ILLINOIS POLLUTION CONTROL BOARD
May 16, 1985

IN THE MATTER OF:	)	
	)	
	)	
	)	R82-7
	)	
PETITION FOR SITE-SPECIFIC RELIEF BY THE CITY OF ALTON	)	
	)	

PROPOSED RULE. FIRST NOTICE.

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

This matter comes before the Board upon the April 15, 1982 filing by the City of Alton (City) of a proposal for site-specific relief from 35 Ill. Adm. Code 304.106 (offensive discharges), 304.120(c) (10/12 mg/l BOD/TSS effluent standards), 304.121 (400 mg/l fecal coliform bacteria effluent standard), 304.124 (15 mg/l total suspended solids effluent standard), and from the combined sewer overflow (CSO) provisions at Sections 306.302 (prohibition on expansion of or new CSO service areas), 306.303 (elimination of excess sewer infiltration), 306.304 (prohibition on sanitary sewer overflows), 306.305 (treatment of overflows and bypasses) and 306.306 (compliance dates).

On May 13, 1982, the Board entered an Order seeking clarification of the proposal from the City (47 PCB 117). A merit hearing was held in Alton, Illinois on February 14, 1983. On October 12, 1984, the Illinois Department of Energy and Natural Resources filed its completed economic impact statement (EcIS) with the Board. An economic impact hearing was held in Alton on January 17, 1985. Final comments were submitted by the Agency on April 15, 1985. An engineer for the City submitted comments on April 22, 1985 concerning the operation of outfall 001, yet the City failed to provide the Board with information requested at the economic impact hearing as to whether the alternate Wood River Creek outfall was permitted by the Agency and what effect that information would have on the proposed language of the rule.

The City is faced with three problem areas: receiving stream reclassification, CSO elimination (dry and wet weather

* The Board acknowledges the work of Kevin F. Duerinck, hearing officer for this rulemaking, who assisted in drafting this Opinion and Order.

flows) and WWTP upgrade. Prior to 1982, the receiving stream for the WWTP was considered to be the Mississippi River even though it discharged into Wood River Creek (Creek) approximately 1,000 feet from the Mississippi. It is now classified by the Agency as the Creek, a low flow stream, thereby imposing more strict standards for BOD and TSS. The City requests relief from the 10/12 mg/l BOD/TSS and 15 mg/l TSS effluent standards (15 mg/l standard for the CSO discharges). The City proposes to meet the prior 20/25 mg/l standards for BOD/TSS for its WWTP discharge.

Besides reclassification difficulties, the City has a CSO problem. There are prohibited overflows from sanitary sewers to the Mississippi River. In addition, some dry weather flows, the first flush of storm flows , and ten times the average dry weather flow are not being sufficiently treated. The Mississippi River inundates certain CSO areas when the river pool level is above elevation 415.3 (Pet. 3).

Lastly to meet standards, the WWTP must be upgraded or the sewer outfall must be extended another 1,000 feet to the Mississippi River proper.

The City's wastewater treatment plant (WWTP) provides secondary treatment by the contact stabilization mode which consists of settling and aeration tanks. The WWTP was designed for a population equivalent of 105,000 people, an average design flow of 10.5 million gallons per day (MGD) and a peak design flow of 26.25 MGD. The service area includes Alton, part of Godfrey Township, and Bethalto. Discharge is to either permitted outfall 001 or to an unpermitted outfall into the Creek near the WWTP 5,000 feet from the River depending on the elevation of the Mississippi River (see Pet. Exh. 13). During normal river stages, the discharge is 4,000 feet downstream from the WWTP, which is 1,000 feet from the Mississippi River below the channel dam. Twenty percent of the time high water prevents discharge below the channel dam at outfall 001 (R. 74). Discharge is then above the channel dam at the unpermitted outfall (See Pet. Exhs. 13, 17).

Besides the WWTP discharge, the City has six permitted discharges from seven combined sewer areas (see Pet. Exhs. 1,2). There are three CSO outlets to the existing pool of Lock and Dam No. 26 (Id. #007, 006, 005) while two CSO's (Piasa, State) join at outlet #004 in the tailwater of the existing locks and dam. "The existing facilities allow overflow of untreated dry weather and storm flows during periods when the river stage below the existing dam (tailwater) is 415.3 mean sea level or higher. A sluice gate in the interceptor sewer must be closed when flood stages of the river exceed elevation 415.3 to prevent flooding of the interceptor system with river water.... Improvements resulting from the Corps of Engineers work to relocate Lock and Dam 26 will result in decreased frequency of such overflows." (Pet. 3). The average amount of CSO's discharged at outfalls 007, 006, and 005 is estimated to be 1.1 million gallons per year

(Id.). The estimated annual overflow from the Piasa-State CSO outlet is 290 million gallons per year (Id. 4). The two remaining CSO's (003, 002) discharge to an area known as the Impoundment Area. During normal river stages discharge is by gravity to the Mississippi River, but at high river stages the discharge is pumped into the river. The estimated annual overflow from these two outlets is 282 million gallons per year (Id. 5).

Before discussing the proposal and the two full compliance options, the relocation of Locks and Dam No. 26 and its effect on this proceeding will be discussed. The relocation will be performed by the U.S. Army Corps of Engineers (Corps). A new lock and dam structure will be located two miles downstream from the present structure. The relocation will change the area covered by Pool 26. The present pool has a normal elevation of 419 feet and a minimal elevation of 414 feet above mean sea level. (See Pet. Exh. 2). The tentative schedule for "completion" of the lock and dam relocation, meaning the date at which the new pool will be raised, is September 1987 (R. 98; E.R. 32). Three CSO's discharge to the present pool and will be unaffected by the dam relocation: Turner (007), Bluff (006), and Summit (005) (Pet. Exh. 2). The remaining CSO's will be affected. Outfall 004, comprised of the State and Piasa CSO's will be greatly impacted. This outfall discharges below the present dam into the tail waters. Upon dam relocation, the new Pool No. 26 would inundate the Piasa CSO because of the CSO's low control elevation (415.3 feet). The Corps' modifications to lessen this impact to the Piasa CSO will consist of construction of an eight by eleven foot new outlet sewer, relocation of the Piasa and the State Street intercepting structures, the construction of a separate outlet for the State Street sewer and other miscellaneous construction (Pet. Exh. 6, R,38-9). These improvements will be paid for by the federal government (R.91) and will reduce sanitary sewer overflow BOD by 69 percent (R36-40).

The new pool at elevation 419 will affect the impoundment area which is at elevation 403. The Central and Shields CSO's discharge to this area. A proposed Corps improvement is to relocate the pumping station to the vicinity of the twin 60 pumps. The combination of pumps in one area will combat the increased water seepage from the relief wells of the levee (R.89). As outfall 001 is below the new lock and dam, it will be unaffected.

Although there are many different ways to juggle the different control strategies to address the City's three major problems, there are basically three options for the Board to focus on. Two are full compliance options. The first is a CSO and WWTP upgrade and the second is a CSO upgrade with an extension of the WWTP outfall pipe (001) to the Mississippi River. The third option is the proposal favored by the City, which includes limited CSO improvements.

The existing system is described more fully in the petition (Pet. Exh. 14) while the City proposal is described in Petitioner's Exhibit 8. The limited CSO improvements include construction of an interceptor sewer parallel to the southside interceptor, modification of the Shields Valley regulator chamber, installation of a twelve inch interceptor between the Shields Valley and the Shields Valley/Upper Alton intercepting structures, installation of an eighteen inch force main from the southside pumping station to the WWTP, and increasing the peak pumping capacity of the southside pump station from 8.9 MGD to 13.7 MGD (Pet. Exh. 8, R. 42-3). With these improvements, combined sewer overflows would be reduced by 9.1 percent (EcIS at 3-11).

The proposed improvements will cost the City $885,600 (Pet. Exh. 9, EcIS at 5-3, ER at 12; Exh. D to EcIS) and would reduce the annual BOD discharge from the City by approximately 13 percent (Pet. Exh. 9). The EcIS calculates this to be a nine percent reduction, probably not including alternates B-1 and B-2 (EcIS, 3-11), which will be performed by the Corps (see above; references to alternates B-1,2,3 and 4 on Pet. Exh. 10 are no longer valid; R.44). The EcIS calculates that the proposal will reduce TSS discharges from the existing system by nine percent (EcIS, 3-11). Ammonia nitrogen would be reduced by 13 percent (Id.).

The two full compliance options both include alternate 4-A, which provides for a 36 inch force main and increase in pump capacity, additional screening and grit removal, clarification, chlorination, and dewatering equipment (Pet. Exh. 16, ch. 10; Pet. Exh. 7), for storage and treatment of first flush and primary treatment of ten times the dry weather flow above the first flush volume (see EcIS 3-8). The CSO's BOD and TSS discharges would be reduced by 98 percent (EcIS 3-8,-9, -10).

The first full compliance option will be designated Plan A. It consists of alternate 4-A plus an upgrade of the WWTP, including nitrification aeration, diversion and clarifier facilities, return sludge pumping station, blowers, tertiary filters and filter pumping station (EcIS 5-3) The cost for plan A would be the sum of costs for the CSO ($45,271,200) and WWTP upgrading ($9,898,800) provisions, totalling $55,000,000 (Id.). In addition to the pollutant reductions from 4-A concerning CSO discharges, WWTP BOD would be reduced by 80 percent, TSS by 93.1 percent, and ammonia nitrogen by 57 percent (EcIS 3-22).

The second full compliance option will be designated Plan B. It provides for CSO upgrade under alternate 4-A plus extension of the sewer outfall to the Mississippi River. The total cost would be the sum of the costs for the CSO improvements plus that of the sewer outfall extension, (315,000) or $45.6 million (EcIS 5-3). The 4-A CSO reductions are also present as in Plan A. Because of the extension of the WWTP outfall to the Mississippi, the upgrade provisions of Plan A are avoided. Under Plan B, the percent reductions from the WWTP are 66 percent BOD, 93.1 percent TSS, and six percent ammonia nitrogen (EcIS 3-22).

The City asserts an arbitrary or unreasonable hardship would be imposed if it had to comply with the regulations (Petition, Exh. 14, p. 13). The two full compliance options, Plan A and B, would cost the City 55.2 million and 45.6 million dollars, respectively, while the City's proposal would cost $885,000 (ER 11,12). The annual costs under the full compliance options would be 3.7 million and 2.8 million dollars while for the proposal, the annual costs would be $128,400 (Id.). If the full compliance annual costs are spread over the entire Alton service area, the residential annual sewer service charge could increase between $91 to $121 while the nonresidential charge would increase between $505 to $680 (EcIS 5-10, -11). Such charges would increase by two to 299 percent for residences of Godfrey and Bethalto depending upon which assumptions are used (Id.).

As for the environmental impact of the City's discharges, the City testified that the situation is similar to two others studied by the Illinois State Water Survey. One studied the effect of Alton's water treatment plant discharge on the Mississippi, the other analyzed the impact of Peoria's CSO's on the Illinois River (R48-9, 70-1). From the studies the City alleges that there is no evidence of sludge build-up at the overflow point and no localized effects from the CSO's (R70-1). Regarding the ammonia nitrogen concentration of the WWTP discharge in relation to aquatic populations, it is known that the average discharge concentration is approximately 2.45 mg/l while the range is 0.05 to 7 or 8 ppm (R78). The City reports that fish and other aquatic life can migrate over the dam to go upstream in the Creek only 25 percent of the year, which corresponds to the high water elevations of the Mississippi (R. 80; see photo in Pet. Exh. 17).

Evidence which addresses WQS data for the Creek is found in the EcIS at pages 4-4, 4-5. Consistent copper and iron WQS violations have occurred in addition to one silver WQS violation. Agency sampling data upstream of the Creek discharges shows a mean dissolved oxygen (DO) concentration of 8 mg/l with a range of 4.3 to 12.1 mg/l. The DO WQS was violated once in 1982. The mean pH was 7.8 with a range of 7.0 to 8.9 units. The highest ammonia nitrogen concentration during the 1981-1982 period was 0.74 mg/l while the average was less than half of that figure (EcIS 4-7).

Agency sampling data for the years 1980-1982 were obtained for the Mississippi River at its sampling station immediately below Locks and Dam 26, approximately 300 feet from the Clark Bridge (EcIS 4-17). This station is upstream of the Creek and it is not clear whether it is upstream or downstream of outfall 004 (Pet. Exh. 1). The data shows consistent WQS violations for iron, copper, and fecal coliform. Other WQS violations included two for lead and one for DO in 1980 and two for mercury in 1981 (EcIS, Table 4.2, 4-13, 4-17).

The Agency comments addressed two main concerns. First, the Agency states that the evidence in the record is insufficient to substantiate economic hardship for dry weather overflows as requested in proposed rule I. Overload of an interceptor due to river backflow into the regulatory chambers should not happen if design criteria are met. The design criteria for such facilities "requires flood protection to maintain operational capability up to a 25-year event and protection of facilities from damage against a 100-year event." (Ag. Comments 1). The evidence shows that river backflow occurs at least eleven days annually. The Agency further stated that the discharge of untreated sanitary sewage into waters of the State would violate Section 301(b) (1) (B) of the Clean Water Act [33 U.S.C. 1311 (b) (1) (B)]. The Agency would like the proposal modified to include adherence to the design criteria for such facilities and to include alternative A-2 in the rule.

The evidence of WQS violations in the Mississippi River for the fecal coliform criterion dictates that any relief given should not aggravate this situation. Therefore, the Board agrees with the Agency's amendatory language to "require the protection and maintenance of the interceptor system from Mississippi River backflow intrusion for the 25-year flood event" and to require that alternative A-2 be implemented (Ag. Comments 1,2).

The second area addressed was that the City's NPDES permit does not include the alternate discharge point which is 4,000 feet upstream of permitted outfall 001. Furthermore, the potential costs of modifying outfall 001 to handle all WWTP discharges were not discussed in the record. The Agency suggests that requested relief should only be for permitted outfall 001 and that this should be stated in the rule. The Board notes that this potential problem was raised at the economic hearing yet the City has not suggested a solution. The record is also silent as to potential water quality violations for the 4,000 feet of Wood River Creek below the alternative discharge point. Therefore, the Board will modify the proposed language to reflect the outfall distinction.

As for ammonia nitrogen relief, the Board notes that such relief has not been specifically requested in the proposal or record. Even had such relief been specifically requested in the proposal, there is inadequate data to show that the ammonia nitrogen WQS will not be violated in the Creek, especially in the 4,000 feet between the WWTP and outfall 001. Agency data was from sampling 1.6 miles upstream of outfall 001 and did not include this 4000 foot segment between the WWTP and outfall 001 (EcIS 4-4a). Therefore, the environmental impact of any ammonia nitrogen relief is uncertain and the Board hereby declines to address such relief in the Order.

In adopting the amended proposal the amounts of BOD and TSS that should be removed for full compliance will most likely end up downstream from Alton. However, the Board finds that the full compliance options are economically unreasonable although technically feasible. The Board further finds that the amended proposal is technically feasible and economically reasonable pursuant to Section 27 of the Environmental Protection Act.

The Board will grant relief from the offensive discharge regulation of Section 304.106.

The Board finds that Alton has justified the need for relief from the Board's combined sewer overflow regulations. However, the Board agrees with the Agency both that the operational capability of the regulating chambers of the interceptor system should be protected against Mississippi River backflow intrusion for the 25 year flood event and that there should be maximum utilization of the south side interceptor system, including upgrading of the interceptor pump station. The Board is specifically concerned about the need to avoid or significantly reduce the necessity to discharge flows during dry weather because of system overload and malfunction caused by river backflows. Therefore, the Board will include the Agency's operational and design recommendations as part of the rule. This will serve to assure proper utilization of the interceptor system and at the same time provide the economic relief justified by Alton.

The Board notes that the City did not comment on the Agency recommendation, and therefore, presumes that the City finds the recommendation acceptable. In addition, the environmental impact data provided by the City is barely adequate to support the relief granted. The Board realizes that the proposed rule at first notice is somewhat different than envisioned by the City. Comments on the proposed rule may be submitted during first notice.

The following language as set out in the Order will be incorporated into 35 Ill. Adm. Code 304.210. The City of Alton will be required to comply with the new section upon the filing of the rule with the Secretary of State.

ORDER

Section 304.210 Alton CSO and Wastewater Treatment Plant Discharges

This Section applies to the combined sewer overflows and the existing wastewater treatment plant of Alton, Illinois.

a) The discharge from the Piasa-State Street Sewer, defined as being at Mississippi River mile 202.64, shall not be subject to the provisions of Sections 304.106, 304.120, 304.121 and 304.124 during the following conditions:

1) Prior to replacement of the existing Locks and Dam 26, when the tailwater elevation exceeds 415.3, or

2) After replacement of Lock and Dam 26, when the pool level at the Piasa-State Street Outlet exceeds the 25-year flood stage at river mile 202.64.

b) Discharges from the City of Alton at Mississippi River miles [illegible].66 (Shields Valley), 202.24 (Central Avenue), 202.64 Piasa-State Street), 203.6[illegible] (Summit Street), 203.87 Bluff Street) and 204.30 (Turner Tract), shall be subject to the following conditions:

1) The overflow structures and the associated interceptor sewer shall be protected against intrusion by flood waters and be maintained operational at flood stages from Mississippi River backflow for a 25-year Mississippi River flood stage;

2) The City of Alton shall achieve and maintain maximum transport capability of the south side interceptor sewer system; and

3) The south side interceptor pump station shall be upgraded to a design capacity of 13.7 MGD.

c) The discharge from the City of Alton's sewage treatment works outfall 001 sewer located on Wood River Creek, approximately 1,000 feet from its confluence with the Mississippi River, shall not be subject to 35 Ill. Adm. Code 304.120(c) but shall be subject to the following: shall not exceed 20 milligrams per liter BOD and 25 milligrams per liter suspended solids. Compliance shall be determined consistent with 35 Ill. Adm. Code 304.120(e).

35 Ill. Adm. Code 304.210 is directed to First Notice.

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 16th day of May, 1985 by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board