203(i)(10)(cc) calls for a demonstration by CIPS to the Board that Coffeen Lake will be environmentally acceptable and within the intent of the Act notwithstanding the proposed specific thermal standard. Such a showing must include, but is not limited to, conditions capable of supporting shellfish and wildlife and recreational uses consistent with good management practices and consideration of the control of the thermal component of the discharger's effluent by a technologically feasible and economically reasonable method. At the hearing held herein CIPS presented its Thermal Demonstration along with two addenda designed to keep the demonstration current (Exhibits 1, 2, and 3). The Agency filed a response to CIPS' presentation recommending that the alternate thermal limits requested be denied. The Agency points out that the water temperatures in Coffeen Lake are quite high when compared with noncooling lakes in Illinois, that CIPS had failed to discuss the possibility of modification of a flow pattern of the cooling water or utilization of the cool hypolimnetic layer by mixing, and that CIPS had failed to address the environmental impact of a proposed increase in the amount of water pumped from Shoal Creek to achieve a discharge over the spillway of the dam.

Testimony at the hearing by Richard J. Grant, CIPS' water quality engineer, concerning the possible modification of the

cooling loop to include the surface area of the entire Lake, indicated that such a project would be very expensive. In addition, since the area in question is the upstream portion of the Lake, additional equipment would have to be installed to treat the higher level of colloidal silica which occurs due to the influx of runoff at that point (R.14-20). More importantly, such a modification would, while lowering the average temperature of the hot portions of the Lake, destroy the portions of the Lake which are now at a much lower temperature and undoubtedly used by the fish as a refuge during the hot summer months when temperatures within the cooling loop are uncomfortable for them. The result could be a Lake whose entire area is uncomfortably warm for the fish and provides no place for them to find refuge. The higher temperature within the limited cooling loop would also afford a higher rate of heat transfer per square foot of surface area of heated water, although total heat evolution from the Lake would necessarily have to be the same in either case assuming constant lake temperature. The Board finds, therefore, that the known existing conditions are preferable to the unknown results of a very expensive modification to the cooling loop. The same evaluation applies to the possibility of mixing the cool lower levels of the Lake with the heated portions within the cooling loop.

Section 10 of the Thermal Demonstration addresses the technological feasibility and economic reasonableness of controlling the thermal component of the discharge through the use of cooling towers. The estimated construction and equipment cost and capitalized operating costs for Coffeen Lake as developed by Sargent and Lundy amounts to approximately \$20,000,000. In addition CIPS points out the well known environmental problems concerned with the plume from cooling towers. The Agency did not address the question of cooling towers.

The major question in this matter is whether Coffeen Lake will be capable of supporting shellfish, fish and wildlife and recreational uses consistent with good management practices, even if such uses are not actually instituted. In the Opinion supporting the Order in the Cooling Lakes Regulation, R75-2, adopted on September 29, 1975, the Board made the following comment concerning Sub-section (cc)(1) of the Rule:

Under subsection (cc)(1), it is not absolutely required that there be a fishery, or that an artificial cooling lake provide recreational or any other uses except that for which it was designed. One public comment pointed out that factors besides generating plant operations might prohibit a recreation facility.²⁴ But

it is nonetheless felt that by requiring such conditions in a lake we will have taken a significant step in protecting water quality.

Qualitatively, while the end use of a body of water is indeed important, and may be weighed by the regulatory process, the Board is most concerned with assuring water quality sufficient to allow these (fishery and recreational) and any other beneficial and ecologically-sound uses. We may not require that water be properly and beneficially used; we must require that it can be used (emphasis added).

In this case, Coffeen Lake is not officially being used for any purpose other than that for which it was designed. The question before the Board therefore is whether or not conditions exist which might allow for uses as noted in Section (cc)(1) of Rule 203(i)(10).

Most of the testimony adduced at the hearing concerned the plants and animals constituting the food chain in the Lake and their ability to support a fishery. The quick answer to the question is that Coffeen Lake does indeed contain a variety of fish including those stocked previously as noted above. There was no indication in the record that the Lake sustains any particularly dramatic fish kills, there being in fact only three recorded during the life of the Lake, apparently the worst of which concerned some 80 to 100 gizzard shad found during the period of startup of the second unit (R.47-55, Thermal Demonstration Figures 8a-1, 8a-2). In addition, evidence presented at the hearing indicates that fishing does occur on the Lake notwithstanding the fact that there is no public access thereto. The Agency, while not seriously questioning the existence of a fishery in Coffeen Lake, does question the condition of that fishery and its continued viability in the future.

While generally questioning the amount of data used by CIPS to support its Thermal Demonstration, the Agency specifically questions the condition of the fish, the abundant concentrations of blue-green algae, the continuing drop of alkalinity and bicarbonates over the last eleven years, and the ability of the fish to survive the heated water during the summer months. The Agency's questions focus primarily upon what might be the future of Coffeen Lake rather than its existing conditions. Although the Board would agree with the Agency that the data presented by CIPS might well be described as minimal in both quality and quantity, we find that it is sufficient when considered along with the history and the present situation of the Lake. As an example, the ability

of the fish to survive the heated water during the summer months has certainly been proven. There have been no recorded fish kills of any consequence during the entire life of the Lake, and the fish stocked some twelve years previous are still present in the Lake in quantities sufficient to attract fishermen despite the lack of subsequent stocking or fishery management during that period. The Board finds that survival of fish subsequent to a single stocking for a period of twelve years is sufficient evidence that Coffeen Lake in its present condition will support a viable fishery. The Board again emphasizes that it is not necessary that CIPS create and sustain a fishery in Coffeen Lake but rather that Coffeen Lake be in such a condition as to allow the presence of a fishery.

With respect to the other concerns of the Agency about the concentration of algae and the drop of alkalinity and bicarbonates, the Board finds that these concerns, although legitimate, go more to the chemical and physical condition of Coffeen Lake than to the effects of the thermal constituent of CIPS' discharge. The Board, however, is concerned about these conditions in Coffeen Lake and about the effect of the changes, including construction of a new treatment plant and proposed continuous discharge over the dam, now being instituted and proposed by CIPS to correct them, especially with regard to the effect upon the temperature of Coffeen Lake and Shoal Creek. (P.91, 92, Thermal Demonstration). Because of this concern, the Board finds that a permanent specific thermal standard for Coffeen Lake is not warranted at this time. The Board will set interim thermal standards for Coffeen Lake as requested by CIPS for a period of three years. At the end of that three year period and upon a showing before the Board by CIPS that Coffeen Lake meets the criteria of Rule 203(i)(10), these specific thermal standards shall become permanent.

This Opinion constitutes the findings of fact and conclusions of law of the Board in this matter.

ORDER

It is the Order of the Pollution Control Board that:

1. For the period of time ending three years from the date of this Order, the thermal discharge to Coffeen Lake from Coffeen Station shall not result in a temperature measured at the outside

edge of the mixing zone in Coffeen Lake exceeding 98°F during more than 8.2 percent of the hours in the twelve month period ending with any month, and in any event shall at no time exceed 108°F.

2. If at the end of the three year period noted in (1) above, Central Illinois Public Service presents evidence which convinces the Board that Coffeen Lake meets the criteria of Rule 203(i)(10), the interim limits noted in (1) above shall become permanent specific thermal standards for Coffeen Lake.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 27th day of April, 1978 by a vote of 5-0.



Christan L. Moffett, Clerk
Illinois Pollution Control Board