ILLINOIS POLLUTION CONTROL BOARD
May 9, 1986

IN THE MATTER OF:	)	
	)	
THE JOINT PETITION OF THE CITY	)	
OF ROCK ISLAND AND THE ILLINOIS	)	PCB 85-214
ENVIRONMENTAL PROTECTION AGENCY	)	
FOR EXCEPTION TO THE COMBINED	)	
SEWER OVERFLOW REGULATIONS	)	

MR. ROY HARSCH APPEARED ON BEHALF OF THE CITY OF ROCK ISLAND

MR. THOMAS DAVIS APPEARED ON BEHALF OF THE ENVIRONMENTAL PROTECTION AGENCY

OPINION AND ORDER OF THE BOARD (by R. C. Flemal):

This matter comes before the Board upon a joint petition for a combined sewer overflow (CSO) exception filed pursuant to 35 Ill. Adm. Code, Subtitle C, Chapter I, Part 306, Subpart D, by the City of Rock Island ("Rock Island") and the Illinois Environmental Protection Agency ("Agency"). Petitioners specifically request exception from 35 Ill. Adm. Code 306.305(a) and 306.305(b).

The Board conducted a public hearing in Rock Island on March 3, 1986. In addition to testimony presented by the Joint Petitioners, testimony in support of the requested relief was presented by Ms. Emily Smith, chairperson of the Rock Island Facilities Study Jury of Experts. The Jury of Experts consists of thirteen citizens, representing a cross-section of community interests, who have followed the progress of all phases of the CSO program for several years.

CSO REGULATIONS

The CSO regulations are contained in 35 Ill. Adm. Code, Subtitle C, Chapter I, Part 306. They were amended in R81-17, 51 PCB 383, March 24, 1983. Section 306.305 provides as follows:

> All combined sewer overflows and treatment plant bypasses shall be given sufficient treatment to prevent pollution, or the violation of applicable water standards unless an exception has been granted by the Board pursuant to Subpart D.

Sufficient treatment shall consist of the following:

a) All dry weather flows, and the first flush of storm flows as determined by the Agency, shall meet the applicable effluent standards; and

b) Additional flows, as determined by the Agency but not less than ten times to average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection with adequate retention time; and

c) Flows in excess of those described in subsection (b) shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and solids in accordance with 35 Ill. Adm. Code 302.203, and to prevent depression of oxygen levels; or

d) Compliance with a treatment program authorized by the Board in an exception granted pursuant to Subpart D.

Subpart D allows the discharger to file a petition for an exception either singly, or jointly with the Agency, as Rock Island has done. A joint petition may seek an exception based on minimal discharge impact as provided in Section 306.361(a):

> An exception justification based upon minimal discharge impact shall include, as a minimum, an evaluation of receiving stream ratios, known stream uses, accessibility to stream and side land use activities (residential, commercial, agricultural, industrial, recreational), frequency and extent of overflow events, inspections of unnatural bottom deposits, odors, unnatural floating material or color, stream morphology and results of limited stream chemical analyses.

Rock Island and the Agency believe they have made the "minimal impact" showing pursuant to Section 306.361(a).

SUPPORT DOCUMENTS

Rock Island has undertaken several studies of its CSO situation, the reports of which have been submitted as exhibits in support of the petition. The principal among these is the Rock Island, Illinois Combined Sewer Overflow Study, prepared by Missman, Stanley & Associates, dated May, 1982, and submitted as Exhibit 2 (referenced as Exhibit B in Joint Petition). This document is augmented by two other Missman, Stanley & Associates studies, a response supplement to the IEPA review letter dated August, 1983 (Ex. 1; referenced as Exhibit A in Joint Petition),

and Proposed Plan for POTW and Transport Improvements for Joint CSO Exception dated September, 1984 (Ex. 5; referenced as Exhibit E in Joint Petition). These studies consider, among other matters, description of the Rock Island sewage transport and treatment system, characterization of alternate control mechanisms, determination of the quantity and quality of CSOs,and assessment of the impact of the overflows on the Mississippi River.

A fourth major document submitted as Exhibit 3 (referenced as Exhibit C in Joint Petition) was prepared by James E. Huff, P.E., and deals with CSO effects on stream bottom sediments. The record before the Board also contains several exhibits submitted in support of particular aspects of the testimony presented at hearing.

BACKGROUND

The City of Rock Island, which has a population of 46,862 (1980 census), is located in northwestern Illinois on the Mississippi and Rock Rivers. Rock Island owns and operates its own system of sewers and waste treatment plants. The system includes approximately 170 miles of sewers. It also includes two treatment plants, the Main Plain and the Southwest Plant. Only the Main Plant and its tributary sewer system are the subject of the joint petition. The Main Plant is served by two major interceptor sewers, the North Slope Interceptor and the South Slope Interceptor.

As with many older cities in the Midwest, Rock Island originally constructed combined sewers to convey both municipal sewage and stormwater. Between 1970 and 1979 Rock Island undertook a $6.9 million program to separate combined sewers serving about 2,830 acres of the 5,600 acres tributary to the Main Plant (R. at 10). At present approximately 17% of the area tributary to the Main Plant (970 of 5,600 acres) remains combined. The combined areas are located in the north-central section of the city (Ex. 10), and correspond with the principal commercial areas of the community (Ex. 2, Table 1) where separation would be most difficult and expensive (R. at 11).

The requested exception concerns six outfall structures: outfall 001A is a bypass located at the Main Treatment Plant; outfalls 002-006 are overflows from the North Slope Interceptor. Outfall 001A discharges directly to the Mississippi River. Outfalls 002-006 discharge in the lower reaches of Sylvan Slough, a high-velocity side channel of the Mississippi River which has been developed as a race-way for a hydroelectric plant located upstream from the CSO discharges (R. at 59).

The Main Treatment Plant consists of two parallel grit removal chambers, eight primary settling tanks, the complete mix activated sludge process, two secondary clarifiers, and chlorination facilities. The plant has an 8 million gallons per day ("mgd") design average flow capacity and a 16 mgd maximum flow capacity. The North Slope Interceptor is a ninety-six inch sewer with a full pipe capacity of 204 mgd.

As conditions associated with granting of the requested exception, Rock Island agrees to undertake certain modifications to its system. These involve the construction of head works improvements to allow operation of the treatment plant at the design maximum level of 16 mgd and improvements to the North Slope Interceptor to assure that maximum available transport capacity will be utilized prior to overflow events. The modifications consist of (1) improvements to the screening system at an estimated installation cost of $75,000, (2) interceptor chamber modifications at an estimated cost of $23,000, and (3) increase in elevations of diversion weirs at an estimated cost of $3,000. The agreed to improvements thus aggregate to a total estimated cost of $101,000. The improvements are further detailed in Exhibit 5.

DOCUMENTATION OF MINIMAL IMPACT

The Mississippi River in the reach of the CSO and the bypass outfalls has recreational use for boating and fishing (R. at 22); small boating use is characterized as "heavy" (R. at 28). Some water skiing does occur, but the amount of swimming which occurs is not addressed in the record (R. at 29). The river, but not Sylvan Slough, is also used for commercial barge traffic. The nearest downstream known withdrawal of water for public water supply is at Muscatine, Iowa, approximately 25 miles downstream.

Access to the river in the vicinity of the CSOs and bypass is limited. Through most of the reach in question the community is separated from the river by a levee which does not have any point of public access (R. at 21). Land between the levee and the river is variously barren sand flats, rock flats, and/or woods which range in width up to 150 yards, depending in part on river stage (R. at 21-8). Additionally, much of the landward side of the levee is occupied by industrial land of limited access.

From March to August of 1980, an overflow monitoring and sampling program was conducted to collect basic data on the quantity and quality of the CSO overflows. This program consisted of measuring flow at the six discharge points with continuous flow meters, monitoring of the length of time the Main Plant pumps directed discharge to outfall 001A, sampling of water quality, and physical inspection of the five CSO discharge points.

Data from the 1980 monitoring and sampling program was utilized, along with historical rainfall data, to estimate the number and volumes of overflow events that could be expected in an average year; the estimation was done utilizing the computer program, Simplified Storm Water Management Model (SSWMM). This analysis indicates the following number and volumes of events from each discharge point per year (Ex. 11):

OUTFALL	NUMBER OF EVENTS	VOLUME (mg/year)
001A	103	697.2
002	16	12.5
003	24	7.6
004	50	10.3
005	40	79.3
006	50	9.6

These data indicate that bypass 001A can be expected to discharge approximately 700 million gallons from 103 events during the average year. Similarly, the five other CSOs can be expected to discharge approximately 120 million gallons during approximately 50 events per year (R. at 36-7). The 120 million gallon figure would be reduced by 20% and the number of events decreased to 40 per year if the improvements as agreed to by Petitioners are implemented (R. at 43).

Not all of the 700 million gallons discharged at 001A is derived from the combined sewer system. Due to the particular configuration of the Main Plant (Ex. 19), some separated storm sewer discharges are directed through outfall 001A (Ex. 19). It is estimated that about 1/3 of the 700 million gallons derives from separated storm sewers (R. at 73).

Similarly, some of the 103 annual events estimated for outfall 001A are apparently triggered by infiltration into the separated storm sewer system rather than by storm surcharging of the combined sewer system (R. at 55, 61-71). The pumps at 001A are afixed to wet wells which receive flow from both the storm and sanitary sewer system (Ex. 19). The filling of these wet wells causes the pumps to activate and drain the wells via the outfall. The record is unclear as to what percentage of the 103 events are related to simple emptying of the wet wells. At one point it is surmised that infiltration is responsible for causing the wells to fill and discharge approximately 20 to 30 times per year (R. at 49-50). Later in the record it is indicated that these could constitute "the majority" of the pumping events at 001A (R. at 61), and that they constitute approximately half of the 103 events (R. at 76). Petitioners have presented testimony that during 1985 there were only seven occurrences of bypasses at 001A which were occasioned by flow to the Main Plant exceeding the plant's 16 mgd design maximum flow (R. at 105).

In comparing the volumes of the CSOs to the flow in the receiving stream, Petitioners note that the mean daily discharge of the Mississippi River at Rock Island is 31,085 mgd, and that the ten-year seven-day low flow is 8,900 mgd (Petition, par. 12). In contrast, an overflow event of a one-year frequency would discharge about 52.7 million gallons (Petition, par. 12). Thus, if the one-year recurrence interval discharge were to occur at the time of average flow in the Mississippi, it would be subject to a receiving ratio of 590:1; if it occurred at the time of the ten-year seven-day low flow it would be subject to a mixing ratio of 169:1.

Chemical analyses of the CSO discharges as conducted in 1980 included the following parameters: biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total dissolved solids (TDS), ammonia nitrogen, phosphorous, and lead. Volume analysis indicated that the six CSOs in combination make an average annual contribution of 0.6 million pounds of BOD and 4.5 million pounds of TSS to the Mississippi River. Over 80% of these contributions are discharged from at the Main Plant via 001A due to the larger volume, number of events, and pollutant loadings at that point (R. at 37). Given the high flows of the Mississippi River, Petitioners conclude that "the Rock Island CSOs by themselves have a negligible effect on the Mississippi River water quality" (Petition, par. 12; Ex. 2, p. 176).

In a more recent study (Huff Study, Ex. 3), assessment was made of the impact of Main Plant outfall 001A* on bottom sediments. The assessment was undertaken through independent sampling of the bottom sediments and by analysis of previous sampling data collected by the Agency in July 1984, and by Missman, Stanley & Associates in May, 1985. All samples were subjected to chemical analysis as well as physically inspected. Samples were analyzed for lead, zinc, oil and grease, volatile solids, and total solids. In addition, the samples were ranked blind by three individuals for odor intensity.

The Huff Study found that discharges from the bypass CSO has resulted in a limited area along the near shore of the river with elevated pollutant levels. This area is approximately five hundred feet in length by fifty feet in width. To provide perspective to the levels of pollutants as found, Huff compared the observed levels to those recorded in a general Agency study of bottom sediments collected from sites downstream of sewage treatment plants (Ex. 16). In the case of CSO 001A all mean values of observed constitutents are below the mean values found

*There is no sedimentation below the five North Slope Interceptor CSOs, where the river bottom consists of solid rock.

by the Agency in the general survey of sediment collected within one mile of wastewater treatment plant outfalls. On this basis, Huff concludes that the "impact from the existing Rock Island combined sewer overflows on the Mississippi River is not discernible based upon these sediment results in the zone of impact" (R. at 84).

To further assure that the CSOs have minimal environmental impact, Rock Island has agreed, as a condition to granting of the exception, to implement a one-year shoreline inspection program. This program is intended to quantify and document the amount of debris attributable to the CSOs (R. at. 16).

ECONOMIC HARDSHIP

Rock Island has determined preliminary cost estimates for full compliance with Section 306.305(a) and 306.305(b). Under these rules Rock Island would be required to provide complete treatment for the first flush of storm flows. An additional ten times the average design dry weather flow would require primary sedimentation and disinfection. The Petitioners believe that these requirements would necessitate, as the least expensive option, the provision of below ground, covered, off-line storage facilities to capture and reduce the occurrence of overflows or plant bypasses. These storage facilities would operate in integration with the main treatment plant, and would allow for total capture and subsequent secondary treatment of the first flush. Additionally, full compliance would require upgrading the Main Plant to allow attainment of current design standards for treatment plant components and hydraulic capacity (Petition, par. 4).

In aggregate the full compliance alternative was estimated in 1982 to cost $25.2 million, and the annual operation and maintenance costs were estimated to be $3.7 million (Ex. 2, p. 181). Later figures, as set forth in Exhibits 1 and 12, raise these figures to a total of $54.9 million in capital costs and $6.9 million in operating costs under the assumption that total suspended solids control would also be required. The latter amounts would be "slightly lower if treatment based upon biological (sic) oxygen demand (BOD) was required" (Petition, par. 4). At hearing Mr. Robert T. Hawes, City Engineer of Rock Island, further testified that the cost of full compliance is estimated to be $54,330,000, and if these costs were spread over a 20 year period at an interest rate of 8%, the average residential sewer use charge would increase from $3 charge would increase from $37.21 to $103.90 per quarter.

DISCUSSION OF ORDER

The Board determines that Petitioners have shown pursuant to 35 Ill. Adm. Code 306.361(a) that exception to 35 Ill. Adm. Code 306.305(a), as it relates to first flush of storm flows, and to 35 Ill. Adm. Code 306.305(b) would produce minimal impact on the receiving stream. Accordingly, the Board will grant the exception. The Board further will accept the conditions as agreed to by Petitioners.

The Board notes that the Agency has emphasized that its support of this petition is predicated on the assumption that the relief is restricted only to those substantive requirements for effluent treatment of CSOs, and not to relief from water quality standards (R. at 94). Rock Island appears to have been aware of this condition, and has not objected to it. The Board itself notes that up to the present time, the United States Environmental Protection Agency has indicated that only variance (i.e. non-permanent) relief from water quality standards can be granted consistent with the Clean Water Act (see document entitled "Status Report on Discussions with USEPA", dated October 4, 1985; this document is part of the record of, and is cited in, Borden Chemical Company v. Illinois Environmental Protection Agency, PCB 82-82, ... PCB ....., December 5, 1985). To assure that this issue is clear, the Board will introduce into the Order, as proposed by Petitioners, language identifying the scope of the exception as granted.

ORDER

1. The City of Rock Island is hereby granted an exception from the treatment requirements of 35 Ill. Adm. Code 306.305(a), as such provision relates to first flush of storm flows, and from 35 Ill. Adm. Code 306.305(b), subject to the following conditions:

   a. Such exception shall be limited to combined sewer outfalls 002, 003, 004, 005, and 006 and to bypass 001A, as identified in this proceeding.

   b. The City of Rock Island shall implement all modifications to its sewer system as identified in paragraphs 14, 15, and 16 of the petition in this proceeding.

   c. The City of Rock Island shall implement the shoreline inspection program described in paragrpah 15 of the petition in this proceeding.

2. This grant of exception does not preclude the Agency from exercising its authority to require as a permit condition a) a CSO monitoring program sufficient to assess compliance with

this exception and any other Board regulations, including Section 306.305(c); and b) other controls if needed for compliance, including compliance with water quality standards.

3. This grant of exception is not to be construed as affecting the enforceability of any provisions of this exception, other Board regulations, or the Act.

4. Within forty-five days of the date of this Order, the City shall execute a Certification of Acceptance and Agreement to be bound to all terms and conditions of the exception granted. The Certification shall be submitted to the Agency at 2200 Churchill Road, Springfield, Illinois, 62706. The forty-five day period shall be held in abeyance during any period that this matter is being appealed. The form of said Certification shall be as follows:

CERTIFICATION

I, (We), _____, having read the Order of the Illinois Pollution Control Board, in PCB 85-214, dated May 9, 1986, understand and accept the said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

_____
Petitioner

_____
By: Authorized Agent

_____
Title

_____
Date

IT IS SO ORDERED.

Board Members Joan Anderson and Jacob D. Dumelle concurred.

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