

ILLINOIS POLLUTION CONTROL BOARD
May 9, 1986

ELECTRIC ENERGY, INC.)
)
 Petitioner,)
)
 v.) PCB 85-171
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

OPINION AND ORDER OF THE BOARD (by J. Marlin):

This matter comes before the Board upon a petition for variance filed October 31, 1985 by Electric Energy, Inc. (Electric) from the 2 mg/l total iron and 6-9 pH effluent limitations located at 35 Ill. Adm. Code 304.124 and 304.125, respectively, for its discharge at outfall 010 until December 31, 1986 or until new facilities are completed and operating. Hearing was waived and none was held. The Illinois Environmental Protection Agency (Agency) filed its recommendation to deny on February 13, 1986. On February 19, Electric filed a response containing some new information. In response to a March 14, 1986 Board Order, Electric filed a supporting affidavit for the new material in its response, which the Board construes as an amended petition. The Agency filed an amended recommendation on April 9, 1986. The Agency recommended denial based on its conclusion that the requested plan was not consistent with Federal law. A permit appeal proceeding (PCB 85-14) involving like issues at Electric's Joppa, Illinois plant was stayed until February 6, 1986 by Board Order dated October 10, 1985.

Electric operates a six unit coal fired steam electric generating station, at Joppa, Massac County, Illinois with a total capacity of 1086 megawatts (gross). It discharges to the Ohio River pursuant to NPDES Permit No. IL 0004171. The station supplies bulk electricity to many customers. Electric employs about 325 people at this station.

At the plant wastewater from several low volume sources are collected in a settling lagoon. The sources include coal reclaim sump pit and dumper drains, floor drains from the crusher houses, north water treat plant and the main plant, and the bottom ash hopper overflow. In its variance petition, Electric classified another wastewater source, coal pile runoff, as a low volume waste source (Pet at 2). For reasons discussed later, this was in error.

Settling lagoon effluent is then discharged at outfall 010 to the condenser cooling water intake bay. The cooling water bay, or intake channel, is located between the condenser cooling water intake structure and the north bank of the Ohio River. The cooling water bay connects the intake structure to the Ohio River so that sufficient water may be withdrawn from the river to condense the expended steam from the steam turbines. The heated water is then returned through a separate discharge channel to the Ohio River at outfall 006-007, downstream of the intake channel.

Electric requests a variance for outfall 010 where the settling lagoon effluent is discharged to the cooling water bay.

Electric lists the pH range for the settling lagoon discharge (010) as 3.22 to 8.28 during the period September 1983 to September 1985 with an average of 4.75. Total iron monthly average measurements between February and September 1985 are as follows (Pet. at 4, Ag. Rec. At 3):

February 1985	4.3 mg/l
March 1985	1.6 mg/l
April 1985	0.7 mg/l
May 1985	1.72 mg/l
June 1985	1.78 mg/l
July 1985	0.6 mg/l
August 1985	1.06 mg/l
September 1985	0.7 mg/l

The data show violations of the pH effluent limitation. While the Agency asserts that only one violation of the iron limitation occurred in eight months and that relief is unnecessary (Ag. Rec at 4), the Board disagrees with this assertion. One violation in eight out of the twelve months coupled with the sparcity of iron effluent data could support a request for variance from the iron limitation, especially for a short variance period.

In its response, Electric furnished the Board with past metals concentrations at lagoon outfall 010 and others (Response, see Attachments). Some monthly average iron concentrations at outfall 010 are listed as 1.97, 1.88, 4.40 and 1.2 mg/l for November 1976, October 1979, April 1980 and October 1980, respectively (Electric letter 1-14-81 and graphs). The data is not overly helpful because of the infrequency of measurement and the lack of flow and production data. If such data had been included, the Board could then determine whether such values were representative of the time and whether they could be compared to present values.

Before discussing Electric's proposal and other alternatives for compliance, two issues need to be addressed. The answers will decide what pollution control plan(s) should be followed to

comply with the pH and iron limitations. The two issues are as follows:

- 1) Is a cooling water intake bay a water of the state; and
- 2) Pursuant to 40 CFR 423.12(b)(12) and 423.12(b)(1), whether the 010 lagoon discharge, which includes acidic coal pile runoff, should be treated before mixture with once through cooling water.

Water of the State

The Board has previously indicated to the present parties in the companion permit appeal, PCB 85-14, that "if a re-routing of the settling lagoon discharge from the cooling water bay to the condenser inlet structure is designed to create a totally enclosed system, the Board would agree that the discharge to a water of the state issue would be eliminated." [PCB 85-14, September 20, 1985 Order]. The Order in that case did not have to squarely address the issue of whether the cooling water bay is a water of the state. The Board does so today.

The Clean Water Act (CWA) (33 U.S.C. 1251 et seq.) and the Illinois Environmental Protection Act (Act) (Ill. Rev. Stat. 1985, ch. 111 1/2, par. 1001 et seq.) and the regulations thereunder provide a framework to control water pollution. Discharges of pollutants are prohibited unless permitted pursuant to the National Pollutant Discharge Elimination System (NPDES) (33 U.S.C. 1342). This system is applicable to the State of Illinois through Sections 11 and 12 of the Act (Ill. Rev. Stat. 1985, ch. 111 1/2, pars. 1011, 1012). Through this regulatory framework a system of water quality and effluent standards was established pursuant to CWA Sections 303 and 301, respectively (33 U.S.C. 1313, 1311). The effluent standards are limitations on sources which are imposed so that a stream may achieve the water quality standards (WQS), which are the goals for a certain stream. The goals, or WQS, were set to protect the use desired of a stream.

The water pollution regulatory framework is applicable to all waters of the state. The Act defines waters as "all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this State." (Act, par. 1003 (oo)). The definition of waters at 35 Ill. Adm. Code 301.440 echoes the Act definition but excludes treatment works and sewers, which are regulated elsewhere. The sewer exception is inapplicable to the cooling water bay. One could assert that the bay is a treatment works, which is defined at 35 Ill. Adm. Code 301.415:

Treatment Works: Individually or collectively those constructions or devices (except sewers, and except constructions or devices used for the pretreatment of wastewater prior to its introduction into publicly owned or regulated treatment works) used for collecting, pumping, treating, or disposing of wastewaters or for the recovery of byproducts from such wastewater.

The bay is neither a construction nor a device, therefore it is not a treatment works. The bay does not fall under either exception.

Electric asserts that the bay is not a water of the state because very little discharge from lagoon outfall 010 would ever reach the Ohio river. As Electric states in its petition:

[f]inally, the rate of discharge from outfall 010 to the cooling water bay is only 3,475,000 gpd on a daily average while the water intake rate into the condenser cooling system is fully 505,985,000 gpd on a daily average. This difference in flow rates causes the direction of flow to be toward the condenser cooling system intake structure and away from the Ohio River. Very little, if any, discharge from the settling lagoon will ever flow directly through the bay to the Ohio River. See also Exhibit B, paragraph 21. [Pet. at 10].

The rate of flows involved, however, support the classification of the cooling water bay as a water of the state. The effect of this system of flows is to cause Ohio River water to continually flow into the cooling water intake bay so as to provide sufficient water "to condense the 'expended' steam from the steam generator turbines." (Exh. B to pet., par. 21). The cooling water bay is an extension of the river proper: the bay is physically continuous with the Ohio River, its water level rises and falls with that of the Ohio River, and it contains no obstructions to the movement of biota from the Ohio River (Exh. B to the Petition, par. 19).

The Board, for the above reasons, finds the cooling water intake bay to be a water of the state.

Interpretation of 40 CFR 423.12(b)

Electric relies on a 1977 stipulation with USEPA and contends that commingling the lagoon effluent, which includes acid coal pile runoff, with the alkaline once through cooling

water is permitted for pH control under 40 CFR 423.12(b)(1) and (12).

The Agency argues that in 1977, at the time of the stipulation, Subpart D of Part 423 did not mention combining waste streams and that in 1982 the regulations were amended (Ag. Rec. at 7; 47 Fed. Reg. 52290). Therefore, the Agency argues that the lagoon effluent (010) must be treated prior to admixture with the once through cooling water for pH control.

Section 423.12 of 40 CFR establishes effluent limitation guidelines representing the degree of effluent reduction attainable by the use of the best practicable control technology currently available (BT) for the steam electric power generating point source category. Subsection (b) (9) regulates coal pile runoff discharges. Subsection(b)(1) provides that "[t]he pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0." Subsection(b)(12) provides:

In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

At Electric's Joppa plant, various low volume waste sources and coal pile runoff combine in the lagoon and are discharged at outfall 010. Electric asserts that it may commingle its combined wastestreams from lagoon outfall 010 with the once through cooling water before any pH treatment. In this manner, the pH of both wastestreams would neutralize, any metals from the lagoon effluent would precipitate out, and pH treatment would be unnecessary. Electric relies on a USEPA letter dated October 18, 1985 (Attached to Ag. Rec) to support its commingling assertions, but its reliance is misplaced. The pertinent portion of the letter states:

The pH limitation per Part 423 applies at the "end-of-pipe" discharge to surface waters when the wastewater discharge contains low volume wastewater that is commingled with once-through cooling water. However, the intent of Part 423 is also that the total suspended solids and oil and grease limitations applicable to low volume waste streams be applied to the low volume waste component of such a combined discharge prior to commingling of the individual waste streams.

What the letter does not say is that when there are combined wastestreams which include coal pile runoff, pH is to be controlled at the end-of-the-pipe. The letter speaks only of low volume wastestreams to be commingled with once through cooling water.

There is no support for the conclusion that where only low volume wastestreams are involved, the pH effluent limitation may be met after commingling with once through cooling water. Either the pH limitation applies at the end-of-pipe for all wastestreams or at each point source, such as coal pile runoff, before commingling with once through cooling water.

Subsection 423.12(b) regulates many different types of discharges, including low volume, fly and bottom ash and metal cleaning wastestreams. Effluent limitations as specified in paragraphs (3), (4) and (5) for example are applied at the point of discharge of that pollutant before commingling with once through cooling water. Paragraph (9) regulates total suspended solids (TSS) from coal pile runoff "point source discharges." The point source discharge for the coal pile runoff in 40 CFR 423.12(b)(9) is lagoon outfall 010.

Looking at the individual wastestreams, the effluent limitations are applied before commingling with once through cooling water. This exemption from pH treatment for once through cooling water (40 CFR 423.12(b)(1)) should not be read broadly where there are combined wastestreams. A literal and limited construction, which the Board endorses, would exempt a discharger from regulating the pH of once through cooling water when such water is the only discharge. In the case of combined discharges, however, the Board construes the regulation to require pH treatment of the other discharges before commingling with the once through cooling water.

The Board finds that the pH limitation of 40 CFR 423.12(b)(1) applies to the combined wastestreams of lagoon outfall 010 effluent, which effluent includes both coal pile runoff and low volume wastestreams, before commingling with once through cooling water.

The Proposal and Alternatives

Electric sets forth its proposal to comply with the 2 mg/l total iron and 6-9 pH effluent limitations. Electric proposes to eliminate the lagoon discharge at outfall 010 to the cooling water bay by extending and physically connecting the settling lagoon discharge pipe to the intake structure of the condenser cooling system. The actual construction details are set forth in paragraphs 4 through 8 of the Exhibit A. The compliance schedule has been amended by paragraph 25 of Exhibit B and is to be attained by December 31, 1986. The cost is approximately \$63,000

and would reduce one years net income by 4 percent before depreciation, with no operating expense (Ag. Rec. at 8).

Based on the Board's findings and interpretations above, the proposal would be insufficient for compliance with the pH and iron effluent limitations. The proposal would eliminate the discharge to water of the state: it would not solve the conflict with 40 CFR 423.12(b). Other alternative control systems are examined below.

One alternative would be to pump the generally acidic settling lagoon effluent to the generally alkaline ash pond (Pet. at 6). As a consequence, metals would precipitate out in the ash pond. A multiple pump installation would be required as well as corrosion resistant materials for the pipes and pumps. This alternative would end the discharge to the cooling water bay and would also treat the lagoon effluent in the ash pond for pH before discharge in compliance with 40 CFR 423.12(b)(1). Capital cost would be \$174,300 and the annual operating cost would be \$37,000. No annual maintenance cost is presented. It would reduce one year's net income by 12 percent before depreciation and increase annual operating costs by 0.02 percent (Ag. Rec. at 8).

The second alternative would involve the addition of lime on a continous basis to the settling lagoon to raise its pH, thereby causing iron and other metals to precipitate out. This alternative also would bring Electric into compliance. The alternative would include a packaged facility capable of receiving, mixing, and metering the addition of the lime. Electric estimates the capital cost of this compliance alternative to be at least \$158,000 and an annual operating cost of \$116,000 excluding maintenance costs. It would reduce one years net income by 8 percent before depreciation and increase annual operating costs by 0.1 percent (Ag. Rec. at 8).

A third alternative would involve the use of a tarp or dome to shield the 10 acre, 500,000 ton coal pile from rainfall. Electric estimates this alternative to cost in the millions of dollars. This alternative as well as a fourth alternative, derating or shutting down the plant, appear unnecessary and ineffective according to the Agency (Ag. Rec. at 6).

Environmental Impact

The general use total iron water quality standard (WQS) of 35 Ill. Adm. Code 302.208 is applicable to the Ohio River and is 1 mg/l. The water quality of the Ohio River consistently exceeds 2 mg/l total iron (data from Electric as well as the Agency: Pet. at 9, Response at 4; Ag. Rec. at 4). In fact, total iron water quality ranges from 2.27 to 6.63 mg/l at river mile 952.3 at Electric's plant and from 3.9 to 5.3 mg/l at Lock and Dam 53

downstream of Electric. The total iron water quality ranges from 3.9 to 5.3 mg/l where the Ohio River flow is approximately 530,000 to 662,000 cubic feet per second. Id.

Because of the existing violations of the general use WQS for total iron in the Ohio River already upstream of the plant, the total iron contribution of Electric would be minimal if the lagoon outfall 010 discharge were allowed to continue until December 31, 1986. Thereafter, the 010 discharge and its effect on the Ohio River would be terminated under either the pump or lime addition alternatives.

In addition, the Agency contends that any heavy metals from the discharge will precipitate in the cooling water and be discharged to the Ohio River. The Agency points out that treating for pH before any mixing occurs will cause the metals to precipitate on Electric's property (Agency Rec. at 7). Electric counters by saying that the metal content of the 010 discharge are "far below the limitations specified in Section 304.124" (Response to Agency Rec. at 4). The Board believes that treatment is the superior alternative.

Hardship

Electric argues that immediate compliance with the iron and pH limitations essentially would impose an arbitrary or unreasonable hardship upon it by not only subjecting it to penalties (Pet. at 10,11) but by causing cessation of plant operations (Pet. at 11).

Electric asserts hardship because it originally rerouted the settling lagoon discharge to the cooling water bay under a 1977 USEPA agreement. Under the agreement it was understood that neutralization with the cooling water in the bay would be acceptable. Now the agreement, is no longer acceptable to the Agency (Pet. at 11). The Board notes that the applicable regulations did change since the 1977 agreement and that the Agency is responding to these changes.

While the Agency has recommended denial of the variance, the Board believes the better posture is to grant a variance from the pH and total iron effluent limitations until December 31, 1986 and to amend the compliance plan by ordering implementation of another record-supported compliance option while retaining the original compliance timetable. Should Electric believe that either the plan or the timetable is infeasible or unduly onerous, Electric may move for reconsideration to present any preferred modifications.

The Board will impose as a condition of this variance that Electric move forward with a multiple pump installation with corrosion resistant materials to enable it to eliminate lagoon

outfall 010 by pumping the effluent to the ash pond, where neutralization and metal precipitation is expected to occur. The schedule in Exhibit B of the petition, paragraph 23 will be the construction timetable. The interim pH range shall be 3.2 to 9 as requested by Electric, and fully supported by the record. The requested total iron interim limit of 8.6 mg/l (Pet. at 12) has no support in the record. The highest total iron limit in the record for lagoon outfall 010 is 4.40 (Response, Attachment 1, April 1980), which shall be the interim limit.

This Opinion concludes the Board's findings of fact and conclusions of law in this matter.

ORDER

Electric Energy, Inc. is granted a variance from the 2 mg/l total iron and 6-9 pH effluent limitations of 35 Ill. Adm. Code 304.124 and 304.125, respectively, for its settling lagoon discharge at NPDES outfall 010 at its Joppa, Illinois plant subject to the following conditions:

1. This variance begins on January 31, 1986 and expires on December 31, 1986.
2. During the variance period, the settling lagoon effluent at NPDES outfall 010 shall not be less than a pH of 3.2 or more than a pH of 9.0.
3. During the variance period, the settling lagoon effluent at NPDES outfall 010 shall not exceed 4.40 mg/l total iron.
4. Electric shall install and operate a multiple pump system, including pumps and piping, consisting of corrosion resistant materials, to enable the pumping of the settling lagoon effluent including the coal pile runoff at NPDES outfall 010 to the ash pond. Such a multiple system shall be capable of operating efficiently both during normal lagoon flow of approximately and during high flows.
5. The installation and operation of the multiple pump system described in paragraph 4 shall be according to the following timetable:
 - a) Engineering completed and permit application to Agency by: June 9, 1986.
 - b) Construction completed, facilities in place and operational: December 31, 1986.

- 6. The Agency shall issue a modified NPDES permit pursuant to 35 Ill.Adm.Code Sections 309.184 and 309.154 which is consistent with this Opinion and Order.
- 7. Within 45 days of the date of this Order, Electric shall execute and forward to the Illinois Environmental Protection Agency, Compliance Assurance Unit, Water Pollution Control Division, 2200 Churchill Road, Springfield, Illinois 62706, and to the Illinois Pollution Control Board, a Certification of Acceptance and Agreement to be bound to all terms and conditions set forth in the Order. The 45 day period shall be held in abeyance during the period in which this matter is being appealed. The form shall be as follows:

CERTIFICATION

I, (We), _____, hereby accept(s) and agree(s) to be bound by the above terms and conditions of the Order of the Pollution Control Board in PCB 85-171 dated March 27, 1986.

Petitioner

Title

By: Authorized Agent

Date

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 9th day of May, 1986, by a vote of 7-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board