

ILLINOIS POLLUTION CONTROL BOARD
February 3, 1994

IN THE MATTER OF:)
)
PETITION OF THE U.S. ARMY ENGINEER) R92-17
DISTRICT, ROCK ISLAND, FOR A DREDGED) (Rulemaking)
MATERIAL PLACEMENT REGULATION)
APPLICABLE TO THE ILLINOIS RIVER/)
WATERWAY BETWEEN LA GRANGE LOCK AND)
DAM (MILE 80.2) AND LOCKPORT LOCK)
(MILE 291): 35 ILL. ADM. CODE 303.400)

Adopted Rule.

Final Order.

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

This matter comes before the Board on filing of a regulatory petition by the U.S. Army Engineer District, Rock Island (Department of the Army). Petitioner requests adoption of a regulation that allows for disposal of dredged material along the bankline of the Illinois River\Waterway¹ at locations between the La Grange Lock and Dam located at river mile 80.2 to the Lockport Lock located at river mile 291.0.

The Board's responsibility in this matter arises from the Illinois Environmental Protection Act (Act) (415 ILCS 5/1 et seq.). The Board is charged under the Act to "determine, define and implement the environmental control standards applicable in the State of Illinois" (Act at Section 5(b)). More generally, the Board's rulemaking charge is based on the system of checks and balances integral to Illinois environmental governance: the Board bears responsibility for the rulemaking and principal adjudicatory functions, whereas the Illinois Environmental Protection Agency (Agency) is responsible for the principal administrative duties. The latter's duties include administering the regulations that result from today's action.

By today's action the Board adopts the Department of the Army's proposal. The regulations will now be forwarded to the Office of the Secretary of State and be effective upon receipt by that office.

¹ The "Illinois Waterway" is defined statutorily in the Illinois Waterway Act at 615 ILCS 10/1 as a waterway from Lockport to a point on the Illinois River near Utica. The focus of today's proposal includes this waterway and the Illinois River.

PROCEDURAL HISTORY

The Department of the Army's petition was filed on September 3, 1992. On September 17, 1992 the Board issued an order accepting the petition. The Board at the same time noted that because the proposal addresses potential actions in several counties over a significant portion of the State, two public hearings would be needed pursuant to Section 28 of the Act.

On January 21, 1993 the Metropolitan Water Reclamation District of Greater Chicago filed a public comment in which it recommended adoption of the proposed regulations. On June 4, 1993 the Agency filed a response to the petition². The Agency recommended adoption of the proposal with some generally non-substantive modifications.

Public hearings were held before Hearing Officer Michelle C. Dresdow on June 22, 1993 in Peoria, Illinois, and on June 23, 1993 in Morris, Illinois³. Members of the public attended the hearings and participated in questioning of the proponents at the Morris hearing.

On June 30, 1993 the hearing officer issued an order setting the post-hearing comment period. In the same order the hearing officer set out for comment possible language for the proposed rule.

In mid-July 1993 both the Department of the Army and the Agency filed motions to extend the close of the post-hearing comment period. Both observed that key personnel were then engaged full-time in flood emergency work. By order of July 26, 1993 the hearing officer set the post-hearing comment period to close on August 30, 1993.

On July 21, 1993 the Department of the Army filed corrections to the transcripts of the two hearings. The hearing officer by order of August 2, 1993 directed that the corrections be entered into the record.

² The Agency's response was submitted as one of the documents within the Agency's pre-hearing submission package. The response was officially entered into the record at hearing as Exhibit L.

³ Transcripts of the two hearings are cited to herein as "Tr1." and "Tr2.", respectively. Presubmitted written testimony of witnesses for the Department of the Army was entered into the record as if read and assigned exhibit numbers as follows: Billy H. Johnson, Exhibit F; Richard Baker, Exhibit G; Clinton A. Beckert, Exhibit H; David W. Moore, Exhibit I; and James A. Stiman, Exhibit J.

On August 30, 1993 the Department of the Army filed its post-hearing public comment (PC #2). On September 13, 1993 the Agency and the Department of the Army filed a joint public comment (PC #3) including a stipulation regarding language for the proposal rule; the comment was accompanied by a motion to file instanter, which is hereby granted. On September 20, 1993 the Agency and the Department of the Army filed a correction to the stipulation (PC #4).

By opinion and order of September 23, 1993 the Board adopted the Department of the Army's proposal for first notice. First notice publication occurred at 17 Ill Reg. 16734 (Oct. 8, 1993).

The Department of the Army's proposal was adopted for second notice by opinion and order of December 2, 1993. The second notice proposal was unmodified from the first notice proposal except in response to public comments filed during the first notice public comment period.

By PC #5 the Illinois Department of Commerce and Community Affairs filed notice that the proposal did not significantly impact small business. By PC #6 the Administrative Code Division of the Office of the Secretary of State gave notice of two non-substantive changes necessary to conform the text of the rule to administrative code format; these changes were incorporated into the second notice proposal.

On November 23, 1993 the Agency filed a public comment (PC #7) noting that the parameters listed in the proposed language at Section 303.400(b) did not conform to the parameters for which exception was intended to be granted as discussed at pages 5 and 6 of the first notice opinion. (See also PC #4 and #7 where the parties agree to the proposed parameters.) In particular, the former did not include mercury and total copper. The Agency again recommended that mercury and total copper be specified at Section 303.400(b). In its second notice opinion the Board noted its agreement with the Agency that justification for the inclusion of mercury and total copper in Section 303.400(b) had been made; the amendments were accordingly made.

On January 11, 1994 the Joint Committee on Administrative Rules voted no objection to adoption of the proposed rules.

BACKGROUND

The Illinois River/Waterway is subject to sedimentation as the consequence of normal fluvial processes. This sedimentation does on occasion and at local sites threaten navigation by causing the channel to become narrow or shallow.

The Department of the Army is charged by Congress with maintaining a nine-foot navigation channel on the Illinois

River/Waterway. Among other matters, maintenance involves dredging of accumulated sediment as necessary to restore the channel to proper navigational dimensions.

The Department of the Army explains its dredging program as follows:

While occasional emergency dredging operations may result from grounding of a barge and consequential channel closures, usually the need to dredge a particular area is identified by survey crews which perform soundings throughout the navigation season. Based upon results of the soundings, dredging sites are prioritized and scheduled typically days to weeks in advance. Because tens of thousands of cubic yards of river bottom material must be moved at most dredge sites, the only technique which is effective and economical is hydraulic dredging. Hydraulic dredges consist of a floating plant having a cutter head which is lowered to the bottom of the river and digs into the sediment. A large pump producing a suction on one side and pressure on the other draws a mixture of sediment and water to the surface and transports it via a pipeline to the disposal site, up to a mile away. The slurry which is formed during the dredging process consists of 10%-20% solid material and 80% to 90% entrained river water. Thus, for every cubic yard of bottom material moved, 5-10 cubic yards of slurry is created. (Petition, p. 3-4.)

Each dredging operation is assessed prior to its initiation. The assessment process includes sampling and surveying of the proposed dredge materials and proposed disposal site by the Department of the Army.

Additionally, an environmental assessment of each dredging/disposal operation is made by an On Site Inspection Team (OSIT) consisting of personnel from both state and federal agencies⁴. The OSIT reviews each proposed site in the field and makes recommendations, including recommendations for placement of the dredged material so as to minimize any impact on backwaters, wetlands, and other sensitive habitats. (Exh. A at 3-1; Exh. G. at 15.) The Department of the Army must notify the OSIT of any departures that it makes from the OSIT recommendation. The OSIT

⁴ The state agencies are the Illinois Environmental Protection Agency, Illinois Natural History Survey, Illinois Department of Conservation, and Illinois Department of Transportation, Division of Waterways. The federal agencies, in addition to the Department of the Army, are the U.S. Fish and Wildlife Service and the U.S. Environmental Protection Agency. (Petition at 7; Exh. A. at 3-1; Exh. G at 15.)

also holds a post-disposal inspection of each year's dredged material placement sites. (Exh. A at 3-2.)

The Department of the Army has been conducting bankline disposal on the Illinois river system pursuant to a series of variances granted by the Board, the most recent of which was granted in PCB 92-107 on October 1, 1992⁵. This current variance will, by its terms, terminate on the effective date of the instant rules.

As conditions to the grant of the several variances the Department of the Army has been required to gather and analyze data regarding environmental impact of its bankline disposal practices. These data form part of the support for today's action.

The dredging operations of the Department of the Army are also governed by a variety of federal and state regulations and policies. (See Exh. A at 2-3 to 2-9 for a comprehensive list.) Among the more important of these is the National Environmental Policy Act of 1969, the Corps of Engineers Dredging Regulation (see Exh. D, 33 CRF Parts 335-338.), and the federal Clean Water Act.

NATURE OF TODAY'S RULES

Today's rules are directed solely to the disposal of sediment generated by the Department of the Army during maintenance dredging on the Illinois Waterway/River between river miles 80.2 and 291. Moreover, today's rules are directed solely to disposal of that sediment via bankline deposition; no other form of disposal, including upland deposition or open-water disposal, is included.

Under the terms of today's rules bankline disposal is permissible only if the Department of the Army holds a 401 water quality certification from the State and the disposed sediment is dominated by sand, or there is a demonstration by use of the SSTFATE (suspended sediment transport fate) model that no water quality standards will be violated outside of an area of allowed mixing. Specifically, bankline disposal is permissible only if:

⁵ Department of the Army v. Illinois Environmental Protection Agency (Oct. 1, 1992), PCB 92-107, 136 PCB 233. Prior variances were granted in Army v. IEPA (May 21, 1992), PCB 91-113, 133 PCB 475; Army v. IEPA (Sept. 17, 1987), PCB 87-38, 81 PCB 257; Army v. IEPA (Oct. 25, 1984), PCB 84-86, 60 PCB 365; and Army v. IEPA (July 26, 1983), PCB 83-25, 53 PCB 81.

- 1) less than 10% of representative samples from a proposed dredge cut are composed of fine-grained material⁶, or
- 2) the SSTFATE model indicates that applicable water quality standards will be met at the perimeter of a temporary area of allowed dilution having an area of no more than 48,000 feet.

As a further term of today's rules, when and where bankline disposal is permissible, the Department of the Army is not be subject to 35 Ill. Adm. Code 304.105 as a result of bankline disposal. Section 304.105 is a provision of the Board's effluent regulations⁷ that in pertinent part establishes that "no effluent shall, alone or in combination with other sources, cause a violation of any applicable water quality standard". The "applicable water quality standards" are identified as those that occur at 35 Ill. Adm. Code 302.203, Offensive Conditions; 35 Ill. Adm. Code 302.206, Dissolved Oxygen; 35 Ill. Adm. Code 302.208, Numeric Standards for Chemical Constituents, only to the extent that it concerns the standards for total lead, total zinc, total copper, and total mercury; and 35 Ill. Adm. Code 302.212, Ammonia Nitrogen and Un-ionized Ammonia.

DISCUSSION

Water Quality Considerations. Bankline disposal consists of placement of dredge slurry along the riverbank, with part of the material being placed on the bank above the waterline and the remainder of the material placed in the adjacent water. (Exh. G at 10.) During and following disposal some of the water entrained in the slurry re-enters and becomes part of the river flow. The entrained water carries with it some suspended and dissolved solids that are potential pollutants of the river, and thus have water quality consequences.

There are no current Illinois water quality regulations that expressly apply to bankline disposal of dredged sediment. However, bankline disposal, like activities in general that may impact water quality, is subject to the prohibition against causing water quality violations found at Section 304.105 of the Act. Thus, a person conducting bankline disposal is potentially

⁶ A sample is fine-grained if more than 20% of the sample passes a number 230 sieve. A number 230 sieve will retain material greater than 62 microns in nominal dimension and pass material smaller than 62 microns. 62 microns is the division between silt- and clay-sized particles.

⁷ 35 Ill. Adm. Code Part 304.

liable for water quality violations associated with return of the entrained water.

Both the Department of the Army and the Agency conclude that impact on water quality of bankline disposal is minimal. This conclusion is based on the limited area over which bankline disposal has impact, the limited numbers of parameters which are potentially involved, and the ability to successfully predict, and hence minimize, the circumstances where the impact would be greatest.

The Agency also observes that bankline disposal is possessed of mitigating factors, including (a) no new pollutants are introduced into the river, (b) the discharges are of short duration and thus there are no chronic toxicity effects to consider, and (c) the present dredging procedures have been utilized for many years without obvious adverse impacts (i.e., fish kills). (Exh. L at ¶8.)

Sediments that are subject to dredging are dominantly within the sand and silt size-range. Pursuant to conditions attached to the previous grants of variance, the Department of the Army has since 1983 conducted a systematic determination of sediment particle sizes from locations along the river where dredging has been required. The principal measurement has been the percentage of the sample that passes a number 230 sieve⁸, and thereby are clay-sized particles. In the most recently reported tabulation of 1,118 total samples, 75 percent contained less than 20 percent clay, 20 percent contained between 20 and 80 percent clay, and 5 percent contained 80 percent or more clay. (Tr1. at 36.)

Most of the sand-sized particles remain at the point of bankline deposition or travel only relatively short distances. Thus, these contribute to suspended sediment problems over only a limited area.

450 of the samples subjected to particle-size analysis have also had elutriate testing performed on them by the Department of the Army. Constituents tested have included arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, ammonia, oil and grease, biochemical oxygen demand, and polychlorinated biphenyls. (Exh. H at 4.) Only ammonia and zinc elutriate concentrations have been above stream water quality standards. This was the case in approximately 50% of the ammonia elutriate samples and 3% of the zinc elutriate samples. (Id. at 7.)

The ability to predict water quality consequences is dependent upon use of the SSTFATE model. This model has been developed by the U.S. Army Corps of Engineers Waterways

⁸ See footnote 6.

Experiment Station at Vicksburg, Mississippi, and specially modified to address bankline disposal on the Illinois River. (Exh. F at 7.)

The SSTFATE model has also been calibrated and verified for conditions on the Illinois River. Calibration was based on a preliminary dye study (Exh. C-1), which allowed determination that the majority of sediment was transported as a density flow near the bottom of the river well away from shore (Tr1. at 23), and data gathered during dredging at Quiver Island (river mile 121). The model has subsequently been verified with data gathered during dredging at three separate river sites⁹.

Calibration is based on the assumption that 100% of the sediment deposited at the bankline re-enters the water. (Tr1. at 28-30.) This is a conservative assumption in that it tends to cause overestimation of the actual water quality impacts. The choice of Quiver Island as a calibration site is also a conservative selection in that the Quiver Island sediments are finer-grained than normal (Tr1. at 23, 34) and of poorer chemical quality than normal (Tr1. at 38-39).

The SSTFATE model predicts not only suspended sediment concentration, but also chemical concentrations. Of interest in the instant matter are six chemical parameters: dissolved oxygen, ammonia, and four metals. The parameters have been selected as being those for which the water quality standards are most likely to be locally exceeded due to bankline deposition, as based on the experience of both the Agency and the Department of the Army (Tr1. at 43), including experience gained from elutriate testing. A dissolved oxygen problem is most likely to be caused by high oxygen demands associated with pore-waters and organic fractions of the dredged sediments. An ammonia problem is also most likely to be related to pore-water and organic fraction conditions. The four metals are metals whose concentration typically correlates strongly with suspended sediment concentration, and for which there is an historical record of elevated concentrations in dredge slurries. (Tr1. at 43-46.)

For each of the six chemical parameters there is typically a strong correlation between fineness of particle size and chemical quality of the associated waters¹⁰. (Exh. H. at 8.) Moreover,

⁹ At Deer Park Light at river mile 228 (Exhibit C), and at Quiver Island at river mile 120.0 and Pekin Bend at river mile 150.5 (Tr2. at 13-14; Supplement to Data Exhibit C-2).

¹⁰ Since metals are commonly measured as "totals" (e.g., total lead), significant portions of the reported concentrations may be in the form of very-fine particulate matter rather than being in solution. This fact in part underlies the grain-size/concentration correlation.

since fine-sized materials experience the most broad dispersion, the prospect of both high and broadly distributed water quality exceedences increases in proportion to the percent of fine-grained material in the dredging slurry.

That ammonia is likely to be the most troublesome of the chemical constituents is confirmed by general experience with Illinois River sediments and by the Department of the Army's elutriate analyses; the Department of the Army has also conducted bioassays on elutriates and sediments (Exh. C-3 and I) that affirm ammonia toxicity in some of the undiluted samples. However, field and modeling results also show that ammonia concentrations fall rapidly upon mixing with river waters (see, e.g., Exh. C-2 and Supplemental data to C-2). Thus, ammonia toxicity, if it occurs at all, is likely to be confined to a small zone of mixing; by the nature of the dredging disposal operation itself, the toxicity would also not be expected to be persistent. The absence of known examples of aquatic kill-offs during the long history of bankline disposal on the Illinois River gives weight to the conclusion that bankline disposal does not cause significant toxic aquatic effects in spite of the ammonia analyses record.

Nevertheless, the Department of the Army and the Agency agree, and the Board concurs, that bankline disposal of fine-grained material should take place only if there is a prior SSTFATE model demonstration that the water quality standards will not be exceeded beyond the bounds of the zone of allowed mixing.

In balance, the Board believes that limiting bankline disposal to coarser sediments, unless there is an affirmative demonstration of minimal water quality impact via the SSTFATE model, further serves the public interest by providing reasonable assurance that only relatively clean sediments are bankline disposed.

The Board has also addressed the issue of environmental impact of bankline disposal in each of the previous variance proceedings¹¹. There the Board has consistently found that the anticipated adverse environmental consequences are outweighed by the arbitrary and unreasonable hardship that would be imposed upon the Department of the Army and upon commerce if dredging and hence navigation were significantly impeded. Although the standard of review is different in the instant regulatory proceeding than it is in a variance proceeding, the Board again in this proceeding concludes that the balance between minimal environmental impact and large potential economic losses favors granting of the requested relief.

¹¹ See footnote 5.

Economic Considerations. Annual commodity shipments on the Illinois Waterway exceed 41 million tons, with a total value of approximately \$4.5 billion. (Petition at 10.) Major commodities shipped are grain, coal, petroleum, chemicals, iron, and steel. (Id.) Failure of navigation on the Illinois Waterway would accordingly have large economic consequences.

Bankline disposal is not the only method by which dredged sediment may be disposed, but it is the only economical method in many circumstances. Sites for confined disposal, whether upland or bottomland, are generally not available, and where available may be prohibitively expensive. It is estimated that construction of ten confined disposal sites would cost more than \$18 million. (Petition at 11.) Moreover, it is difficult to anticipate where dredging might be needed, and accordingly where confined disposal sites would need to be placed. As the Department of the Army observes:

The historical dredging records do not lend themselves to predicting dredging sites with sufficient accuracy to justify the expenditure of many millions of dollars for confined disposal facilities that might get little or no use. (Tr1. at 14.)

The Agency's analysis also causes it to conclude that "bankline disposal of dredged material is the only economically reasonable method of maintaining the channel" (Exh. L at ¶1).

Because today's adopted rules give authorization to bankline dispose only "clean" sediments, the Department of the Army will have to continue to make other disposal arrangements for sediments that do not pass the cleanliness tests. Historically the Department of the Army has encountered insufficiently clean sediments in the Cal-Sag Canal on the Illinois Waterway, and accordingly has prepared an upland confined-disposal facility to accommodate them. (Exh. G. at 12.) Should other low-quality sediments be encountered at places within the Illinois River system, the sediments will have to be similarly handled.

Miscellaneous Benefits. Bankline disposal has some economic and environmental benefits aside from those associated with the dredging itself. Among these is beach nourishment. The Department of the Army observes:

At certain locations some of the disposal materials are very beneficial for public recreation, as the [Illinois Waterway] system creates little or no natural beaches suitable for recreation. Also, some of the material is used to reduce shoreline erosion and to protect or improve flood control levees. There is some quantity of material placed on the bankline that has little or no beneficial use. (Exh. G at 10.)

401 Certification. The Department of the Army is required pursuant to Section 401 of the federal Clean Water Act (33 U.S.C. §1341 (1988)) to obtain periodic certification from the Agency that its dredging operations are being conducted in accordance with state water quality laws. The Department of the Army provides the Agency with annual reports of its dredging program, including all required water quality analyses. It is upon the basis of these reports that the Agency bases its certification. (Tr1. at 50-55.)

Both the Department of the Army and the Agency have requested that the requirement for 401 certification be written into the instant regulation. This action makes the certification that is required under federal law also an requirement under Illinois law, and causes bankline disposal to be prohibited in the absence of the certification.

ORDER

The Board directs the Clerk of the Board to submit the text of the following amendments to the Secretary of State for final notice pursuant to Section 6 of the Illinois Administrative Procedure Act.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE F: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 303
WATER USE DESIGNATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

SUBPART C: SPECIFIC USE DESIGNATIONS
AND SITE SPECIFIC WATER QUALITY STANDARDS

Section 303.400 Bankline Disposal along the Illinois
Waterway/River

- a) The U.S. Department of the Army, Corps of Engineers, may bankline dispose of sediment generated during maintenance dredging operations on the Illinois Waterway/River between river miles 80.2 and 291 if:
 - 1) Less than 10% of representative samples from a proposed dredge cut are composed of fine-grained material, where a material is fine-grained if more than 20% of the sample passes a #230 sieve; or
 - 2) The SSTFATE model indicates that applicable water quality standards will be met at the perimeter of a temporary area of allowed dilution having a surface area no larger than

48,000 square feet, and not exceeding either 1,000 feet in length or 150 feet in width; and

- 3) The U.S. Department of the Army, Corps of Engineers, holds a Water Quality Certification for its dredging operations from the Illinois Environmental Protection Agency pursuant to Section 401 of the federal Clean Water Act, 33 U.S.C. §1341 (1988).

- b) When the provisions of subsection (a) are met, Section 35 Ill. Adm. Code 304.105 (prohibition against causing a violation of any applicable water quality standard), shall not apply to bankline disposal by the U.S. Department of the Army, Corps of Engineers, but only as 35 Ill. Adm. Code 304.105 pertains to the offensive conditions standard of 35 Ill. Adm. Code 302.203, the dissolved oxygen standard of 35 Ill. Adm. Code 302.206, the total lead, total zinc, mercury, and total copper standards of 35 Ill. Adm. Code 302.208, and the ammonia nitrogen and un-ionized ammonia nitrogen standards of 35 Ill. Adm. Code 302.212.

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 3rd day of February, 1994 by a vote of 7-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board