The Planning of a Corps of Engineers Reservoir Project: Law, Economics and Politics

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Construction of a reservoir project often has far-reaching impact upon the surrounding natural and human environment. Such projects usually are designed to serve a number of purposes, including flood control, water supply storage, recreation, and water quality. Because of its responsibility for the planning and construction of reservoirs, the Army Corps of Engineers has been involved in some of the most important environmental controversies of the past several years. Some of these controversies might have concluded more beneficially or have been avoided entirely, had those opposing the Corps' plans become active at an earlier stage or had they known more about the Corps' decision-making process. In this article the Oakley reservoir project of the Army Corps of Engineers is studied in detail from its inception in 1939, through significant alterations in design and purposes, to its present status as a matter of legal and political controversy. The historical treatment elucidates the process by which a governmental agency's decisions evolve through interplay with other governmental en-

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ties and with private interests. The decision-making process followed by the Corps of Engineers in the planning of reservoir projects is analyzed critically. Special attention is given to the factors hindering adequate consideration of alternatives, to the problems of benefit-cost analysis, and to the grounds for judicial review of Corps planning decisions. The Corps' formulation and evaluation of the Oakley project is found to have been deficient in many respects, producing inaccurate estimates of benefits and costs and failing to satisfy the requirements of the National Environmental Policy Act.

During recent years a growing public interest in preserving the natural environment and reducing governmental expenditures has focused attention on the civil works functions of the Army Corps of Engineers. While some observers long have viewed the federal flood control program as a device to promote the power of the Corps and the re-election of influential Congressmen, new environmental awareness combined with the financial demands of the Asian war and urban problems has produced a widespread conviction that the nation no longer can afford either the monetary or the environmental costs of the program.

This article studies the planning of a single Corps project, the proposed Oakley reservoir project, on the Sangamon River in central Illinois. Estimated to cost $81 million, the project has been planned as a flood control, municipal water supply, recreation, and water quality control facility; in these and other respects, it is representative of Corps reservoirs.

Because the Oakley project threatens a natural area of scientific and recreational value, organizations, drawing upon the professional skills of economists, engineers, and natural scientists, have challenged the adequacy of Corps planning. Combining technical capabilities

with adept public relations, the opponents were able to produce striking modifications in the Corps' proposals. When subsequent changes eroded a hard-won compromise, the project's opponents initiated legal actions to block construction of the reservoir. Litigation now is pending, while the Corps continues to plan.

Using the Oakley project as an example, this paper will demonstrate: (a) the degree to which the Corps' planning to solve water resources problems is a response to local political and special-interest pressures, (b) the array of strategies and techniques employed by an effective conservation organization in opposing a Corps project and (c) planning deficiencies that can justify challenges to other faulty Corps proposals.

Part I primarily is concerned with the political dimensions of the Oakley controversy. Part II analyzes deficiencies in Corps reservoir planning generally, and describes the principal institutional and legal constraints upon such planning. Part III is an economic and legal critique of the justifications advanced for the Oakley project.

I

HISTORY OF THE OAKLEY RESERVOIR PROJECT

A. Preliminary Planning and Congressional Authorization

The Corps describes the origin of its projects as follows:  
1) Local interests desiring flood control or navigation facilities petition their Congressman.  
2) A congressional committee resolution or an Act of Congress authorizes the Corps to study the problem and submit a report.  
3) A District Engineer assigned to the study holds a public hearing, prepares preliminary plans and cost-benefit analysis, and submits his results to the Chief of Engineers. After input from middle-level analysts—the Division Engineer and a review body (the Board of Engineers for Rivers and Harbors)—the Chief of Engineers sends his findings to the Secretary of the Army.  
4) Supplemented by the views of interested state and federal agencies and the Office of Management and Budget, the compilation is sent to Congress. Included in the dossier are the Corps' recommendations on the advisability of federal funding and statements of required local cost sharing. In the case of the Oakley project, this process began in 1939 and culminated with Congressional authorization in 1962.

In the 1930's, flood problems along the Illinois River prompted local interests to seek federal relief. Congress directed the Corps to

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investigate and report on flood protection along the Illinois and its tributaries. From 1939 through 1943 the Corps conducted studies, holding 11 public hearings "for the purpose of providing opportunity to local interests to express their views and desires." Only one hearing, at Springfield in 1939, was held in the Sangamon basin. In 1945 the Upper Mississippi Valley Division Engineer submitted to the Chief of Engineers a survey report recommending a series of 15 dams on the Illinois and its principal tributaries. Three dams were proposed for the Sangamon, one to be located at the village of Oakley, just above Decatur. In the Sangamon Valley public reaction against the recommendations was strong since the reservoirs would inundate thousands of acres of rich farmland. In an unusual move the Board of Engineers for Rivers and Harbors, held an additional public hearing at Springfield in 1946 at which public officials and citizens demanded elimination from the Corps' report of all reservoirs proposed for the Sangamon basin. In 1949 the Chief of Engineers returned the survey report to the Division Engineer "for reconsideration in view of objections raised by local interests."

Between 1949 and 1961 the Chicago district office conducted further studies. No additional public hearings were held, though the Corps had "numerous conferences with local interests," including city officials and businessmen from Decatur, one of the two principal cities

10. Id. at 39.
in the Sangamon basin.\textsuperscript{11} Lake Decatur, the city's water supply reservoir on the Sangamon, was filling with silt; hence, an additional supply was desired.\textsuperscript{12}

In 1952 an advisory committee to the Decatur City Council concluded that construction of the Oakley reservoir at the upper end of Lake Decatur would intercept sediment, provide additional water, and preserve the lake.\textsuperscript{13} Because committee members were uncertain whether the Corps would proceed with the Oakley reservoir, they recommended: 1) increasing the storage capacity of Lake Decatur by erecting five-foot gates on the crest of the existing dam; 2) acquiring additional land for the eventual construction of another reservoir on Big Creek, a nearby Sangamon tributary; and 3) cooperating with the Corps so long as a possibility existed that it might complete the Oakley project. The committee concluded that the Oakley reservoir should be financed by local funds if the Corps abandoned the project, but that federal funding through Corps' participation would save the city $5 million of the $6 million required.\textsuperscript{14}

Meanwhile, Decatur and the Corps continued to negotiate. In the fall of 1959 the District Engineer advised Decatur of the estimated cost of a multiple-purpose Oakley reservoir; the city council expressed approval of the project and its willingness to pay $4 million, the tentative allocated cost for 11,000 acre-feet of water supply storage.\textsuperscript{15}

In April 1961 the District and Division Engineers in a new report recommended construction of only one dam in the Illinois River basin—a multiple-purpose dam and reservoir on the Sangamon River at the upper end of Lake Decatur to serve flood control, water supply, and

\textsuperscript{11} Decatur is an industrial city of 90,000 people. Springfield, the state capital, is the other major city.

\textsuperscript{12} Due to siltation caused by erosion of upstream agricultural lands, the capacity of Lake Decatur has decreased at an annual rate of one percent, or 200 acre-feet, over the last 50 years. See UNIVERSITY OF ILLINOIS COLLEGE OF AGRICULTURE, THE STORY OF A LAKE (Extension Service Circular 644, 1949).

\textsuperscript{13} City of Decatur, Ill., Report of the Advisory Comm. for Preservation of Lake Decatur and for Additional Water Supplies, June 14, 1952, at 8.

\textsuperscript{14} Id. at 2, 8. The Report stated that dredging the lake would be more costly and that no convenient site was available for disposing of dredging spoil, since the lake is bordered by homes and businesses. In 1955 Decatur erected five-foot gates on top of Lake Decatur dam, providing an additional 16,000 acre-feet of storage at a cost of $3 million. Another $100,000 was spent to drill and equip two deep standby wells with total pumping capacity of five million gallons per day. H.R. Doc. No. 472, at 164-65. The wells tapped the large Mahomet Valley aquifer along the Sangamon 12 miles north of the city, so that in periods of low streamflow, water could be pumped directly into the river just upstream from Lake Decatur. In a 1959 referendum, voters rejected by a 2 to 1 margin the city council's proposed $3 million bond issue to finance purchase of land for a Big Creek reservoir. Decatur Herald, Jan. 28, 1959, at 1.

recreation needs.\textsuperscript{16} The report also proposed channelization of 98 miles of the river below the lake to permit faster release of flood waters. Total construction costs were estimated at $29.6 million, of which Decatur was to pay $4.6 million. The other reservoirs recommended in the 1945 survey report were rejected in the 1961 report because they either lacked economic justification or were opposed locally.\textsuperscript{17} In their place flood protection would be entrusted to levees.\textsuperscript{18}

After the Board of Engineers for Rivers and Harbors and the Chief of Engineers concurred in the recommendations, the Secretary of the Army forwarded the survey report to Congress in 1962. There the proposal received strong support from Illinois Senators Paul Douglas and Everett Dirksen and from Congressman William Springer, in whose district the project was to be located.\textsuperscript{19} In committee testimony, these men agreed that the Oakley project urgently was needed for reasons summed up in the following statement of Senator Douglas:

> The benefit-to-cost ratio is listed as 1.2 to 1. Now this figure may appear low in comparison with other projects but it does not reflect the important rise in employment, which I am most confident will occur from the availability of water for industrial supply.

> At present, Lake Decatur is taxed to capacity. Sedimentation is filling the lake up, and a new source of water supply is needed in the area before any large industrial expansion can take place.\textsuperscript{20}

That fall Congress, in the Flood Control Act of 1962, authorized construction of the Oakley reservoir and channel improvements in "substantially the form recommended" by the Corps.\textsuperscript{21} Apparently, the Chicago District might have the opportunity to build its first reservoir project.

\textbf{B. The Corps' 1966 Plan for a Larger Project}

\textbf{1. The Proposed Changes}

After Congress authorizes construction of a reservoir, the Corps

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\textsuperscript{16} H.R. Doc. No. 472, at 5-12, 14 \textit{et seq.}
\textsuperscript{17} \textit{Id.} at 47-48.
\textsuperscript{18} Only 800 of the 5,500 square miles of the Sangamon basin and the 29,000 square miles of the Illinois River basin are drained by the portion of the Sangamon above the Oakley dam site.
\textsuperscript{19} \textit{Hearings on H.R. 12900 Before the Subcomm. on Pub. Works of the Senate Comm. on Appropriations, 87th Cong., 2d Sess., at 2102, 2117, 2489 (1962).}
\end{flushleft}
seeks appropriations for advanced engineering and design. If funds are made available for such planning, some project modifications or, "refinements" commonly occur at this stage.\textsuperscript{22} Between 1962 and 1966 Congress appropriated $1 million for advanced planning of the Oakley Project.\textsuperscript{23} The resultant changes, announced by the Corps early in 1966 without prior public hearings, were much more than mere refinements.\textsuperscript{24} An entirely new purpose was added—water quality control. More than 50,000 acre-feet of water were to be stored during periods of high stream flow and released during dry periods to dilute effluent discharged into the Sangamon from the Decatur sewage treatment plant four miles below Lake Decatur.\textsuperscript{25} The reservoir storage allocated for sedimentation and flood water retention also was increased, as was the amount of land around the reservoir to be acquired for public access and recreation. The changes in storage capacity would require increases in the proposed heights of the "joint-use" or "conservation" pool (from 621 to 636 feet above mean sea level) and of the flood control pool (from 645 to 654 feet).\textsuperscript{26} In the Illinois flatlands, since each additional foot in elevation requires an additional mile in reservoir length, Lake Oakley (as the joint-use pool was to be called) now would be 25 miles long, rather than 10 as originally proposed, and the project would require four times the land area and

\begin{table}
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\hline
Storage Use (acre feet) & 1962 & 1966 \\
\hline
Sediment accumulation & 4,500 & 12,000 \\
Water supply & 11,000 & 11,000 \\
Low-flow augmentation & 0 & 50,800 \\
Flood control & 132,500 & 168,700 \\
\hline
Total & 148,000 & 242,500 \\
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\end{tabular}
\caption{Storage allocations in the original and revised projects.}
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Storage for sedimentation was increased since the project's planned economic life was extended from 50 to 100 years, as allowed by S. Doc. No. 97, \textit{supra} note 20, and since the Corps changed its estimate of the average future sediment deposition rate from 90 to 120 acre-feet per year. Storage for flood control was increased due to revision of estimated peak flows for historic record floods on the Sangamon at Monticello, 30 miles upstream from Lake Decatur. The acreage to be acquired for public access and recreation was increased due to a new land-acquisition policy for reservoir projects adopted in February 1962, after completion of the Corps' report to Congress. Corps of Engineers, Chicago Dist., Fact Sheet, Oakley Dam and Reservoir, Sangamon River, Ill., Nov. 15, 1968, at 2.

\textsuperscript{22} Corps of Engineers Chicago Dist., Fact Sheet, Oakley Dam and Reservoir, Sangamon River, Ill., Nov. 15, 1968, at 2.


\textsuperscript{24} Basic specifications of both the 1962 and 1966 plans are contained in Corps of Engineers, Chicago Dist. \textit{Summary of Oakley Reservoir and Channel Improvement Project}, Sangamon River, Ill., Jan. 1968.

\textsuperscript{25} Presently, no water is released from Lake Decatur during periods of low flow. Thus the entire streamflow immediately below the plant consists of effluent.

\textsuperscript{26} Allocations of storage in the original and revised projects were as follows:
twice the cost previously estimated. Of the 3,800 additional acres now to be inundated permanently by the expanded joint-use pool, most were farmlands. However, 640 acres comprised the bottomland forest in Robert Allerton Park, a forest reserve and public park dedicated to research and education.

2. The Threat to Allerton Park

Samuel Allerton was a founder of the Chicago stockyards and the First National Bank of Chicago. When he died early in this century, his estate included several thousand acres of forest and farmland along the Sangamon River in Piatt County. His son, Robert Allerton, developed the woodland property into a gentleman’s estate in the pattern of the great estates of Europe. In the upland forest north of the river he built a Georgian mansion, surrounded by exquisite lawns, formal gardens, and imported statuary. Nearly all the bottomland forest on both sides of the river and the larger upland forest to the south was left in its natural state, except for creation of a few trails. The result was a striking marriage of art and nature.

In 1946 Robert Allerton gave the woodland estate—1,200 acres of forest and 300 acres of lawns and gardens, including the mansion—to the Board of Trustees of the University of Illinois in trust, “for educational and research purposes, as a forest, wild and plant-life reserve, as an example of landscape gardening, and as a public park.” Simultaneously, he gave the University 4,000 acres of nearby farmland with the stipulation that its income be used to maintain and develop the woodland property, which was named Robert Allerton Park.

Almost all former woodlands in central Illinois have been cleared to obtain maximum production of corn, soybeans and other crops from the exceptionally fertile soil, so that Allerton Park is a unique natural area for both the scholar and the recreationist. Its forests constitute more than one-third of all natural woodlands accessible to the public within 65 miles of the proposed reservoir, and 250,000 people visit the park each year.

27. The joint-use pool would cover 6,200 acres, rather than 2,400. The total land to be acquired would be 24,350 acres, rather than 6,700. The project now was estimated to cost $60 million, double the $29.6 million reported to Congress in 1962. The benefit-cost ratio was projected to be 1.3.


In 1931 the Illinois Natural History Survey, located twenty miles away on the University of Illinois' Champaign-Urbana campus, began conducting biological research at the Allerton estate. Research has continued at an accelerated rate, with the area being used intensively since 1946 by the University as an outdoor laboratory for teaching and research. Classes regularly use it for field trips and observations, and numerous graduate theses have been based on studies of the park's fauna and flora. The portions of the Allerton forests utilized for these purposes have been classified by scientists as a natural area, free of all deliberate alteration by man, which approaches closer to the original primitive conditions than any other area of similar type and size in central Illinois. Its preservation as a natural area is of very great value to science, and this value will continue to grow as the rest of the region becomes increasingly modified by agriculture, industry, and urbanization.

Allerton bottomlands range in elevation from 627 feet at the downstream end to 632 feet at the upstream limits. An Oakley joint-use pool at elevation 636 feet would inundate permanently 640 acres of the park. In addition, waters temporarily withheld in a 654-foot flood control pool periodically would inundate 220 additional acres for up to 80 days. The relationship of Oakley reservoir to Allerton


32. COMMITTEE ON ALLERTON PARK, BATTLE FOR THE SANGAMON, 1971, at 8-9 (printed collection of commentaries by Univ. of Illinois scientists, engineers and social scientists on various aspects of the planning of the Oakley project and the value of Allerton Park).


In a paper presented at the 137th meeting of the American Association for the Advancement of Science in Chicago on Dec. 30, 1970, William C. Ackerman, Chief of the Illinois State Water Survey, said, "The Allerton bottoms are not natural, virgin land or a living fossil of the past... Since about 1920 [the upstream watershed] has been drained [and is intensively cultivated]. The effect on runoff has been dramatic. Floods are much greater, and the bottoms are covered with flood water every year—often for long periods." However, since 1970 Dr. S.C. Kendeigh, Chairman of the Committee on Natural Areas, has studied the flooding pattern at Monticello, just above Allerton Park on the Sangamon, during the period from 1908 to 1965, in which time the portion of the upper Sangamon basin included within drainage districts increased from eight to 50 percent. Yet, comparing individual floods in 1908 with those in later years when the rainfall was nearly identical, Kendeigh found that the present flooding pattern—averaging 3.3 floods lasting five days each per year—is no different from that which prevailed between 1908 and 1920. Although the study has not yet been published, the results are cited in a letter from Willard D. Klimstra, Chairman of the Illinois Nature Preserves Commission, to Daniel Walker, Governor of Illinois, Feb. 28, 1973, reaffirming the Commission's opposition to the Oakley Modified Project. Concerning the Commission and its role in the Oakley controversy, see text following note 43 and accompanying notes 128 and 143 infra.

34. Harza Engineering Co. Alternatives For the Oakley Reservoir Project, May 1968, at II-9 (report of study conducted for the Board of Trustees, Univ. of Illinois).
Park is indicated by the following diagram, which depicts the Modified Project adopted by the Corps in 1970 and the further changes sought by conservationists:

3. **Opposition Arises**
   
a. **The University of Illinois**

   Announcement of the plan to expand Oakley generated a quick reaction from the University of Illinois questioning the need for enlargement and suggesting that the Corps consider alternative means of achieving the project purposes. The University trustees suggested "treating pollution at its source rather than by dilution by low-flow augmentation" and a "system of tributary impoundments" for flood control, recreation, and sedimentation control.\(^{35}\)

   Evidently, the Corps knew little about Allerton Park and was caught off guard by the University’s reaction.\(^{36}\) Despite the Univer-

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\(^{35}\) Letter from H.O. Farber, Vice-President and Comptroller, Univ. of Illinois, to Col. John Mattina, the Corps' Chicago Dist. Engineer, Mar. 17, 1966. Announcement of the plan to enlarge the reservoir also brought complaints from farmers in Piatt County whose lands would be taken and from city officials of Monticello, the county seat, through which a 636-foot joint-use pool would extend.

\(^{36}\) In 1969, a Corps official confirmed that the conflict between the larger project and the values of the park had come as a surprise:

   Allerton Park kind of slipped up on everybody . . . [I]n this new design period . . . the height of the dam was raised to accomplish [several] factors. In the meantime, of course, this ran the water level back up through Allerton Park. And I think before anybody realized it we were in this mess of planning to destroy a facility that nobody did want to destroy.
Planning of a Reservoir Project

University's apparent advantage, resistance by the Board of Trustees soon waned. Governor Otto Kerner and legislators from Decatur and downstream areas were anxious that the project be built, and the Governor and legislature controlled the University budget. Contrary to recommendation of the faculty Committee on Natural Areas, the trustees in October 1966 adopted a resolution which, after reciting the damage which the revised Oakley project would do to Allerton Park and to scientific education and research at the University, concluded meekly that Allerton Park could not obstruct the "wider public interests involved."

Despite official acquiescence, several scientists and engineers within the University were convinced that feasible alternative solutions existed. In letters to government officials they urged that water quality control be achieved through advanced waste treatment at Decatur rather than through streamflow augmentation; they also urged that Decatur obtain its additional water supply from the Mahomet Valley aquifer, which supplies Champaign-Urbana. They questioned the recreational value of a reservoir which would be drawn down five or more feet during summer and fall, exposing vast mudflats; and they demanded local public hearings, none having been held since 1946.

The fall of 1967 brought two announcements which could have been expected to encourage University cooperation in the project. In late September the Corps revealed an offer to the University of three sites on the expanded Oakley reservoir, totaling 940 acres, where an outdoor education-recreation center could be located and related teaching, research and public-service activities conducted.


37. At a meeting in Springfield on Oct. 15, 1968, John Guillou, head of the Div. of Waterways, Ill. Dep't of Pub. Works and Bldgs., told the Director of the Department that although former Governor Kerner had been advised that the Oakley reservoir was poorly conceived and would inundate too much high-quality farmland, Kerner had yielded to the view of his Director of Business and Economic Development that Illinois needed the federal money which construction of the project would bring into the state.

38. A letter from S.C. Kendeigh, Chairman, to University President David D. Henry, Sept. 19, 1966, reported the committee's recommendation that the expanded Oakley project be opposed not only because it would destroy Allerton Park's educational and research value but also because acquiescence would violate the University's trust obligations to Robert Allerton and the people of Illinois, discouraging other similar donations.


In early October Congressman Springer announced congressional approval for the Corps to locate its important new Construction Engineering Research Laboratory in Champaign, in facilities to be constructed by the University of Illinois Foundation and leased to the Corps at an annual rental of nearly $1 million. The University and Champaign-Urbana had been competing with other communities throughout the nation for this laboratory, and the Congressman proudly proclaimed that it would attract more private industry to the area. The similarity between the laboratory's anticipated contribution to Champaign-Urbana and the Oakley project's expected effects in Decatur was striking.

On the day of the Congressman's announcement, representatives of the University met with the Corps' Chicago District Engineer to assess the future of Allerton Park. Items discussed included: (a) whether the Corps would forego timber clearance and acquisition of fee title above elevation 636 feet; (b) whether the University would be allowed to restrict access to areas where uncontrolled public usage would interfere with educational and research programs; and (c) whether, to assure continuity of research subsequently undertaken, the Corps would agree to limit both subsequent acquisition of park lands and further increases in the level of the joint-use and flood control pools. The Corps agreed to consider all but the last request, which it flatly rejected.

b. The Committee on Allerton Park

Oakley opponents now realized that new tactics were required to force a change in the Corps' plans. Letters from faculty members and conservationists were having little effect on the Corps or the University. In late October 1967 three faculty members denned themselves the Committee on Allerton Park, obtained local publicity, and with the help of quickly responding volunteers began circulating a petition statewide protesting the flooding of Allerton Park and asking the Corps to return to a joint-use pool elevation of 621 feet. The campaign's theme was that the Oakley project was a destructive boondoggle to obtain for Decatur a cheap water supply and a free substitute for adequate waste treatment and that, to justify it, the Corps had exaggerated benefits, underestimated costs, and ignored alternatives.

41. Champaign-Urbana News-Gazette, Oct. 4, 1967. The $7 million complex was to include four laboratory buildings plus administration, warehouse, shop and utility buildings; it was to employ 250 persons with an annual budget of $3.5 million.
42. Minutes of Sept. 20, 1967 meeting of the Comm. on Bldgs. and Grounds, Bd. of Trustees of the Univ. of Illinois; minutes of Oct. 4, 1967 meeting of the Comm. on Bldgs. and Grounds with Corps officials, signed by Walter M. Keith.
On December 4, 1967, representatives of the Committee traveled to Washington to present their petition to Congressman Springer, Senator Dirksen, and newly elected Republican Senator Charles Percy. The petition bore the signatures of 20,000 Illinois voters, half of whom were from the Champaign-Urbana area. Later that day Senators Dirksen and Percy and Congressman Springer issued a joint statement requesting that in designing the project, the Chief of Engineers "take into consideration any alternative workable proposals for construction of Oakley without adverse effects on Allerton Park."\(^4\)

c. **The Illinois Nature Preserves Commission**

In November 1967, shortly before the Allerton Committee's petition was carried to Washington, the Illinois Nature Preserves Commission\(^4\) submitted to the Governor, the Corps, all Illinois Congressmen and legislators, and other federal and state officials a "Request for Re-Study of the Oakley Dam Project and Its Relation to Robert Allerton Park." This document emphasized the park's value and recommended further consideration of alternative means of achieving the project purposes without raising the level of the joint-use pool above 621 feet. Advanced waste treatment at Decatur was suggested as an alternative, as were use of the Mahomet Valley aquifer for water supply and control of floods and sedimentation through small tributary dams combined with contour plowing and terracing. The commission's request was the first public criticism of the Oakley project by a state agency, except for initial questions raised by the University Trustees prior to their October 1966 resolution endorsing the project.\(^45\)

4. **The University Contracts for a Study of Alternatives**

On February 21, 1968, the University Board of Trustees, pursuant to a resolution of the Building and Grounds Committee,\(^46\) con-

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\(^44\) The commission is composed of nine lay and scientific members appointed by the Governor and charged with the supervision and management of protected preserves. *See Ill. Rev. Stat. ch. 105, §§ 465a-68, 501-08 (1971)* concerning the Illinois nature preserves system and the powers and duties of the commission. Members of the commission are chosen from "persons with an interest in the preservation of natural lands" and serve without compensation.

\(^45\) The commission member who brought the Allerton-Oakley matter to the commission's attention was Dr. S.C. Kendeigh. He had been conducting research in Allerton Park continuously for 20 years and was chairman of the University's faculty Committee on Natural Areas which in September 1966 unsuccessfully had urged the Board of Trustees to oppose the Corps' plan for a larger reservoir. He also was a key scientific adviser to the Committee on Allerton Park.

\(^46\) Due to widespread public concern for protection of Allerton Park, some "disappointing" discussions with the Corps, and the December 4 statement by Senators
tracted with Harza Engineering Company of Chicago, internationally known consultants on river projects, for a study to be completed within eight weeks to accomplish these objectives: (a) to identify and appraise very generally a broad range of alternatives to the higher Oakley project; (b) to determine whether any alternatives were sufficiently promising to merit further in-depth engineering and economic investigation; and (c) to design a program of investigation and analysis for detailed investigation of the promising alternatives. The trustee from Decatur dissented.47

Supporters of the Oakley project now were on notice that important new elements had been added to the political and planning processes. The University of Illinois is a powerful force in the state, and Harza's engineering competence is well established.

5. Oakley Supporters Respond

Recognizing that a real threat to the project might be developing, Congressman Springer in news releases and letters to constituents sought to portray Oakley as more than a water project for Decatur, indicating that the major purposes to be served were flood control and recreation.48

The Corps and the Decatur Chamber of Commerce also replied to attacks on the project with news releases, brochures and paid adver-
They pointed out that stream-flow augmentation was not intended to substitute for adequate waste treatment because Decatur's existing secondary treatment facility already was "the best practical treatment or removal system available"; that a water supply reservoir for the Sangamon Valley was "inevitable"; that the enlarged Oakley project would not "destroy" Allerton Park, since the mansion, gardens and statuary would not be touched, only the floodplain forest being bulldozed and inundated; that the recreational benefits of the lake and associated park lands would far exceed any losses in Allerton Park; and that the project was not a product of inadequate planning because the Corps and other federal and state agencies had been studying it for over 25 years.

In January 1968 Secretary of the Interior Stewart Udall, in whose Department the Federal Water Pollution Control Administration then was located, replied to requests from the Illinois Nature Preserves Commission that advanced waste treatment and underground water be considered as alternatives to reservoir storage for water quality and water supply. In a widely distributed letter, he stated that advanced waste treatment was being developed but was "estimated to cost at least twice as much as the proposed flow regulation" and that use by Decatur of water from the Mahomet Valley aquifer would "hasten the time when Champaign-Urbana would need to seek alternative water supply sources and would increase the cost of production for all."

In February 1968 Senators Dirksen and Percy and Congressman Springer issued another joint release, stating that because the Corps had not yet completed consideration of all alternative proposals that might avoid adverse effects on Allerton Park, and because the $2 million budget request for the project for fiscal year 1969 was restricted to planning and land acquisition, the Chief of Engineers had been requested to restudy the project and report back his findings not later than the spring of 1969.


52. Id. at 2-3.

53. Id. at 5.

54. Id. at 6; Corps Press Release, supra note 49, at 1-2; Decatur Junior Chamber of Commerce booklet, supra note 49, at 14-15.


56. Statement issued by office of Sen. Dirksen, Feb. 2, 1968, following a meet-
6. **Harza Engineering Company's Report on Alternatives**

In May 1968 Harza Engineering Company submitted its report on alternatives for the Oakley project to the University of Illinois. Harza had studied alternatives which would permit the Oakley joint-use pool to be lowered to 621 feet, meeting "previously established requirements" for water supply and water quality control by means other than use of storage at Oakley reservoir.

Since most of the reservoir's capacity up to elevation 621 feet eventually would be needed for the sediment expected to accumulate over the project's 100-year economic life, Harza focused on alternatives for the 61,000 acre-feet of usable conservation storage proposed by the Corps above elevation 621 feet. Harza assumed that Oakley reservoir would serve the purposes of recreation, sediment storage, and flood control, and that water supply and water quality control were to be provided by other means. The Oakley project did "not necessarily" appear to be rendered uneconomical by elimination of all or part of the water supply and low-flow augmentation storage.

Harza determined that the most attractive alternatives, which might be undertaken singly or in combination, were: (a) Interim use of storage allocated for sediment accumulation until such time as sediment occupied the space, in lieu of 6,000 to 12,000 acre-feet of Oakley joint-use storage. (b) Use of groundwater from the Mahomet Valley aquifer, in lieu of up to 61,000 acre-feet of Oakley joint-use storage. (c) Use of an offstream upland reservoir, formed by a ring dike on flat land adjacent to the Oakley reservoir and supplied by water pumped from Oakley, in lieu of 6,000 to 15,000 acre-feet of joint-use storage. (d) Construction of a dam at the mouth of Friends Creek to seal off...
the conservation pool of a separate tributary reservoir from Allerton Park, in lieu of 25,000 to 61,000 acre-feet of Oakley joint-use storage. (e) Advanced waste treatment at Decatur to eliminate or reduce the amount of water needed for low-flow augmentation, in lieu of up to 50,800 acre-feet of Oakley joint-use storage. 

In Harza’s view, the most promising approach was a staged development program, involving one or more of the foregoing alternatives, which would defer capital expenditures until facilities were required, and would allow adjustments in the program as needs changed. Cost advantages of staging would be significant. Harza estimated that the present value of all capital and annual (operating, maintenance and replacement) costs for each of six ways of providing water supply and water quality control by means other than storage in Oakley reservoir would range from $1.2 million to $11.4 million. Each was less than the $15.7 million present value of costs allocated to the same functions under the expanded Corps project.

Harza recommended that further studies of the suggested alternatives be conducted, or at least coordinated, by the Corps. If that agency would not initiate further studies of alternatives, Harza suggested that the Division of Waterways of the Illinois Department of Public Works and Buildings assume responsibility for analysis.

The University directed its administrative officers to discuss the report with the Corps. In June 1968 the Corps’ Chicago District office indicated that it would consider alternatives (a) and (d) above but did not feel authorized to explore Harza’s other suggestions.

7. Oakley Opponents Expand Their Political Activities

a. Appeals to Congress

In May 1968 representatives of the Committee on Allerton Park and Piatt County agricultural and business interests testified in opposition to the Corps’ safety plan at the congressional Appropriations
Committee hearings. They introduced into the record supporting statements by persons ranging from artists to sanitary engineers, as well as endorsements of their position by numerous local civic and governmental organizations. The Washington representative of the Sierra Club asked that funds be withheld pending a thorough study of all possible means of achieving the project purposes. Senators Dirksen and Percy and Congressman Springer expressed hope that the Corps would return with a satisfactory solution in another year, and the Corps agreed to the Senate committee suggestion that land acquisition be limited to the dam site, far downstream from Allerton Park. Although Congress eventually did appropriate nearly the $2 million the Corps had requested for Oakley planning and land acquisition in fiscal year 1969, later events indicated that the opponents had made a strong impression in Washington.

b. Efforts at the State Level

In Springfield the Committee on Allerton Park began talking with Mr. John Guillou, the energetic and ambitious head of the Illinois Division of Waterways. A former professor of civil engineering, Guillou was not happy with the politics or the tangible products of a system by which large reservoirs were planned by the Corps and local chambers of commerce without active involvement of the state and his department because the Governor welcomed federal investment and saw no need to complicate matters. This had been the situation under Democratic Governor Otto Kerner from 1961 until he resigned in the spring

70. *Hearings on Pub. Works Appropriations for 1969 Before the Subcomm. on Pub. Works of the House Comm. on Appropriations, 90th Cong., 2d Sess., pt. 4, at 507-41 (1968).* The group included an engineer, an ecologist, and an economist from the University, a city councilwoman and a housewife from Urbana, the Piatt County agricultural agent, and a realtor from Monticello, the Piatt County seat.

71. *Id. at 1048-49.*


73. Senator William Proxmire of Wisconsin tried unsuccessfully to amend the public works bill to delete the Oakley project, which he called a "pork barrel, boondoggle of the most blatant kind." 114 *Cong. Rec.* 22460 (1968). The project's congressional proponents, Senator Dirksen and Congressman Springer both were re-elected in November 1968. Although his opponent was a weak candidate, Springer viewed his victory as a vindication of his support for Oakley. Remarks of Congr. Springer at the home of a reporter for the Champaign-Urbana Courier, Feb. 1, 1969. Senator Percy was viewed as more flexible. In 1968 he successfully urged the Corps to study all possibilities suggested by Harza; however, the Senator never firmly opposed the Oakley project. In an interview in Springfield on Feb. 1, 1969, he said that water supply and recreation potential were needed to make Decatur attractive to able young people who might otherwise go elsewhere.
of 1968. Then in June 1968 his Democratic successor, Samuel Shapiro, just having been elevated from Lieutenant Governor and facing an election in five months, wrote to the Corps, endorsing the Oakley project and recommending that the Corps of Engineers promptly proceed with site acquisition.

In October 1968 representatives of the Committee on Allerton Park met with Mr. Guillou and his superior, the Director of Public Works and Buildings. The Allerton Committee and Guillou had prearranged this meeting to attempt to persuade the Director to authorize, or to ask Governor Shapiro to authorize, the Division of Waterways to study thoroughly the Corps' proposal and the water resources needs of the Sangamon basin. Guillou told the Director that mainstream reservoirs were not appropriate in the flat, intensively cultivated land of central Illinois and that the Oakley project would produce more damages than benefits. Since Governor Shapiro already had indicated his support for an Oakley project and was facing an imminent election in which he needed Decatur's Democratic vote, Guillou acknowledged the difficulty of stopping the project, but suggested that the Division of Waterways could formulate a better plan than the Corps' proposal. The Director indicated he would discuss the matter with the Governor; but no study was authorized prior to the November gubernatorial election, in which Republican Richard Ogilvie defeated Governor Shapiro.

In December 1968, a month before Mr. Ogilvie was to take office, the University of Illinois Trustees urged Governor Shapiro to authorize the Division of Waterways to conduct an independent study of

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74. See note 37 supra. Kerner resigned as Governor to accept a seat on the U.S. Court of Appeals for the Seventh Circuit.


76. See note 37 supra.

77. Guillou stated that the new Illinois water quality standards requiring advanced waste treatment obviated any need for low-flow augmentation to control water quality. He contended that retention of flood waters at Oakley would be a mistake because: (a) downstream flood damage was not serious; (b) to build a reservoir of the contemplated capacity on such flat terrain would require withdrawal of much high-quality farmland from production; and (c) downstream crop losses might increase, since gradual releases of flood waters causing the lower Sangamon to flow full to its banks for weeks after heavy spring rains would hinder bottomland drainage during the crucial planting and early growing seasons. Guillou cited the case of the recently completed Carlyle reservoir on the Kaskaskia River. Increased downstream crop losses had forced the Corps to reduce its flood release rate to only 4/7 of that planned. Even after this reduction, downstream flood losses continued to exceed those experienced before construction of the reservoir, and the Federal Crop Insurance Corporation was forced to withdraw its offer of insurance for wheat in 1971 and either withdraw its offer or increase rates substantially for corn and soybeans. Letter from Michael J. O'Connell, Federal Crop Insurance Corp., Springfield, Ill., to Bruce Hannon, June 11, 1970. See also Centralia (Ill.) Sentinel, June 28, 1970, at 8A, and July 9, 1970, at 8.
the Oakley project and seek "a compromise solution which lowers the [joint-use pool] back to elevation 621 [feet] or lower." The Trustees' letter to Governor Shapiro candidly appraised the Corps' attitude, indicating that the Corps would ignore the Harza study and that unless the Division of Waterways produced a report soon, the state would lose out in a public confrontation with the Corps. The Trustees, however, had no more success than the Allerton Committee in persuading the Shapiro administration to undertake a study.

As soon as the Ogilvie administration was installed in January 1969, Springfield began to respond. In a series of meetings, Guillou worked with project opponents and proponents to reach a compromise. On February 18 a state senator acting for the administration introduced a bill appropriating $25,000 for the Department of Public Works and Buildings to study the effects of the proposed reservoir, including alternative means of meeting community needs.

c. Action in Washington

In August 1968 the Corps announced that within the next year

78. Letter from Ralph C. Hahn, Chairman, Comm. on Bldgs. and Grounds, Bd. of Trustees of the Univ. of Illinois, to Gov. Samuel Shapiro, Dec. 12, 1968. The letter read in part:

The Corps is now restudying the project. . . . [O]ur concern is that they are paying only lip service to the Harza study and to all the objections to their design, and that they are proceeding with their original plans regardless of the desires of the University or of the State of Illinois.

If they accomplish this before Waterways has a chance to make its proposed study, the State would be in the impossible position of asking the Corps to delay the project . . . and then of endangering the project in its entirety if an objection was raised later as a result of the State study . . .

Quite frankly, it appears that the only way the State can possibly hope to have any voice in this or to protect its own interests is to make its study immediately and then negotiate with the Corps behind the scenes before their recommendations are made public.

79. An unpublicized meeting of state and army officials was held February 14 at Allerton Park. The federal officials reportedly were told that although the Ogilvie administration had not yet formulated a firm policy on the Oakley project, it was unlikely that the state would support it or that Congress would fund its construction unless the Corps developed a plan to which all factions in the controversy could agree. Interview with John Guillou at St. Joseph, Ill., Feb. 14, 1969. Three days later, after a meeting attended by Guillou and representatives of various departments of state government, a joint statement was issued, indicating that: (a) the group had discussed what administrative role, if any, the state should assume in the federal project, (b) no conclusions were reached, and (c) they were asking Senators Dirksen and Percy, Congressman Springer, and the Corps to share with the state all available information and alternative plans concerning the Oakley dam. Champaign-Urbana News-Gazette, Feb. 17, 1969. While supporting the project, the state officials noted that without compromises to achieve unified regional support Congress likely would prefer to fund less controversial projects elsewhere. This was to be the theme by which Guillou and the Ogilvie administration would seek to unify all factors in the controversy.

and a half it would purchase all land at the Oakley dam site.\textsuperscript{81} In December 1968, after announcing it had begun Oakley land acquisition activities by obtaining an option on a 52-acre tract at the dam site,\textsuperscript{82} the Corps' Chicago District office disclosed that a freeze of funds related to the change of administrations in Washington would prevent purchases of land for the project until the beginning of fiscal year 1970, except in hardship cases in which the owner could not wait for payment.\textsuperscript{83}

At the end of January 1969, representatives of the Committee on Allerton Park visited Washington and presented their arguments against the expanded Oakley project to officials of all agencies connected with the project, concentrating particularly on the Bureau of the Budget and the Department of the Interior. At precisely the same time, in an apparent effort to combat pressure for return to a smaller project, the Chief of Engineers' office stated publicly that the plan originally recommended by the Corps and authorized by Congress in 1962 no longer was economically feasible.\textsuperscript{84}

In February 1969, despite this announcement and without final approval of any Oakley project, the Corps purchased for $80,000 the tract of land on which it had obtained an option.\textsuperscript{85} Thereafter, the Budget Bureau impounded all funds for land acquisition and preparation of working drawings for the Oakley project. Though the duration of the impoundment was not defined at the outset, it was to last until December 1970.

8. The Corps' Study of Alternatives

In March 1969 the Corps finally completed and released its long-awaited study of alternatives.\textsuperscript{86} The report concluded that if all purposes of the 1966 plan were to be achieved through a single reservoir on the Sangamon, the level of the joint-use pool would have to be

\begin{footnotes}
\item[81] Champaign-Urbana Courier, Dec. 28, 1968.
\item[83] Champaign-Urbana Courier, Dec. 28, 1968.
\item[84] Because the reservoir provided insufficient storage for sediment and flood control, because more adjacent land had to be acquired for public access, and because of inflation, the benefit-cost ratio of that plan had dropped to 0.9. Champaign-Urbana News-Gazette, Jan. 29, 1969; letter from Col. Ferd E. Anderson, Jr., Ass't Director of Civil Works for Central Divs., to Bruce Hannon, Mar. 13, 1969. See note 26 supra.
\item[85] This transaction first was revealed to the public in the Champaign-Urbana Courier, Jan. 6, 1971, at 3.
\item[86] Corps of Engineers, Chicago Dist., Study of Alternatives, Oakley Reservoir and Channel Improvement, Sangamon River, Ill., Mar. 15, 1969 [hereinafter cited as Study of Alternatives].
\end{footnotes}
raised even more, from 636 to 640 feet. Thus, 670, rather than 640, acres of Allerton Park would be permanently inundated. However, the report also concluded that while a 640-foot reservoir was the plan most feasible economically, more costly alternatives could serve the same purposes while preserving Allerton Park. Fourteen specific alternatives were presented.

The report did not state which of the many possible plans the Corps favored, and the District Engineer expressly deferred his recommendations pending review of the report by the State of Illinois and others. After receiving reactions from the state and the University of Illinois, the Corps was to hold public hearings in three cities before deciding which plan to adopt and present to the Congressional appropriations committees in June. A few weeks later, the Corps declared it would hold the hearings on May 14, 15 and 16. Coincidentally, the final hearing would be on the eve of U.S. Supreme Court Justice William O. Douglas' hike through Allerton Park to dramatize the controversy.

On May 6 the Committee on Allerton Park presented to state officials in Springfield a petition signed by 78,000 voters, demanding the park be protected against all man-caused permanent and periodic flooding, i.e., that both the joint-use and the flood control pools be kept below the 627-foot elevation of the downstream end of Allerton.

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87. *Id.* at 5-6. More storage was required for streamflow augmentation because Regulation SWB 14 of the Illinois Sanitary Water Board, adopted March 5, 1968, required maintenance of 5 mg/l of dissolved oxygen in the Sangamon during at least 16 hours of any 24-hour period, whereas the Corps' plan was based on the Public Health Service's 1965 recommendation of a 4 mg/l concentration of dissolved oxygen.

88. *Id.* at 8.

89. *Id.* at 14, 158. The 14 alternatives, many of them variants of Harza's proposals, incorporated the following features in various combinations:

(a) Subimpoundments on the Sangamon at the upper end of Oakley reservoir to provide a stable joint-use pool in Allerton Park and at Monticello.

(b) Dikes along both sides of the Sangamon in Allerton Park to prevent permanent inundation and to permit controlled flooding.

(c) Purchase and exchange of other bottomlands along the Sangamon for the Allerton bottomlands.

(d) Tributary, upstream, or upland reservoirs.

(e) Use of groundwater.

(f) Interim use of sediment storage in Oakley reservoir to meet water requirements.

(g) Watershed treatment in the form of soil and water conservation practices to reduce erosion and sedimentation above the Oakley dam site.

(h) Partial or advanced waste treatment at Decatur to reduce or eliminate storage for low flow augmentation. The benefit-cost ratio for the 640-foot reservoir was estimated at 1.34, while ratios for the other plans varied from 1.32 down to 0.95.

90. *Id.* at 58.


The Corps' timetable went awry when both the state and the University failed to respond by May 14. The Corps proceeded with the hearings but declined to identify the alternatives it favored. Citizens appeared in large numbers and attacked all variations of the project at hearings held in Springfield and Monticello. Objections were voiced even in Decatur.\textsuperscript{93}

On May 17, 1969, hundreds of people heard Justice Douglas remark that a good case could be made for calling the Corps "Public Enemy Number One," and struggled to match his loping pace through the Allerton bottomlands.\textsuperscript{94} Four days later the University of Illinois Trustees responded. They unanimously adopted a resolution opposing any Oakley project with a joint-use pool above elevation 621 feet or which would cause periodic flooding stages to persist in Allerton Park for longer than seven days during the growing season (April through September) or 14 days during the dormant season, periods defined by university scientists as the maximum tolerances for bottomland vegetation.\textsuperscript{95}

The studies of alternatives by Harza and the Corps had convinced the Trustees that the purposes of the Oakley project could, and should, be achieved without sacrificing Allerton Park. Much of the public shared this view. The crucial factor now became the attitude of Governor Ogilvie.

C. The State's "Waterways Alternative"

1. The May 1969 Version

John Guillou and the Ogilvie administration decided that none of the Corps' alternatives were acceptable or would receive the support of all interested groups. Pursuant to their discussions, a new proposal was developed by the Division of Waterways and presented to the appropriations committees during their June 1969 hearings on the Corps' budget for fiscal year 1970. This "Waterways Alternative" proposal was signed by state, university, and Decatur officials on May 29, 1969.\textsuperscript{96} The

\textsuperscript{93} Champaign-Urbana News-Gazette, May 15, 16 and 17, 1969.
\textsuperscript{94} Champaign-Urbana Courier, May 18, 1969.
\textsuperscript{95} University of Illinois Comm. on Natural Areas, Regulation of Water Levels in the Oakley Reservoir for Preserving Natural Conditions at Allerton Park, May 7, 1969. See Minutes of May 21, 1969, meeting of the Bd. of Trustees of the Univ. of Illinois.
Illinois congressional delegation, the Illinois Nature Preserves Commission, and the Committee on Allerton Park supported this compromise, the terms of which were as follows:

1. Return to the 621-foot joint-use pool originally proposed by the Corps in 1962 (which would not permanently inundate any of Allerton Park).

2. Provision by Decatur of advanced waste treatment in lieu of all reservoir storage for water quality control.

3. Great increase in water supply storage, and its relocation at an upstream reservoir on Friends Creek.

4. A doubling of the flood release rate over Oakley dam, which would permit reduction in the size of the Oakley flood control pool and would cause Allerton Park to be flooded less frequently and for shorter periods.\(^97\)

5. No channelization of the Sangamon below Lake Decatur.

6. Acquisition in fee of 22,500 acres of downstream flood plain for a 98-mile floodway and recreational greenbelt.\(^98\)

7. Payment of all nonfederal costs associated with the project by the State of Illinois, replacing the city of Decatur as local sponsor of the project.

The feasibility of the state's plan hinged on (a) benefits to be derived from the tributary reservoir and the greenbelt, and (b) treatment of them and the Oakley reservoir as a single economic unit.\(^99\) The Oakley reservoir alone would generate even less water supply and flood control benefits than under the 1962 plan and the Corps already had conceded that its 1962 plan was no longer economically feasible.\(^100\)

The Corps did not comment on the Waterways Alternative at the June 1969 Congressional hearings.\(^101\)

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97. Park flooding would be within the guidelines which the University trustees had established. See text accompanying note 95 supra.

98. This would include 12,000 acres which the Corps' proposals would have protected, would be subject to flooding due to the increase in flood release rate and the absence of channelization. The greenbelt concept had never been incorporated in a Corps reservoir project before. Farmers downstream, whose lands would be purchased, opposed the greenbelt. Their spokesman denounced the plan, claiming that the river frontage was the most valuable part of their property and that the public would stray onto their lands and ruin whatever was not taken for greenbelt. *Hearings on 1970 Appropriations, supra* note 29, at 560-61. Conversely, downstream sportsmen and conservationists praised the concept and pointed out that the floodplain could be purchased for one-third of the estimated cost of dredging the streambed. *Id.* at 596-97.

99. See text accompanying note 214 infra.

100. See text accompanying note 84 supra.

101. After hearings the House Appropriations Committee stated that it would not recommend funds for construction of the Oakley project until a feasible plan for
2. Changes in July 1969

In July 1969 the Division of Waterways issued a detailed report on its Waterways Alternative. The report varied from the May 29 memorandum of agreement in two significant respects. The size of the downstream greenbelt and floodway was reduced by one-half, and, as a result, the flood release rate over Oakley dam was reduced from 7,000 cubic feet per second to a graduated rate of from 2,000 to 5,000 cfs, depending on the severity of the flood. These changes apparently were made in response to downstream farmers' strong opposition to the larger greenbelt and because of its adverse effect upon the project's economic feasibility. Critics suggested that the lower flood release rate would cause abnormally high flooding in Allerton Park on an average of at least once every four or five years, and during relatively high flood stages would violate the University Trustees' guidelines on the duration of artificial flooding. Mr. Guillou advised the Committee on Allerton Park that the Corps would insist on obtaining a flood easement in Allerton Park.

3. Reactions to the Revised Waterways Alternative


102. DIVISION OF WATERWAYS, DEP'T OF PUBLIC WORKS AND BLDGS., STATE OF ILL., Suggested Development, Oakley Reservoir & Sangamon River, "The Waterways Alternative," June 2, 1969 [hereinafter cited as Waterways Alternative]. Total first costs were estimated at over $43 million, and the benefit-cost ratio at 1.75. Id. at 38. Due to the large amounts of silt and other agricultural pollutants in the Sangamon and its tributaries, no recreation benefits from swimming were claimed, although the Corps had estimated that swimming would account for 40 percent of all recreation benefits. See text accompanying note 412 infra.

103. The acreage was reduced from 22,500 to 12,000 acres of which 9,200 would be available for recreation, and 2,800 would be channel bottom. Of the 10,500 acres to remain in private ownership, 6,000 would be protected from flooding by new dikes. Waterways Alternative, supra, note 102, at 25-26.

104. Id. at 27.

105. John Guillou stated at a meeting on May 4, 1970, that a 20,000 acre greenbelt would generate intense political opposition downstream and jeopardize federal funding of the project. Text following note 130 infra.

106. Letter from John C. Guillou to Bruce Hannon, Aug. 21, 1969. Earlier, he had indicated that the Corps probably would not have to acquire any land or easements in Allerton Park. Letter from John C. Guillou to Bruce Hannon, June 17, 1969. The July version of the Waterways Alternative was backdated to June 2, 1969, prior to the June 3 and 4 Congressional hearings at which only the earlier version of the plan had been discussed. The state forwarded only the later report to the Corps and other federal agencies for their reaction.
and demanded adherence to the May 29 agreement. Subsequently, in January 1970, the Committee urged the Corps to bring the top of the Oakley flood control pool down to the elevation of the downstream edge of Allerton Park to end the bickering over release rates, flood easements and the level of the joint-use pool. The Committee claimed that decreasing flood control storage actually would increase the benefit-cost ratio of the project, since the estimated benefit-cost ratio of the flood control purpose alone throughout the various Oakley proposals had been very near unity.

Farmers in the vicinity of the proposed Friends Creek reservoir complained that its joint-use and flood control pools, at the elevations proposed, would require the Corps to buy too much agricultural land and would impair the drainage of many farms and of the village of Argenta.

In November 1969 the U.S. Department of the Interior reported to the Corps on probable environmental impacts of the various Oakley alternatives. The Department concluded that the state's Waterways Alternative was preferable to all 15 alternatives proposed by the Corps, in light of the natural value of Allerton Park and an unchanneled lower Sangamon, and because advanced waste treatment at both Decatur and Springfield would be "more economical than flow regulation by a single purpose reservoir."

D. The "Modified Project"

1. The Corps and the Division of Waterways Agree on a Plan

In February 1970 the Division of Waterways announced the details of a "final project proposal," based on the July 1969 Waterways Alternative and prepared by the Corps. It was labeled the "Modified Project." Although its basic components were identical to those of the Waterways Alternative—Oakley reservoir on the Sangamon, a tributary reservoir on Friends Creek, and a downstream greenbelt—the Modified Project differed in three respects.

First, joint-use storage in the Friends Creek reservoir was to be reduced by 20,000 acre-feet, nearly 45 percent. Second, the level of the Oakley joint-use pool was to be raised to 623 feet, providing 4,000 acre-feet of additional storage and increasing the mean depth of the "average recreation pool" to six feet. Third, a flat flood release rate over Oakley dam of 5,000 cfs was substituted for the graduated release rate proposed by the Division of Waterways. It was asserted that this would produce shorter periods of man-made flooding in Allerton Park, despite the larger Oakley joint-use pool.

The report stated that the Friends Creek reservoir could be considered an "extension" or "sub-impoundment" of Oakley reservoir due to its capacity for replenishment by pumping from Oakley. This approach was an effort to avoid the need for new congressional authorization (to be based on an economic evaluation using the current, higher discount rate) for the project, since the 1962 authorization was for a single reservoir on the Sangamon. The increase in the elevation of the Oakley joint-use pool, from 621 to 623 feet, conveniently would cause it to extend just to the foot of Friends Creek dam, which apparently was thought necessary for the tributary reservoir to qualify as a sub-impoundment.

The report stressed that Governor Ogilvie's "prime charge" had been to develop a program both to "meet the project requirements" and to "save the bottomlands of Allerton Park," and claimed that this goal had been achieved. It was said that the project would not affect flooding in the Allerton bottomlands for flood events occurring more

112. The Friends Creek joint-use and flood-control pools were fixed at levels nine feet and six feet lower, respectively, than those proposed in the Waterways Alternative—apparently a concession by the Corps to protests by farmers and residents of Argenta. Id. at 8; Waterways Alternative, supra note 102, at 24.

113. Water stored in both reservoirs was to be released only for municipal water supply and for streamflow regulation to maintain canoeing depths and to cope with "noncontrollable types of stream pollution such as farm nutrients and surface runoff sediments." Id. at 5, 7. Due to drawdown, the average recreation pool is to be shallower than the normal joint-use pool, average depth of which the Corps projects as seven feet. Id. at 6; Corps of Engineers, Chicago Dist., Oakley Reservoir Project, Sangamon River, Ill., Recommended Development, May 1970, at C-17 (a more detailed description and analysis of the Modified Project, not released to the public until Dec. 1970) [hereinafter cited as Recommended Development]. The same document, repaginated, was later published as Senate Comm. on Pub. Works, 92d Cong., 1st Sess., Proposed Modification to the Authorized Oakley Reservoir Project, Sangamon River, Ill. (Comm. Print 1971).


115. Id. at 9.

116. See text accompanying notes 261, 262 infra.

117. See text accompanying notes 481 et seq. infra.


frequently than once in ten years, and that for less frequent events artificial flooding would not violate the University trustees' guidelines. The report urged the University to recognize the Modified Project as providing a "great opportunity" for long-range controlled research concerning the effects of water management upon river bottomland and upland ecosystems.\footnote{120}

2. Opposition Continues

Those who had denounced the July 1969 Waterways Alternative also attacked the Modified Project as soon as it was unveiled. The Committee on Allerton Park again urged that the level of the Oakley flood control pool not exceed 627 feet, the elevation at the lower end of the park.\footnote{121} The Oakley Reservoir Committee of the Piatt County Board of Supervisors insisted that "the Oakley Project be kept out of Piatt County," its chairman explaining that the county's farm land was too flat and productive for artificial flooding and Allerton Park "too valuable to risk on a Corps of Engineers project."\footnote{122} A citizens' committee at Argenta asked that the level of the Friends Creek reservoir be reduced further.\footnote{123}

On April 1, 1970, Harza Engineering Company reported to the University Trustees on its analysis of the Modified Project's hydrologic effects in Allerton Park. It found that at the new, fixed flood discharge rate, the frequency, depth, and duration of artificial flooding in the park would be substantially greater than indicated in the Division of Waterways' report.\footnote{124} Instead of occurring once every 10 or 15 years, artificial flooding could be expected about every four years.

\footnote{120}{Id. at 18. The May 29, 1969, agreement provided that any substantial alteration of its provisions without unanimous consent of all the parties would void the agreement. Memorandum of Agreement, supra note 96. Prior to announcing the Modified Project, John Guillou restated that the consent of Decatur and the University would be required. Champaign-Urbana News-Gazette, Feb. 7, 1970, at 3. When he released the report, Guillou requested consent within two weeks, to coincide with the appropriations hearings in Washington. When publicity revealed this pressure, Guillou denied that any deadline was intended. The University indicated it would not be pressured. Champaign-Urbana News-Gazette, Feb. 15, 1970, at 3, Champaign-Urbana Courier, Feb. 13, 1970, at 3.}

\footnote{121}{Champaign-Urbana News-Gazette, Feb. 16, 1970, at 3.}

\footnote{122}{The Board cited the Corps' Carlyle reservoir in southern Illinois, where the planned flood release rate had been cut by 50 percent after the project went into operation, causing widespread flooding upstream. Champaign-Urbana Courier, Feb. 26, 1970, at 3. See note 77 supra.}

\footnote{123}{Champaign-Urbana News-Gazette, Feb. 25, 1970, at 3.}

\footnote{124}{Two Corps errors were responsible for this. One was a computation error. The other was that the Corps had considered the reservoir's effect only at the upstream end of the park, not at the lower end or intermediate points where the effect would be more severe. Letter report from Harza Engineering Co. to Bd. of Trustees of the Univ. of Illinois, Apr. 1, 1970.}
Moreover, the flooding would be considerably greater than with the 7,000 cfs discharge rate agreed upon in May 1969. Also, at 623 feet the Oakley joint-use pool would extend upstream through Allerton Park, although the water level would be below the top of the stream banks, creating a standing pond rather than a flowing stream.126

On April 30 the University's faculty Committee on Natural Areas unanimously recommended adherence to the May 29, 1969, agreement and rejection of the Modified Project.126 The committee relied on Harza's analysis and on additional data supplied by the Corps. It concluded that a change in the zonation of tree species and herbaceous plants from the river's edge to the upland would occur, animal populations would be reduced, and those species which live only in flowing water would disappear. The committee summarized its views as follows:

With any change in the flooding pattern, there must follow readjustment in the ecosystem. . . . The readjustment is to a new set of deliberate man-made conditions . . . [which] deviates from the natural and the primitive.

It is essential in ecological research, as in all research, to have controls and checks, where natural processes may be analyzed free of outside disturbances. . . . The Modified Project certainly will not destroy the floodplain ecosystem; however, it will greatly detract from its usefulness as a natural area.127

On May 1 the Illinois Nature Preserves Commission wrote to Governor Ogilvie and the University Trustees in opposition to the Modified Project, stating that it would reduce or destroy the natural values which had prompted the Commission to recommend inclusion of Allerton Park in the state Nature Preserves System.128 The Commission urged the state and the University to adhere to the May 1969 Waterways Alternative.

3. The University of Illinois Acquiesces

The University's decision was known to be critical in determining whether there was to be an Oakley project and, if so, what form it would take.129 On April 21 the chairman of the Decatur

125. Id. at 5 et. seq.
126. Committee on Natural Areas, supra note 33.
127. Id. at 9-10.
129. The Board of Trustees had delegated authority to make the decision to its three-person executive committee, which was to receive a recommendation from the President's Advisory Comm. on Allerton Park. The latter body, composed largely of administrators, had been created in the late 1950's to oversee operation of the mansion, park and farms received from Robert Allerton. In June 1967, during the early stages of the Oakley controversy, the President had appointed a faculty advisory committee to
Chamber of Commerce Committee on Oakley Reservoir wrote to the president and trustees of the University, saying that they had delayed long enough in reaching a decision and concluding, "If the University is to be the one to finally kill this project, we might as well find it out now. Either kill it or approve it. It has been stalled long enough."

On May 4, 1970, the University's President's Advisory Committee met to formulate its recommendation to the Board of Trustees. John Guillou and representatives of the Corps appeared and urged approval of the Modified Project. Guillou had prepared a revised memorandum of agreement to replace the May 1969 agreement. The memorandum provided that the University would be consulted in the development of an operational plan for the Oakley reservoir and would have two representatives on a thirteen-person Sangamon Basin Water Management Committee. The revised agreement further provided for staged increases of the joint-use pool up to the authorized 623 foot level. It also provided that "[n]othing herein shall pre-empt the authority of the Corps of Engineers to make releases greater than 5,000 cfs."

The implication was that if the University declined to sign the agreement, it would forego a voice in the management of the reservoir and would run the risk of an operational plan more harmful to the park.

When the Board of Trustees' executive committee met on May 6, 1970, the President's Advisory Committee recommended accepting the Modified Project. The advisory committee reported that it had balanced investigate possible ramifications of the project for the University. It was the faculty advisory committee which first recommended that the University retain an engineering consultant to study alternatives to the Corps' 1966 plan. The President's Advisory Committee became concerned over "leaks of study materials" to local newspapers and let the faculty advisory committee die after six months work. Thereafter, the University's Committee on Natural Areas, by way of the President's Advisory Committee, was the only source of faculty input to the administration concerning the effects of Oakley on Allerton Park.

130. Letter from T.W. Samuels to David Henry, Apr. 21, 1970 (emphasis in original).


132. Less than two years earlier Guillou had stated that mainstream reservoirs were not appropriate in the central Illinois flatlands and that an Oakley reservoir on the Sangamon was a mistake, but unavoidable due to political momentum. Yet, after having involved the Division of Waterways in the planning of several Corps reservoirs in the State, Guillou had become one of Oakley's strongest advocates, pressing it on the legislature and the Governor, whose own environmental advisers subsequently admitted to having tried to kill the project at the federal level in the executive office of the President. Telephone conversation with Michael Schneiderman, Director of the Ill. Inst. for Environmental Quality, Dec. 22, 1970. Guillou now claimed his job was to see that Illinois got its "fair share" of the federal budget. See Champaign-Urbana News-Gazette, May 7, 1970, at 3.
the scientific and educational values of Allerton Park against public
demands for water and had concluded that the advantages of the
Modified Project outweighed its disadvantages. One factor found to
support the project was that it would provide opportunity to study the
biological effects of periodic artificial flooding in a natural area.\textsuperscript{133}

Dr. S.C. Kendeigh, chairman of the University's faculty Committee
on Natural Areas and vice-chairman of the Illinois Nature Preserves
Commission, implored the trustees to reject the Modified Project to
preserve the educational and research value of Allerton Park as a
natural area.\textsuperscript{134} He was supported by Bruce Hannon of the Committee
on Allerton Park, and by more than 80 telegrams the trustees received
in the course of the meeting.

The members of the executive committee and the other trustees
present obviously were displeased with the changes in the May 1969
plan. The chairman of the Buildings and Grounds Committee, Ralph
Hahn, who was the member most knowledgeable about the park, rec-
commended that the executive committee accept the new plan to assure
the University a voice in the management and operation of the project,
so that it could not be enlarged or changed further. Guillou assured
the trustees that the new agreement contained no provision for future
modifications. Reluctantly, the executive committee approved the Mod-
ified Project, and the President of the Board of Trustees signed the re-
vised memorandum of agreement.\textsuperscript{135} At congressional hearings on ap-
propriations a week later, Mr. Hahn testified in support of the Modified
Project, concluding his statement, however, by noting that the Corps
might have underestimated the extent and effects of artificial periodic
flooding in Allerton Park.\textsuperscript{136}

\textsuperscript{133} "Hopefully," stated the committee, "this research will provide a nation-wide
basis for considering the biological implications of future projects," a basis said to
be nonexistent at that time. Report and Recommendations of the President's Advisory
Comm. on Allerton Park, May 6, 1970.

\textsuperscript{134} Kendeigh noted that the University soon was to establish an environmental
studies institute and questioned how it could permit the destruction of its most valuable
natural environment. He added that the National Park Service had tentatively ap-
proved designation of the Allerton forests as a National Natural Landmark, but that
the Modified Project probably would render the area ineligible. Champaign-Urbana

\textsuperscript{135} \textit{Id.}

\textsuperscript{136} \textit{Hearings on H.R. 18127, supra note 131, at 2124.} Representatives of the
Committee on Allerton Park, the Illinois Nature Preserves Commission, the Piatt
County Board of Supervisors, and other local interests also spoke at the hearings in
opposition to the Modified Project. \textit{Id.} at 2094-119. The Allerton Committee stressed
not only that the project threatened the park, but also that the Corps exaggerated its
flood control and recreation benefits, that the nitrate content of the reservoir water
supply would be dangerously high for drinking, and that wells in the Mahomet Valley
aquifer would provide a cheaper and better source of water for Decatur. \textit{Id.} at 2096,
2114 et seq.
4. Other Federal Agencies Yield

On July 1, 1970, the Secretary of the Army transmitted to the Bureau of the Budget and the Council on Environmental Quality (CEQ) the Corps' proposed report to Congress on the Modified Project. The Allerton Committee obtained a copy of the environmental impact statement, but the remainder of the report was withheld from the public for six months. During that period, federal agencies concerned with budgetary control and environmental protection gradually succumbed to political pressure in support of the Modified Project.

Since early 1969 the Bureau of the Budget had impounded all Oakley appropriations for land acquisition and preparation of working drawings because it viewed the project as a poor federal investment. But in November 1970, despite increased project costs and exaggerated benefits, the Bureau's successor, the Office of Management and Budget (OMB), advised the Secretary of the Army that it did not object to submitting the report to Congress. On December 31, 1970, the Secretary of the Army announced that OMB had ended its two-year impoundment of Oakley funds.

The Committee on Allerton Park and the Illinois Nature Preserves Commission had complained strongly to the CEQ about the Corps' sketchy environmental impact statement on the Modified Project.

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137. Recommended Development, supra note 113. Of the 290-page document, the environmental impact statement occupied only ten pages. Id. at D-12 through D-21. This was the first final NEPA impact statement prepared by the Corps for any of its reservoir projects. Council on Environmental Quality, Federal Agency Compliance with Section 102(2)(C) of the National Environmental Policy Act, Aug. 1970, at 15.

The Committee on Allerton Park had advised the Secretary of the Army that a court injunction would be sought immediately if the Corps attempted to acquire any land for the project before issuing a five-point environmental statement as required by section 102 of NEPA. Letter from Bruce Hannon to Stanley B. Resor, June 1, 1970. Although the Corps previously had not submitted a draft statement, the CEQ took the position that prior to issuance of its revised guidelines on April 23, 1971 [36 Fed. Reg. 7724 (1971)], the requirement for submission of "draft" and "final" statements was obscure and that statements filed before July 1, 1971, the effective date of the revised guidelines, should be considered "finals". Letter from Stephen F. Sloan, staff member of CEQ, to Bruce Hannon, May 25, 1972.


139. The first costs of the Modified Project now were estimated at $65.5 million, rather than the $49 million reported to Congress in March 1970, and the benefit-cost ratio was admitted not to exceed 1.15. Recommended Development, at 22-23.

140. See generally Part III infra.


143. They argued that the impact statement seriously understated hydrologic and biological changes likely to occur in Allerton Park and that it completely failed to de-
But CEQ had been relying on OMB to kill Oakley, and when OMB did not, CEQ decided not to challenge the Corps openly either on the adequacy of the impact statement or on the merits of the project. Unofficially, Council staff spoke critically to the Army about the statement, but CEQ declined to comment officially.144

In May 1970 Secretary of the Interior Walter Hickel had told a representative of the Committee on Allerton Park that he would approve the park as a natural landmark in early June.145 A month later, when the Secretary had not acted, the Committee accused Congressman Springer of pressuring the Interior Department to delay action due to possible adverse effect on the Oakley project. The congressman denied the charge, claiming to be unaware that the park had been proposed as a landmark.146 On December 4, 1970, the day after the Corps announced that both OMB and CEQ had “approved” the Oakley project,147 the Chicago Sun-Times reported that Hickel had signed papers approving Allerton Park as a natural landmark in February 1970, but that public announcement of the action had been delayed by the Corps and Congressman Springer.148

On December 10, Senator Percy and Congressman Springer jointly

scribe the loss which would occur in the park’s research value. The statement was silent about the effect of the project on mammals in the park and incorrectly stated that there would be no change in the ecosystem of the stream, which in fact would become a pond unable to support animal species living only in flowing water. The statement did not seriously or accurately discuss project alternatives and failed even to mention the effects of nitrates and other reservoir pollutants on algae growth, water recreation, and potability. Letter from S.C. Kendeigh, Vice-Chairman of the Ill. Nature Preserves Comm’n, to Russell Train, Chairman of CEQ, Aug. 7, 1970; Committee on Allerton Park, Comments on Environmental Impact Statement, Aug. 14, 1970. The failure to discuss nitrate pollution was especially striking because the Secretary of the Army’s letter transmitting the Corps’ report to Congress on December 7 acknowledged that excessive nitrate concentration could prevent use of water from the project for potable consumption. Recommended Development, at i.

144. Among the reasons for this course of action were the belief that the Council could hope to oppose successfully only a limited number of projects, that the Oakley effort had strong political support and was well advanced, some land having been purchased in 1969, and that, from a national perspective, 800 acres of Illinois river bottom represented comparatively small stakes. Interviews with CEQ Washington staff members, Dec. 10, 1970 and Jan. 11, 1971. The Corps incorrectly reported that the Council had “approved” the project after finding that it would not adversely affect Allerton Park. Champaign-Urbana News-Gazette, Dec. 4, 1970; letter from Col. William G. Stewart, Acting North Cent. Div. Engineer, to Thomas E. Dustin, Indiana Div., Izaak Walton League of America, Dec. 14, 1970.


146. Id.

147. See note 144 supra.

announced that the Army had submitted its modified Oakley plan to Congress and that 1,000 acres of Allerton Park, labeled the Allerton Natural Area, had been designated for inclusion in the National Registry of Natural Landmarks.\textsuperscript{140} The Interior Department stated that the Oakley reservoir, nevertheless, was proceeding as planned, since it was compatible with the preservation of Allerton Park.\textsuperscript{160}

Opponents of the Oakley project were particularly disturbed about the claim of compatibility. The Corps' report to Congress had stated that a special flowage easement or license would be obtained over 1,100 acres in Allerton Park.\textsuperscript{151} The chairman of the Natural Areas Committee of Interior's advisory board on landmarks stated that his committee had never been asked to evaluate Allerton under a modified flooding pattern.\textsuperscript{152} The Corps' own Environmental Advisory Board, established by the Chief of Engineers in April 1970 with the announced purpose of furthering "mutual understanding and confidence" among the Corps, the conservation community, and the general public,\textsuperscript{153} had failed. The net result of the Board's activity was an attempt to mollify Oakley opponents through repeated promises of a complete review of the project that never were kept.\textsuperscript{154}

\begin{itemize}
\item 150. Dept. of the Interior, News Release, Dec. 10, 1970 (issued by Acting Secretary Russell, Secretary Hickel having in the meantime been dismissed by the President).
\item 151. Recommended Development, \textit{supra} note 113, at E-1.
\item 152. \textit{Statement by Dr. Durward L. Allen of Purdue Univ. during telephone conversation with S.C. Kendeigh, Dec. 15, 1970.}
\item 153. \textit{Office of the Chief of Engineers, News Release, Apr. 2, 1970. It was composed of six outside experts.}
\item 154. In September 1970 the board's chairman wrote the Committee on Allerton Park soliciting its assessment of the Oakley project. He said the Board had agreed independently to evaluate a number of controversial projects, including Oakley. \textit{Letter from Charles H. Stoddard to Bruce Hannon, Sept., 1970.} In December Stoddard sent identical "progress reports" to the Allerton Committee and the Illinois Nature Preserves Commission, recommending a complete Corps review of the whole project. \textit{Letters from Charles H. Stoddard to Jack Paxton and S.C. Kendeigh, Dec. 28, 1970.}
\item On December 31 the Secretary of the Army announced the end of the impoundment of Oakley funds, Champaign-Urbana Courier, Jan. 3, 1971. Stoddard characterized the authorization of renewed construction spending as premature, indicating that the Army knew of the Board's recommendation for a review of Oakley. Champaign-Urbana News-Gazette, Jan. 5, 1971. However, Washington spokesman for the Chief of Engineers stated his office had received no recommendation concerning Oakley from the advisory board. "If we do, we will of course consider it, because that's what we hired them for." \textit{Id.}
\item A few days later, following a meeting between Stoddard and the Chief of Engineers, an Army spokesman announced that a memorandum of the board's recommendation, hand-delivered to the Chief, contained no requests for further review of Oakley. The memorandum listed for total ecological restudy nine projects in preliminary plan-
\end{itemize}
5. **Opponents Take Legal Action**

a. **Federal Court Suit**

In October 1970 the Committee on Allerton Park and the Environmental Defense Fund of New York agreed to sue to enjoin construction of the Modified Project. Scientists conducting research in Allerton Park and farmers whose land would be taken also decided to join as plaintiffs, as did, somewhat later, the Piatt County Board of Supervisors.155

On January 29, 1971, plaintiffs filed suit in the U.S. District Court for the District of Columbia against the Secretary of the Army, the Chief of Engineers and the Corps of Engineers, seeking an injunction and declaratory judgment against the plan submitted to Congress on December 7, 1970.156 The complaint alleged nine causes of action under the National Environmental Policy Act of 1969, the Water Resources Planning Act of 1965,157 and other federal laws,158 as well as the Fifth, Ninth and Fourteenth Amendments to the Federal Constitution. Among the most significant charges of deficiencies in the Corps' planning procedures were that the agency had not filed an adequate environmental impact statement under NEPA or given proper consideration to the unquantified values of the Allerton natural area, to the damage which the project would cause there, or to alternatives which might avoid such damage. Plaintiffs further alleged that the benefit-cost ratio claimed for the project was grossly exaggerated because benefits were inflated, costs were ignored, and too low an interest rate was used to discount future benefits. They alleged that the Modified Project, with its second reservoir and downstream greenbelt, was so different from the project authorized by Congress in 1962 that it could not be built without new statutory authorization.

156. EDF v. Resor, Civil No. 248-71.
Defendants' answer to the complaint denied virtually all of plaintiffs' substantive allegations. Defendants posed lengthy interrogatories, most of which concerned the scientific value of the Allerton bottomlands. Settlement discussions were held in November 1971, focusing on two questions: (a) what amounts of change in the flooding pattern in Allerton Park would be acceptable to plaintiffs; and (b) what pool elevations and flood discharge rate accordingly would be required.¹⁵⁹

Meanwhile, local supporters of the Oakley project became concerned over the lawsuit and the Corps' seeming inaction. In the spring of 1971 the Decatur Chamber of Commerce and city officials organized the Sangamon Valley Association to "disseminate factual information" and promote the "hasty development" of Oakley reservoir.¹⁶⁰ In February 1972, represented by the Washington, D.C., law firm of Covington and Burling, Decatur and the Sangamon Valley Association successfully petitioned to intervene in the lawsuit and obtained a change of venue to the U.S. District Court for the Southern District of Illinois, in Springfield.¹⁶¹

Defendants and intervenors then moved to dismiss on grounds that the Piatt County Board of Supervisors and the landowner-plaintiffs had failed to answer all interrogatories and that the conservation organizations and scientists had not alleged facts sufficient to establish their standing to sue under the Supreme Court's decision in *Sierra Club v. Morton*.¹⁶² In October 1972 the court granted the motion with leave for all plaintiffs except the landowners to amend.¹⁶³

The amended complaint, filed three weeks later, alleged that both the Environmental Defense Fund and the Committee on Allerton Park had numerous members who "personally use and enjoy the area that would be adversely affected by the Oakley project, if completed, for

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¹⁵⁹. Although no further settlement discussions have been held, studies in progress may provide answers to these questions. An Allerton Committee scientist recently completed a doctoral dissertation on the correlation between the extent of natural flooding at various elevations in Allerton Park and the presence of different species of trees at those elevations, a study that should provide both data and methodology to solve the problem. E.H. Franz, A Probabilistic Model of a Flood Plain Forest: Prediction of Changes in Species Distribution Due to Variable Backwater Conditions During Reservoir Operation (1971) (unpublished thesis in Univ. of Illinois Lib.). Early in 1973, using additional information obtained from the Corps, Dr. Franz predicted tentatively that the Modified Project would produce 15 to 25 percent composite change in species distribution and number of trees in the Allerton bottomlands. Letter from Willard D. Klimstra, Chairman, Ill. Nature Preserves Comm’n, to Gov. Daniel Walker, Feb. 28, 1973.


¹⁶². 405 U.S. 727, 3 ERC 2039 (1972).

such activities as ecological research, hiking, nature study, ornithology, camping, picnics and observation of both plant and animal life." It also stated that the project would injure the scientist-plaintiffs in their research activities and that the Piatt County Supervisors and the citizens whom they represented would be adversely affected because of the "reduction in tax base and land values and consequent income therefrom resulting from the inundation of lands." The complaint pleaded as a new cause of action that the Corps had not obtained from the State of Illinois a legally enforceable agreement to furnish its required local cooperation (cost-sharing) for the project and that under recent federal law such an agreement must precede commencement of construction.\textsuperscript{164}

A month later the Piatt County Board of Supervisors voted 5 to 1 to withdraw from the Oakley suit.\textsuperscript{165} Some members either took a more favorable view toward the reservoir project or thought they could better mitigate its effect in Piatt County by cooperating with the Corps; the Board also was unhappy because it was not consulted or kept fully informed about the conduct and progress of the suit.\textsuperscript{166}

As of August 1973, nothing further had occurred in the federal suit. In September 1972 the Corps announced it had taken an option on a tract of land near the Oakley dam site and was negotiating for others. Plaintiffs advised the Justice Department that they would seek a preliminary injunction against further land acquisition if the activity continued, and such activity seems to have stopped.

*b. State Court Suit*

In December 1972 six Piatt County residents filed suit in state circuit court to enjoin state officials and the University of Illinois from "executing or making effectual agreements with the United States" relating to the Oakley project.\textsuperscript{167} All plaintiffs were citizens and taxpayers of Illinois, and four owned real estate in Piatt County. The four included the former chairman of the Board of Supervisors who in 1970 led the Board to join as a plaintiff in the federal suit and the one member of the current Board who dissented from its decision in 1972 to withdraw from that suit.\textsuperscript{168} The defendants were Governor Ogilvie, the Director of the Department of Transportation (formerly the Department of Public Works and Buildings), the Director of Conserva-
tion, the Auditor of Public Accounts, the State Treasurer, the Director of Finance, and all members of the University's Board of Trustees.

The complaint alleged that: (a) the Director of Transportation and the University trustees had executed an agreement in 1970 purporting to consent to the Modified Project; (b) pursuant to authority ostensibly granted in a 1970 act of the legislature the Director of Transportation had executed an "Assurance of Local Cooperation" in 1971 purporting to commit the state to pay all initial costs and annual operating costs allocated to water supply storage at Oakley, half the separable first costs, and all annual operating costs assigned to recreational stream-flow regulation and to recreation facilities in the greenbelt; and (c) defendant state officials soon were to execute further assurances and agreements with the United States purporting to commit state tax revenues over an extended period to insure construction. It further was alleged that the past and proposed agreements, the legislative authorization, construction of the reservoir and the changes which the reservoir would cause in the Sangamon River and Allerton Park had violated or would violate numerous laws: (a) the Illinois Environmental Protection Act of 1970 and certain water pollution regulations promulgated thereunder; (b) the Environment Article of the 1970 Illinois Constitution, which gives every citizen the right to a "healthful environment" and standing to enforce that right in the courts; (c) the "public trust" under which the University holds the park for the people of Illinois; (d) unspecified state constitutional, statutory and public policy requirements that pecuniary benefits to the citizens of Illinois from such a project must exceed costs to be paid out of state tax revenues; and (e) the separation of powers provisions of the state constitution which allegedly preclude legislative delegation of the power either to determine monetary benefits and costs or to commit tax monies for the distant future.

On the day the complaint was filed the court granted plaintiffs a temporary restraining order directing defendants not to sign or carry out any agreements with the federal government concerning the Oakley project. This order remained in effect until May 1973, when the court dissolved it. Subsequently the original complaint and an amended complaint were dismissed for failure to state a cause of action, and in August 1973 plaintiffs filed a notice of appeal.

169. ILL. REV. STAT. ch. 111 1/2, § 1001 et seq. (1971).
6. Political Developments Since 1970

At the urging of Congressman Springer, Decatur interests, and John Guillou, and over continued vocal opposition, Congressman appropriated additional planning and land acquisition funds for Oakley in fiscal years 1972 and 1973. At hearings of the Appropriations Committees in May 1971, the Allerton Committee presented a third petition, signed by 75,000 Illinois residents opposed to the Modified Project.

Despite the availability of land acquisition funds since December 1970, when OMB ended its impoundment of Oakley appropriations, the Corps has not bought any land, other than taking the option on one tract in September 1972. Late in 1971 Decatur businessmen flew to Washington on an unsuccessful trip to urge Senators Percy and Stevenson to get things moving.

In November 1971 Congressman Springer unexpectedly announced that he would not seek re-election in 1972. In that election the Oakley issue was defused, since all candidates for the congressional seat expressed unqualified support for the Corps' Modified Project. The winner was Edward Madigan, a Republican who, since the election, has been silent about the project.

Illinois voters also chose a new Governor in 1972, Democrat Daniel Walker. During his campaign against Governor Ogilvie, Mr. Walker declined to state a position on the Modified Project. His main theme was the need to limit state taxes and spending. When it was reported in 1973 that the state's share of Oakley's initial cost had risen from $14.2 million to $17.5 million and that the Corps hoped to "boost the sagging benefit-cost ratio" by developing the greenbelt for intensive recreation—a change which would increase both the capital cost to the state and its annual operation and maintenance obligation—project opponents thought that the new Governor might lend them aid.

175. They reportedly crowded into Mr. Percy's office and received "about four minutes" from the two Senators. Returning home the dissatisfied businessmen initiated the intervention of Decatur and the Sangamon Valley Association in the federal court suit. Interview with John Guillou, Mar. 9, 1972.
178. Recommended Development, note 113 supra, at C-36.
On May 4 members of the University of Illinois track club ran 65 miles from Allerton Park through Decatur to the State Capitol to deliver to Governor Walker the Allerton Committee's fourth petition, signed by 165,000 opponents of the Modified Project.\textsuperscript{181}

However, on May 10, 1973, at a meeting of the Decatur Chamber on Commerce, Governor Walker announced his support for the project, subject to five conditions to be satisfied before commencement of land acquisition.\textsuperscript{182} One condition was that he receive assurances from the Illinois Environmental Protection Agency that water quality in Lake Springer (Congress' new name for Oakley reservoir)\textsuperscript{183} would be acceptable.\textsuperscript{184} When questioned about a March 1973 report from that agency to him concluding that "significant aspects of [the lake's] water quality may be frequently unacceptable,"\textsuperscript{185} the Governor said he was unaware of it.\textsuperscript{186} Public disclosure of the previously confidential report dramatized the conflict between Oakley and agricultural interests. One of the state EPA's conclusions was that significant water quality improvement required more vigorous soil conservation practices and reduction in the use of chemical fertilizers throughout the upper Sangamon watershed.\textsuperscript{187} Immediately the president of the influential Illinois Agricultural Association declared that it would be "folly" for the Walker administration to go ahead with the project.\textsuperscript{188} By late May 1973, farmers from throughout the Sangamon watershed area were lining up with conservationists against Oakley.\textsuperscript{189}

In July the Committee on Allerton Park learned that because of

\begin{itemize}
  \item \textsuperscript{181} Chicago Sun-Times, May 6, 1973.
  \item \textsuperscript{183} Act of Oct. 27, 1972, Pub. L. No. 92-600, 86 Stat. 1326.
  \item \textsuperscript{184} The other conditions were: renegotiation of the water supply agreement between the state and Decatur to provide for reimbursement of the state's full costs; assurances that the claimed recreational benefits and costs were accurate; assurances that the project would not significantly increase periodic flooding or adversely affect the ecology in Allerton Park; and assurances that land in the flood control pool, above the joint-use pool, would be covered with foliage and satisfactory for recreation when not covered with water. Press Release, \textit{supra} note 182.
  \item \textsuperscript{185} Illinois Environmental Protection Agency, Report to Governor on Oakley Reservoir, Mar. 15, 1973, at i. The report said that the reservoir would be shallow, turbid, and nutrient-rich, with relatively high algae concentrations; that violations of the General Use Standards for fecal coliform bacteria and for phosphorus could be expected; and that the water would have concentrations of nitrate-nitrite nitrogen approaching or in excess of the level allowable for public and food processing water supply. \textit{Id.} at i.
  \item \textsuperscript{186} Decatur Herald, May 14, 1973. His office later announced that he had known of the report and taken it into consideration in formulating his conditions, but that he had thought the questioner was referring to a more recent report. Decatur Herald, May 15, 1973.
  \item \textsuperscript{187} EPA report, \textit{supra}, note 186 at 1-2.
  \item \textsuperscript{188} Chicago Sun-Times, May 14, 1973, at 3.
  \item \textsuperscript{189} Chicago Tribune, May 20, 1973, § 1, at 23.
\end{itemize}
new population projections, based on 1970 census data, the state Division of Waterways had reduced its estimates of Decatur's future water needs by one-third, without advising the governor. Only half the water supply storage earmarked for the city in the Modified Project would actually be required.\footnote{189a} When this information was made public, the governor's office requested a full report.\footnote{189b} In August John Guillou resigned as head of the Division,\footnote{189c} but as of September 1, 1973, there was no statement from Governor Walker, who previously had said that Decatur's water need was "the most persuasive argument, the one that proved decisive," in his approval of Oakley.\footnote{189d}

\section*{II

\textbf{ANALYSIS OF THE PLANNING OF CORPS RESERVOIRS}

The degree of federal participation in the development of the nation's water resources depends upon the purposes of the projects and varies from maximum responsibility for planning, to lesser responsibility for construction, and to a still lesser role in operation and maintenance. Corps regulations assess the federal role as that of "prime mover in . . . projects for navigation, irrigation, flood control . . . and shore protection."\footnote{189}

The major purpose of most reservoirs constructed by the Corps of Engineers is flood control. The Flood Control Act of 1936 established a policy that control of flooding of navigable waters and their tributaries is a proper federal activity delegable to the Army Corps of Engineers.\footnote{191} Subsequent laws have authorized attention to water sup-

\footnote{189a. In 1969 the Division of Waterways estimated that Decatur's total demand for water supply from all sources would be 58.3 million gallons per day in the year 2020. This figure was accepted by the Corps in formulating the Modified Project. See text accompanying notes 354-62 \textit{infra}. The Division now estimates that daily pumpage in 2020 will average 43.8 million gallons, of which 5 million gallons will be returned directly to Lake Decatur by a large industrial user. Hence, the net demand would be only 38.8 million gallons per day. Memorandum from the Committee on Allerton Park to Gov. Daniel Walker, July 24, 1973. The Modified Project provides for 21,600 acre-feet of new water supply storage for Decatur, enough to permit daily withdrawals of 42 million gallons from Oakley reservoir alone. See text accompanying notes 356-58 \textit{infra}.}

\footnote{189b. Chicago Sun-Times, Aug. 1, 1973, at 36.}

\footnote{189c. Champaign-Urbana News-Gazette, Aug. 16, 1973, at 2.}


\footnote{190. The Corp recognizes "a lesser degree of responsibility for the generation of power, the provision of water supply, the control and improvement of water quality, the conservation and enhancement of the fish and wildlife resource, and the provision of opportunities for outdoor recreation." Corps Reg. No. ER 1165-2-1 (Nov. 9, 1964).}

ply, recreational needs, pollution control and other purposes. In relation to these problems, the planning of Corps reservoir projects has suffered from two basic deficiencies: inadequate consideration of alternatives and faulty evaluation of benefits and costs.

A. Inadequate Consideration of Alternatives

Although official policies and procedures long have required federal agencies to "consider . . . [a]ll relevant means" by which water resource needs might be met, the Corps is known for its tendency to discount or ignore techniques not calling for construction of dams. The principal reasons for this proclivity are: (a) the narrow range of measures which the agency is legislatively authorized to implement and the resulting lack of incentive to consider whether another solution might be more desirable; (b) variations in the extent to which the federal government can or will share the costs of alternative solutions; (c) lack of broad public participation in the planning process; and (d) faulty benefit-cost analysis.

1. Mission Orientation

A grant of planning responsibility to an agency authorized to implement only a limited range of solutions suffers an inherent institutional limitation. Congress requires the Corps to examine such needs as water supply, water quality, and outdoor recreation facilities, but rarely authorizes the Corps to alleviate these needs except by means of multiple-purpose reservoirs whose purposes include flood control. Even with respect to its supposedly primary role of reducing flood losses, the Corps has been restricted largely to building structures for flood water retention. As a consequence, Corps planning has given little consideration to such alternatives as flood-proofing of buildings, flood insurance, flood-plain zoning, and public acquisition of the flood plain. The self-interest inherent in a continuation of its construction program causes difficulty for the agency in weighing objectively other means of achieving desired ends.

Other agencies reviewing Corps recommendations do not necessarily favor reservoirs. Such review, however, does not offset the

initial planning bias due to the Corps' strong political position in Congress, because agencies authorized to review each other tend to work out accommodations based more on self-preservation than on the public interest, and because even a relatively independent agency given only reviewing power without authority to make independent studies is seriously disadvantaged compared to the initiating agency.\(^{196}\)

Unsuccessful attempts at administrative reorganization to alleviate problems caused by the civil works functions of the Corps in the Department of the Interior to President Nixon's efforts to shift all water resources activities to a new Department of Natural Resources.\(^{197}\) Generally, the aim has been to broaden the agencies' orientation by authorizing a greater variety of techniques to deal with assigned tasks. Another approach would be to locate the planning and construction functions in separate agencies. A planning agency without special interest in certain kinds of solutions might consider more objectively the spectrum of possible remedies. However, little serious effort has been made along this line.

2. Variations in Federal Cost-Sharing

Because of variable cost-sharing rules, the most attractive solution to a water problem from a local point of view frequently is not the most economical or desirable from a national perspective.\(^{198}\) How-

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197. See \textit{Maass, supra} note 1, ch. 3.

198. The maximum percentages payable by the federal government on Corps projects vary significantly according to project purpose and type of cost, as the following table illustrates.

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<tr>
<th>Project Purpose</th>
<th>Maximum Federal Percentage of Costs</th>
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<tr>
<td></td>
<td>Construction</td>
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<tr>
<td>Flood Control</td>
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<td>Local Protection</td>
<td>100</td>
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<tr>
<td>Large Reservoir</td>
<td>100</td>
</tr>
<tr>
<td>Navigation</td>
<td>100</td>
</tr>
<tr>
<td>Hydroelectric Power</td>
<td>0</td>
</tr>
<tr>
<td>Municipal &amp; Industrial Water Supply</td>
<td>0</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Variable</td>
</tr>
<tr>
<td>Water Quality</td>
<td>100</td>
</tr>
<tr>
<td>Recreation; Fish &amp;</td>
<td>50 and 100†</td>
</tr>
<tr>
<td>Wildlife Enhancement</td>
<td></td>
</tr>
</tbody>
</table>

† The two percentages represent federal shares of separable and joint costs, respectively,
ever, even for a federal agency like the Corps, institutional and legal constraints cause decisionmaking on the basis of national rather than local interests to be difficult. Two factors tend to give local economic interest groups substantial bargaining power in the planning process—their substantial influence in Congress on public works matters and laws requiring a degree of local cost-sharing as a condition to the construction of most federal water projects.

The first factor is a product of Congress' method of handling porkbarrel legislation. This method, commonly known as "log-rolling," involves mutual support by Congressmen of their colleagues' pet local projects. Because most Congressmen are less concerned whether particular federal water projects are formulated in the national interest than whether the projects satisfy their Congressional sponsors, an individual Congressman who waits his turn virtually can place his order for a dam and speak for Congress concerning its design. But that except that if these purposes are to be achieved by streamflow regulation, the 100 percent figure applies. See H. MARSHALL and V. BROUSSALIAN, FED. COST-SHARING POLICIES FOR WATER RESOURCES 99-101 (U.S. Dep't of Commerce, Nat. Bureau of Standards, 1972); text accompanying notes 371, 475 infra. As an example, costs of acquisition of land for a greenbelt below Oakley dam would be borne entirely by the federal government as a flood control device, although the state's main interest is its recreation potential. Where the same land acquired by the state for recreation in the absence of a reservoir, the maximum federal contribution would be 50 percent. Land and Water Conservation Fund Act, 16 U.S.C. § 4601-8 (1970).

Apportionment of costs between the federal government and local interests depends not only on cost-sharing rules but also on the method of cost-allocation. While cost-sharing rules prescribe the relative proportions of the costs of each project purpose to be borne by the federal agency and by local interests, cost-allocation methods assign the total costs of multiple-purpose projects among the various purposes so that the appropriate cost-sharing rules can be applied. Since most reservoir projects now have multiple purposes, cost-allocation is an important factor in fixing the proportion of total project costs ultimately to be paid by nonfederal interests.

The cost-allocation method generally used by the Corps is the "separable costs-remaining benefits" method. The Corps assigns to each project purpose its separable costs plus a portion of joint costs. The separable costs of a purpose are the incremental costs of including that purpose in the project. Joint costs are the amount by which total project costs exceed the sum of separable costs. Joint costs are allocated to each purpose in proportion to its remaining benefits, i.e., the dollar amount by which the estimated monetary benefits from a purpose exceed its separable costs. Hence accurate estimates of project benefits are essential to the proper allocation of joint costs. Since a large proportion of the total costs of a multiple-purpose project often are joint costs, their allocation is a crucial determinant of the total amount charged to local interests. MARSHALL & BROUSSALIAN, supra, at 32.

199. See Hart, Crisis, Community, and Consent in Water Politics, 22 LAW & CONTEMP. PROBS. 510, 528-29 (1957); National Water Comm'n, supra note 2, at 10-55; Maass, Congress and Water Resources, 44 AMER. POL. SCI. REV. 576 (1950).

200. For example, in 1969 when Oakley opponents seeking deauthorization of the project approached a Democratic Congressman from Chicago on the House Committee on Public Works, he immediately said he would not support such action regardless of its merits because the Republican Congressman from Champaign was an old friend who
Congressman typically is sensitive to the desires of the local interests which usually have initiated and stand to gain the most from reservoir projects: industry, labor and trade organizations, contractors, land speculators and developers, and financiers.\textsuperscript{201} Those interests thus have leverage in dealing with the Corps, which considers itself primarily responsible to Congress.

The second source of local bargaining power is the federal cost-sharing requirements. Complete federal funding is available only for those few projects having flood control and/or streamflow regulation as their sole purposes.\textsuperscript{202} Since the Corps has a natural interest in maintaining and expanding its building program, the requirement of local cost-sharing gives local interests power to block projects by refusing to pledge their share of costs. This veto power, combined with local groups' influence in Congress, provides a substantial base from which to bargain for Corps planning approval of measures which maximize federal cost-sharing. The Corps tends to ally itself with the local promoters and to permit them to dictate many planning decisions.\textsuperscript{203} In this way numerous alternatives, often the best and least expensive from a national point of view, are rejected or not even considered.

3. **Lack of Broad Public Participation in Planning**

Corps planning generally begins when local economic interest groups induce their Congressman to secure authorization for the Corps to make a survey investigation. The proponents then press the District Engineer for a report finding a reservoir project economically feasible, describing its purposes and basic design, and recommending construction. If the Corps' report is favorable, the local interests then urge their Congressman to obtain Congressional authorization and funding for detailed planning and construction.

Traditionally, the general public has been little involved in the planning of Corps projects. Even in the new era of environmental awareness, when groups occasionally have organized to oppose a destructive or unnecessary project,\textsuperscript{204} such action usually has occurred only after the Corps has completed its survey investigation and report, having taken a public position favoring a project and recommending its form.

\[\text{could be counted on to support federal highway projects in Chicago. Interview with Congr. John C. Kluczynski, Jan. 28, 1969.}\]


\textsuperscript{202} Supra note 198.

\textsuperscript{203} Fox & Herfindahl, *supra* note 201, at 199-200.

This is too late for effective public input in the decision-making process. Such delayed reactions are attributable not only to the difficulty of mobilizing noneconomic interests but also to a frequent lack of adequate public information and awareness during early planning stages.

Still, as the Oakley case demonstrates, environmental groups can have substantial effect upon reservoir planning. The Corps tends to respond to vocal interest groups, not only out of concern for the political sensitivities of the local Congressman and his importance under the log-rolling system, but also because of the position of the District Engineer, the career military officer chiefly responsible for recommending and planning projects.

The District Engineer is the Corps' chief public spokesman. He is assigned to a district for only two or three years and then is rotated elsewhere. He does not wish to prejudice his career by becoming the center of political controversy during this relatively short tour of duty. Hence he typically will avoid advocating a particular project until interested local groups have expressed their views and, hopefully, reached a consensus concerning its form.205

Until recently the Corps' practice, as illustrated by the Oakley case, was to hold public hearings at the outset of a survey investigation when few people were even aware that a dam was under consideration or had the vaguest notion of its full implications. Hearings would again be held after the District Engineer had reached his conclusions.206 The practical effect of such scheduling was to insure that hearings would be monologues rather than dialogues, either too early or too late for the general public to contribute useful factual data or informed opinions for the planners to consider in formulating their recommendations.

Late in 1970 the Chief of Engineers announced a new policy. "Public meetings," as the hearings now were to be called, would also be held at the "formulation stage" of each investigation "when all alternative solutions are reasonably known but before a plan has been selected," and at a later stage when a solution has been "tentatively selected" but before completion of the survey report.207 This procedure

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205. See Hart, supra note 199, at 530.
206. Corps Reg. No. ER 1135-2-5, §§ 4, 7 (Apr. 14, 1967) provided for public hearings in connection with preparation of survey reports and "whenever there appears to be sufficient public interest to justify such action." Yet in 1968, when the controversy over the Corps' 1966 plan for a 636-foot Oakley joint-use pool had been in the headlines for months, the Corps responded to pleas for public hearings by saying that it "has kept the concerned segments of the public informed through a variety of means." Letter from Ferd E. Anderson, Jr., Ass't Director of Civil Works for Central Divs., to Lawrence C. Bliss, Mar. 4, 1968.
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is more conducive to meaningful public participation in the planning process, though its effects are not yet known. In view of the District Engineer's usual interest in avoiding unpleasant controversies, the new hearing procedures offer environmentalists opportunity to press for consideration of previously unexamined alternatives at a timely stage of project development.

B. Faulty Evaluation of Benefits and Costs

The Flood Control Act of 1936 provided that the Corps of Engineers may undertake improvements for flood control and allied purposes "if the benefits to whomsoever they may accrue are in excess of the estimated costs." Executive interpretation of this statute produced various analytical procedures to evaluate the benefits and costs of proposed projects, the principal feature being a national economic efficiency analysis. In 1961 President Kennedy requested the Secretaries of the Army; Interior; Agriculture; and Health, Education, and Welfare (HEW) to review existing evaluation practices and recommend improvements. Their report, in the form of an agreement now generally referred to as Senate Document 97, was approved by the President in 1962 and since has governed the planning of water resources projects by agencies within those departments.

Although Senate Document 97 pays lip service to environmental quality and consideration of alternative means to solve water resources problems, national economic efficiency is the dominant objective with which formal project analysis and evaluation have been concerned. Although "intangibles" may be discussed, "tangible" benefits and costs that can be expressed in monetary terms have been stressed. Since, by definition, intangibles are not measurable in monetary terms, no project or project purpose has ever failed a benefit-cost analysis due to costs such as the loss of a unique natural area, or the loss of future options by an irreversible commitment of resources.

209. S. Doc. No. 97, supra note 20. This agreement probably will be superseded by the Water Resources Council's currently proposed "Principles and Standards for Planning Water and Related Land Resources," 36 Fed. Reg. 24144 (Dec. 21, 1971) [hereinafter cited as Proposed Principles and Standards], if Congress and the executive branch can resolve their differences over the discount rate to be employed. See text accompanying notes 266-69 infra. [Ed note: On September 4, 1973, President Nixon signed a revised version of the Council's proposed Principles and Standards. 38 Fed. Reg. 24778, Sept. 10, 1973. They became effective October 25, 1973, and provide, inter alia, that a discount rate of 6½ percent shall be used in evaluating new projects and some previously authorized but unfunded projects.]
210. S. Doc. No. 97, supra note 20, at 1-3; Proposed Principles and Standards, supra note 209, at 24151.
211. S. Doc. No. 97, supra note 20, at 8.
212. See Krutilla, Conservation Reconsidered, 57 AMER. ECON. REV. 777, 778-83 (1967).
Planning under Senate Document 97 has sought less to find the best way to solve a given set of water-related problems, than to determine whether a federal project at a particular site would be "economically feasible" and, if so, what its design and scope should be.\textsuperscript{213} The basic constraint is that the government only shall undertake projects (and increments in the scale thereof) for which the benefits exceed the costs. For a particular project to be justified, the benefit-cost ratio must exceed 1.0, not only for the entire project but also for each of its separable purposes.\textsuperscript{214} The policy is to maximize net benefits, not the benefit-cost ratio, on the theory that maximum economic production from the resources committed to the project will be achieved thereby.

All projects found economically justified are equally eligible for submission by the investigating agency to Congress for authorization and funding, whether their benefit-cost ratios are 2.01 or 1.02. For purely political reasons the agency may submit the least efficient projects, just as Congress may authorize and fund such projects.\textsuperscript{215} Since Congress often does act favorably on projects with low ratios and unfavorably on ones with higher ratios,\textsuperscript{218} the principal result of benefit-cost analysis appears to be the elimination of those projects which the investigating agency or OMB considers blatantly infeasible.

The analytical criteria applied often are unsound, resulting in projects being labeled justified when realistic economic appraisals would show costs exceeding benefits.\textsuperscript{217} Yet Congress displays little desire to tighten the procedures, wishing to retain its substantial freedom to provide for construction of projects on grounds other than economic efficiency.\textsuperscript{218} Congressional support of water projects is intended largely to subsidize local and regional economic development, rather than to promote national economic efficiency.\textsuperscript{219} Moreover, the strongest citizen opposition to such projects usually stems from a concern for environmental protection, not for economic efficiency.\textsuperscript{220} Accordingly, the proposed standards recommended by the Water Resources Council to replace Senate Document 97 omit all reference to benefit-cost ra-

\textsuperscript{213} See \textit{National Academy of Sciences, Alternatives in Water Mgmt} (1966).
\textsuperscript{216} \textit{Id.} at 44-51, 107-117.
\textsuperscript{217} \textit{Id.} at 109-117.
\textsuperscript{218} \textit{Id.} at 50. See text accompanying note 266 infra.
\textsuperscript{220} \textit{Id.}
tions and would compare benefits and costs in terms of net benefits under each of four separate accounts: national economic development, environmental quality, regional development, and social factors.\textsuperscript{221}

The following discussion outlines some recurring deficiencies in benefit-cost analysis as applied by the Corps of Engineers.

1. \textit{Underestimation of Monetary Costs}

Although the Corps claims to be liberal in estimating the costs of land acquisition, utilities relocation, and reservoir construction,\textsuperscript{222} studies have shown a consistent pattern in which actual costs far exceed estimates in spite of generous contingency allowances.\textsuperscript{223} The Corps attributes the cost overruns to inflation in land values and construction costs and to changes in project plans during the post-authorization design and engineering stages.\textsuperscript{224} Both factors involve interesting considerations.

Land prices and construction costs generally have increased in most areas. The Corps claims that this inflation has no significant effect upon the benefit-cost ratio of a multiple-purpose project, because "as costs rise, so do benefits."\textsuperscript{225} In fact, however, the dollar values of some principal benefits cited in justification of reservoir projects have not risen as sharply as costs. One such benefit, especially prior to this year, was flood protection for agricultural lands, particularly those that produced surplus crops which the government had to buy and store.\textsuperscript{226} Another example is water quality control, the value of which the

\textsuperscript{221} Proposed Principles and Standards, \textit{supra} note 209, at 24173-94 [approved by the President in revised form on Sept. 4, 1973]. The River and Harbor Flood Control Act of 1970, Pub. L. No. 91-611, § 209, 84 Stat. 1818, prescribed these objectives, which had been recommended in \textit{WATER RESOURCES COUNCIL, REPORT BY THE SPECIAL TASK FORCE, FINDINGS AND RECOMMENDATIONS} (July 1970).


\textsuperscript{226} Much of the land in the lower Sangamon valley to be protected by the Oakley project, especially under the 1962 and 1966 plans, for years has been contributing to a national surplus of corn and soybeans or has been kept out of production under the Department of Agriculture’s idle acres program.
Corps customarily has equated to the cost of a single-purpose reservoir for low-flow augmentation. Although the cost of that alternative presumably has climbed at the same rate as the cost of a multiple-purpose reservoir, the cost of achieving water quality through advanced waste treatment has decreased as it has passed beyond the experimental stage. In the Oakley project the Corps finally admitted in 1969 that the cost of advanced waste treatment should be employed to measure the value of streamflow regulation because such treatment had become less costly than a single-purpose reservoir. Thus the assumed monetary value of improved water quality suddenly dropped. Improved water recycling likely will have a similar restraining effect upon the value of reservoir storage for water supply.

In blaming post-authorization changes in plans for increased costs, the Corps suggests that someone else is responsible for such changes and for the lack of foresight they imply. To a limited extent this is true. By authorizing most projects years or even decades before construction funds can be appropriated, Congress encourages careless preliminary planning, enhances the opportunity for local interests to obtain self-serving amendments, and increases the likelihood that changes in technology and land use will necessitate plan alterations. Further, by legislation such as that encouraging addition of storage for streamflow regulation to previously authorized projects, Congress explicitly invites their expansion. Nevertheless, the Corps bears a good share of responsibility for post-authorization changes leading to increased costs. As has been noted elsewhere, engineers are possessed by an urge to build reservoirs which utilize the full physical potential of their sites, even though changing technology tends to produce better non-reservoir methods of achieving project purposes. The practice of enlarging reservoirs during the detailed design and engineering stage is a long-standing one. The Corps could foresee many project alterations prior to authorization, but nevertheless does not propose them initially, in part because higher costs and lower benefit-cost ratios would make the projects seem economically less attractive.

2. Disregard of Environmental Costs

Senate Document 97 recognizes that the nation's long-term interest requires that:

227. See text accompanying notes 468-72 infra.
228. See National Water Comm'n, supra note 2, at 10-67.
229. See text accompanying notes 314 et seq. infra.
230. Fox & Herfindahl, supra note 201, at 201.
There be protection . . . of resources to insure availability for their best use when needed. . . . Areas of unique natural beauty, historical and scientific interest be preserved and managed primarily for the inspiration, enjoyment and education of the people.

Yet in 1968 the President's Council on Recreation and Natural Beauty reported that environmental values had been ignored or relegated to low priority in assessing project feasibility. Preservation values are regarded as intangible. They are omitted from benefit-cost calculations because economists have not formulated reliable methods of stating them in dollar terms.

The method by which the 1966 proposal fixed the value of Allerton Park land to be inundated is illustrative. The Corps admitted that no special value was attributed to the land beyond the per-acre price it would bring if sold by a private owner to one who wished to clear and farm it. The present Oakley plan, under which the Corps would acquire no Allerton land in fee but would require a flowage easement involving 1100 acres, allocates no cost whatever for either the easement or the loss of natural values.

Market values generally fail to reflect adequately special features of unique natural areas, such as the size, diversity and relatively undisturbed condition of Allerton Park forest ecosystems and the existence of detailed scientific data about them collected over a 40-year period. Individuals' willingness to purchase such areas is not influenced by the cost of compensating present and future generations for deprivation in perpetuity of the opportunity to use them. While the areas are of substantial "option value" due to their irreplaceability and the absence of close substitutes, it is difficult to organize a market for them, as is generally the case for public goods.

[233. Little attention has been given to the problem of measuring the environmental values that may be affected or destroyed . . . and comparing their benefits with those of proposed projects. The result is that natural beauty or other environmental values usually have been considered, if at all, only as an afterthought—only after the project has been determined to be feasible by conventional cost-benefit calculation. Project planners have seldom rejected an "economically feasible" project on grounds that it would destroy natural [values]. President's Council on Recreation and Natural Beauty, From Sea to Shining Sea 235 (1968).


235. Agency officials did say that "special or unique conditions" would be considered later in negotiating the actual purchase price, but not in benefit-cost analysis to determine the project's economic feasibility. Letter from R.M. Peach, Deputy Chicago Dist. Engineer, to Bruce Hannon, Sept. 5, 1968.


237. See Krutilla, supra note 212, at 779-81.]
Various suggestions for assigning dollar figures to the recreational, educational and scientific values of important natural areas have been made. The Corps estimates the recreational value of a reservoir by assuming certain unit values per visitor day, e.g., 50 cents for hiking and $1.00 for boating, then multiplying them by the numbers of individuals expected to engage in such activities during the life of the project.\(^{238}\)

Although this method is subject to criticism,\(^{239}\) so long as the Corps employs it to evaluate recreational benefits, the Corps also should use it to estimate costs incurred in destroying recreational resources, rather than simply classifying such costs as intangible and ignoring them. Similar techniques have been proposed for translating educational and research values of natural areas into monetary terms.\(^{240}\)

Aside from trying to reduce environmental values to dollars, other kinds of quantitative criteria are being devised for judging the significance of particular natural areas and understanding the trade-offs between preservation and development. Examples include a "uniqueness ratio"\(^{241}\) and a "weighted parameter" system.\(^{242}\) Each utilizes a scale of neutral units to depict the degree of scenic beauty, biological diversity, archaeological significance, freedom from pollution and other human interference, and other attributes of a natural area. The result is a chart showing the area's exceptional and unexceptional aspects in comparison with other areas of the same general type.

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239. E.g., Fox & Herfindahl, supra note 201, at 206. See text accompanying notes 250-254 infra.

240. A similar technique could be used to estimate the educational value of a natural area. One economist estimated such value for a unique Georgia river swamp by taking the average public expenditure per pupil-day in the state and multiplying it by the average daily attendance at all elementary and secondary schools within a fifty-mile radius of the swamp. A similar calculation could determine an area's value to college students in the natural sciences. C. Wharton, The Southern River Swamp—A Multiple-Use Environment, May 1970, at 10-14 (pub. by Bureau of Business and Econ. Research, School of Business Admin. Georgia State Univ., Atlanta).

With respect to an area's value for scientific research, the University of Illinois suggested several possible techniques for estimating the monetary value of the Allerton forests: (a) comparing the cost of new laboratory buildings, fully equipped with climate-controlled rooms, greenhouses, etc.; (b) calculating the cost of purchasing and restoring to the extent possible an equivalent area elsewhere along the Sangamon River; or (c) determining the total investment and the value of research conducted in the park, deriving the yield per acre. Corps of Engineers, Study of Alternatives, supra note 86, at 10.


The Corps has not used such a system. The Water Resources Council's proposed planning standards call for a "descriptive-qualitative interpretation" of all natural areas affected by a project and an evaluation of its effects. However, the standards lack a requirement of quantification beyond the number of acres or river miles involved.

3. Overestimation of Flood Control Benefits

Flood control benefits claimed for proposed reservoirs often are too high, particularly where the benefit-cost ratio of the project or the flood-control purpose is marginal. With respect to benefits in the form of damages prevented to existing development, particularly crops, the Corps often claims too many dollars per acre for too many acres. In the case of the recently constructed Carlyle project on the Kaskaskia River in Illinois, large benefits were alleged for protection of downstream farmlands. When the reservoir became operational, however, crop damages downstream actually increased because prolonged releases in the spring prevented fields from draining until it was too late to plant. Subsequently, when the Corps reduced the flood release rate, large losses, unanticipated when the project was designed, occurred upstream.

Moreover, the Corps claims increasing benefits for enhancement of the value of undeveloped land and protection of prospective development. The claimed benefits of flood control thus shift from the protection of established property to the more speculative underwriting of new development. Hence, projects are planned which not only create windfalls for landowners not presently suffering flood damages, but also encourage development of flood-prone areas, even though the projects are not engineered to prevent damage from infrequent but potentially disastrous floods. As development occurs, the reservoirs collect silt and lose their flood storage capacity. This pattern has produced a demand for more protective structures and has increased rather than decreased national flood losses.

4. Arbitrary Assumption of Other Monetary Benefits

Senate Document 97 includes among "tangible" benefits those which can be expressed in monetary terms based on "simulated market prices" or on "the cost of the alternative means that would most

244. See note 77 supra.
likely be utilized to provide equivalent products or services.”

The Corps frequently has relied upon this language to justify projects, largely by arbitrarily assigning values to recreation, water quality control and water supply benefits.

The Corps’ assumption of market values for recreation benefits already has been mentioned. It has been criticized because no statistical or other bases are revealed for the unit values selected in each case and because the same values are applied in very different situations, e.g., both to highly polluted and to relatively unpolluted reservoirs. Past population trends, now outdated and inaccurate, are used to estimate the number of persons likely to engage in the various activities during the project’s life. New standards proposed by the Water Resources Council offer no reform in benefit assessment procedures except substantial increases in the assumed visitor-day values.

Estimated benefits regarding water quality or water supply storage in a multiple-purpose reservoir usually are obtained by assuming them to be equal to the cost of their provision through construction and operation of a single-purpose reservoir. Since a single-purpose reservoir affords no opportunity for allocating joint costs among several purposes, this method inevitably produces a benefit-cost ratio greater than unity for any given purpose. It also arbitrarily assumes that single-purpose reservoirs are reasonable alternatives which would be undertaken if the multiple-purpose project were not built. In many cases this assumption is false. Single-purpose reservoirs are rarely built precisely because they usually are economically unjustifiable and no governmental unit is willing to pay for them.

The proposed standards, like Senate Document 97, do not expressly mention single-purpose reservoirs in authorizing use of the “most likely” alternative cost method of estimating benefits. After noting that the method “will generally mistate [sic] the total value of the output of a plan” and that it “must be used cautiously,” the Water Resources Council states that the method nevertheless may be applied if others

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248. S. Doc. No. 97, supra note 20, at 8.  
249. Fox & Herfindahl, supra note 201, at 203-04.  
250. See text accompanying note 238 supra.  
251. See Fox & Herfindahl, supra note 201, at 203.  
252. See note 359 infra. In December 1972 the U.S. Census Bureau lowered its projections of the nation’s population in the year 2000 to between 251 and 300 million. The prior estimate had been between 271 and 322 million. Actual population at the end of 1972 was 209.3 million. N.Y. Times, Dec. 18, 1972, at 1, col. 1. Compare the higher projections in Proposed Principles and Standards, 36 Fed. Reg. at 24165.  
254. See text accompanying note 227 supra and notes 377 et seq. infra.  
255. Proposed Principles and Standards, 36 Fed. Reg. at 24154; S. Doc. No. 97, supra note 20, at 8-10. Illustrations in the proposed standards refer to recycling of existing water supplies, use of groundwater, etc.
cannot be used and if the alternative is a "real alternative that could and would likely be undertaken" in the absence of the proposed program.\footnote{256} It is difficult to predict whether such language, by itself, will be sufficient to alter the Corps' current overreliance on the single-purpose reservoir alternative. More important, however, is its likely effect in conjunction with the National Environmental Policy Act of 1969 (NEPA). If courts continue under that Act to review the merits of agency proposals which would adversely affect the environment,\footnote{257} the language of the proposed standards probably will be taken seriously by judges and thus, eventually, by the Corps.

5. \textit{Low Discount Rates}

The costs of reservoir projects largely are initial costs for land acquisition and construction, all of which must be incurred before any benefits can be realized. Benefits, on the other hand, are distributed throughout the planned life of the project, the greater portion to be realized in later years due to anticipated increases in population and hence in beneficiaries. This is particularly true for purposes such as recreation and water supply. Thus a project's economic analysis must convert costs and benefits to a common time basis by using an annual rate of interest to discount future benefits and determine their present value.\footnote{258}

Because reservoir projects are capital-intensive and have long economic lives, choice of a discount rate is crucial in determining project feasibility. A low discount rate will cause more projects to be found feasible than one only a few percentage points higher.\footnote{259}

\begin{tabular}{|c|c|c|c|c|c|}
\hline
\textbf{Benefit to Accrue} & \textbf{3\%} & \textbf{5\%} & \textbf{8\%} & \textbf{10\%} & \textbf{12\%} & \textbf{15\%} \\
\hline
50 years hence & 23.0 & 8.0 & 2.0 & 0.90 & 0.40 & 0.09 \\
75 years hence & 11.0 & 2.6 & 0.3 & 0.08 & 0.02 & 0.01 \\
\hline
\end{tabular}

(Source: National Water Comm'n, \textit{supra} note 2, at 10-45.)

In 1971, using a discount rate of 34\% percent, the Corps claimed a benefit-cost ratio of 1.15 for the Oakley Modified Project. \textit{Recommended Development, supra} note 113, at C-25. A rate of 4 percent would have reduced the ratio to 0.97, and a 6 percent rate would have yielded only 0.65. \textit{See BATTLE \textit{FOR THE SANGAMON, supra} note 32, at 69. Compare Haveman, \textit{supra} note 215, at 108-13.}
Senate Document 97 originally provided that the discount rate for evaluating proposed federal water projects should be based on the average rate of interest payable by the Treasury (the "coupon rate") on United States bonds outstanding at the end of the preceding fiscal year which, when they were issued, had terms to maturity of 15 years or more. In a period of generally rising interest rates this produced a discount rate well below the effective rate which the federal government had to pay to borrow new money. The Water Resources Council amended Senate Document 97 in 1968 to base the discount rate on the average market "yield rate" (the average of daily bid prices) during the preceding fiscal year on bonds having terms of 15 years or more when the computation is made. This change immediately raised the discount rate for the remainder of fiscal year 1969 from 3 3/4 percent to 4 5/8 percent.

Economists have disputed whether the discount rate for federal water projects should equal the average rate of return on private investments (the "opportunity cost" of capital) or be set at some lesser figure as a means of achieving regional income redistribution through subsidy of water projects. However, there is widespread agreement that from an efficiency standpoint the rate should be more comparable with private rates than that used to date. A low discount rate can be an inefficient, environmentally destructive device for implementing a subsidy policy, since it tends to distort the allocation of resources toward overdevelopment. Because a low rate biases the design of projects toward components with higher near-term costs and lower near-term benefits, it legitimates not only more projects but also larger ones with more purposes.

260. S. Doc. No. 97, supra note 20, at 12.  
262. The regulation still is in effect, and in fiscal year 1973 the applicable rate is 5 1/2 percent. See 3 ENV. RPTR.-CURR. DEV. 372 (1972).  
264. Fox & Herfindahl, supra note 201, at 202. The Water Resources Council's proposed standards estimate the real rate of return on nonfederal investments to be 10 percent, but recommend a discount rate of 7 percent for the next five years as a means of "[r]ecognizing both the objective of subsidizing water resource projects and the objective of an efficient combination among and between Federal and non-Federal investment activities." Proposed Principles and Standards, 36 Fed. Reg. at 24167. The Council points out that, properly calculated, the cost of federal borrowing includes not only the yield rate on Treasury obligations but also tax revenues foregone on returns to private borrowing displaced by federal borrowing, commissions paid on sales of bonds, and administrative costs of borrowing, and that the cost thus calculated is at least 7 percent and perhaps as high as 10 percent. Id.  
265. O. Eckstein, supra note 214, at 100; National Water Comm'n, supra note 2, at 10-44. Nevertheless, the Commission apparently will recommend that the current
The Water Resources Council's recent suggestion of a seven percent discount rate has not been well received in Congress. It is feared that such a rate would disrupt water resources development, since economic justification would be more difficult to establish. As a result there was attached to the Flood Control Act of 1972 a provision that Senate Document 97 and the interest rate formula amendment by the Water Resources Council in December 1968 "shall remain in effect until December 31, 1973, unless changed prior to that date by an Act of Congress." Primarily motivated by this provision, President Nixon, whose OMB had urged a ten percent discount rate, vetoed the entire act in October 1972. It was reintroduced and passed by the Senate early in 1973.

6. Outdated Discount Rates for Older Projects

Another aspect of the discount rate problem is the practice of using lower rates for older projects than that applied to those recently proposed or authorized. As soon as Congress appropriates any funds which may be used to acquire land for a particular project, the Corps, even if it does not acquire land that year, freezes the discount rate at the rate then in effect, which thereafter is used for the project. The Water Resources Council's 1968 discount rate regulation reinforced this practice by assuring local sponsors of authorized, but unconstructed, projects that if they committed themselves by December 31, 1969, to pay their cost shares, their projects would not be reevaluated.

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266. See Note 264 supra; Sierra Club v. Froehlke, — F. Supp. —, 5 ERC 1033, 1092 (S.D. Tex. 1973), and congressional committee reports therein cited.
271. E.g., although the rate for projects proposed for Congressional authorization in fiscal 1973 is 5½ percent, the rate currently used to evaluate the Oakley project is only 3¼ percent. The Corps has explained this discrepancy as follows:

The interest rate for Oakley Reservoir and Channel Improvement was determined by long-standing Department of the Army criteria, under which the interest rate for an authorized project is fixed at the rate in effect at the time of and used in the preparation of the justification analysis presented . . . in support of the initial appropriation of construction funds.

Congress first appropriated advance land acquisition funds for the Oakley project in Fiscal Year 1968. The interest rate in effect and used for jus-
ated under the new, more realistic rate.\textsuperscript{272} This provision evidenced a reluctance to disappoint local hopes and a disregard for the efficiency which the new regulation was to promote.

A more logical policy would freeze the discount rate only when extensive clearing, excavating or dam-building has begun, or at least not before major contractual commitments have been made. At that point the government could be deemed committed to the project, and little would be gained by thereafter modifying the method of analysis to find the project unjustified. However, present policy treats an appropriation of funds, however small, which the Corps in its discretion may use for either advanced planning or purchase of land, as a binding commitment, never again to conduct a full evaluation of the project, no matter how inefficient it may later appear.\textsuperscript{273}

The only apparent basis for fixing the rate at the time of first appropriation for land acquisition is a desire to end controversy and let the Corps and prospective beneficiaries breathe easily. In view of federal budgetary constraints, keen competition for funds among other social welfare programs, and the enormous backlog of authorized and expensive reservoir projects, this rationale is unconvincing. In fairness to the taxpayers and to prospective beneficiaries of subsequently proposed water resources projects and of other federal programs, all reservoir projects to which the government is not irretrievably committed should be evaluated according to common standards.

While the Council has proposed that its new standards, including the seven percent discount rate, generally not apply to projects author-

\textsuperscript{272} Federal policy considers advance land acquisition to be a construction phase.

Letter from Robert E. Jordan, III, Special Ass't to the Secretary of the Army, to Bruce Hannon, June 29, 1970. The Corps reiterated this position in Senate hearings in 1970 and added: "The appropriations committees appear to acknowledge this classification by initially and subsequently listing project funds for land acquisition in their reports under the construction rather than under the advance design phase of project status." \textit{Hearings on H.R. 18127, supra note 131, pt. 1, at 101}. $1 million allocated to "Oakley Lake and channel improvements (land acquisition)" appears in the "Construction" column rather than the "Planning" column in the conference report on public works appropriations for fiscal 1973. \textit{H.R. REP. No. 92-1310, 92d Cong., 2d Sess. 13 (1972)}.

\textsuperscript{273} This provision probably covered some projects for which Congress had appropriated no land acquisition funds prior to December 31, 1969, since the regulation does not mention appropriations as a relevant factor.

It was also argued that such an appropriation was made for the Oakley project in fiscal 1968 and in each fiscal year since. However, only one small tract of farm land has been purchased to date. Most appropriations remain unspent, and those that have been expended have gone to plan a project very different from the one which the Corps originally proposed and for which Congress appropriated funds in fiscal years 1968 and 1969. The single piece of land acquired could easily be sold, probably at a profit. There has been no irretrievable commitment to any Oakley project.
ized or submitted for Congressional approval by the effective date of the standards, it would apply them to projects on which “actual construction or other similar activity” had not commenced within five years of congressional authorization. This would subject many previously authorized projects to updated analysis, particularly if the phrase “actual construction or similar activity” does not include mere land acquisition. In most projects clearing, excavation or other construction activity does not begin within five years after authorization, as evidenced by the many currently inactive projects authorized ten or 20 years ago.

C. Judicial Review of Corps Planning

For 30 years the federal courts consistently refused to review the adequacy of the Corps of Engineers’ planning of reservoir projects. Claims that the agency had failed to consider or select alternative means of achieving particular purposes or that a project’s costs would exceed its benefits were dismissed on the ground that such determinations were a legislative function and should be left to Congress. The provision in the Flood Control Act of 1936 that the federal government should participate in flood control activities only “if the benefits to whomsoever they accrue are in excess of the estimated costs” was held to be a “declaration of policy [which] does not constitute a limitation upon the specific authorization” of individual projects. Recently, however, as will be shown below, courts have become increasingly receptive to allegations of inadequate planning by the Corps and other federal agencies, and have demonstrated a willingness to enjoin public works projects where planning deficiencies are shown.

1. Compliance with NEPA

This new attitude primarily stems from passage of the National Environmental Policy Act of 1969 (NEPA). Section 101(b) of NEPA recognizes a continuing Federal responsibility to use “all practical means” to improve and coordinate governmental programs in order to attain the widest range of beneficial uses of the environment and

maintain environmental diversity.\textsuperscript{276} Section 102(2) directs that "to the fullest extent possible" all federal agencies shall, \textit{inter alia}, (a) utilize a systematic, interdisciplinary approach involving use of the natural and social sciences and the environmental design arts in planning and decisionmaking which may affect the environment; (b) develop methods and procedures to insure that presently unquantified environmental values will be given appropriate consideration along with economic and technical factors; (c) include a detailed environmental impact statement in every proposal for major federal action significantly affecting the quality of the environment; and (d) consider and develop alternatives to any proposal involving unresolved conflicts over the use of resources.\textsuperscript{280}

Of the issues which have emerged in litigation under NEPA, three will be discussed in this Article: adequacy of the environmental impact statement; agency bias in consideration of environmental factors; and judicial review of substantive agency decisions.\textsuperscript{281}

\textbf{a. Adequacy of Environmental Impact Statement}

At the very least, NEPA is an environmental full-disclosure law.\textsuperscript{282} In planning a reservoir project the Corps is required to prepare a detailed statement which will alert reviewing agencies, the President, Congress and the public to "all known possible environmental consequences" of proposed agency action, including possible impacts brought to the Corps' attention by critics and other concerned persons.\textsuperscript{283} The statement must discuss alternative methods of achieving the goals of the proposed action and the environmental consequences of the various alternatives, including abandonment of the project.\textsuperscript{284} Thus the impact statement is to provide "a basis for (a) evaluation of the [project's] benefits \ldots in light of its environmental risks, and (b) comparison of the net balance \ldots with the environmental risks presented by alternative courses of action."\textsuperscript{285} While only reasonably available alternatives need be subjected to a "rigorous exploration and objective evaluation,"\textsuperscript{286} such alternatives are \textit{not} limited to those which can be adopted

\begin{footnotes}
\item[279.] 42 U.S.C. § 4331(b) (1970).
\item[281.] For a detailed discussion of the latter two points, see Comment, \textit{Substantive Review under the National Environmental Policy Act: EDF v. Corps of Engineers}, 3 Ecology L.Q. ---.
\item[283.] \textit{Id}.
\item[284.] NRDC v. Morton, 458 F.2d 827, 833, 3 ERC 1558, 1561 (D.C. Cir. 1972);
\item[285.] NRDC v. Morton, 458 F.2d 827, 833, 3 ERC 1558, 1561 (D.C. Cir. 1972).
\item[286.] \textit{Id}. at 833 n.12, 834, 3 ERC at 1561 n.12, quoting from Council on Environ-
\end{footnotes}
and effected by the official or agency issuing the statement or those which offer a complete solution to the problem.\textsuperscript{287}

Because a basic function of the environmental impact statement for a Corps reservoir project is to permit comparison of benefits with possible adverse environmental effects, the statement should discuss the economic benefits claimed by the agency and should respond to opponents' criticisms of the Corps' benefit-cost analysis.\textsuperscript{288}

\textbf{b. Agency Bias in Considering Environmental Factors}

An additional procedural requirement of NEPA is that the agency engage in "individualized consideration and balancing of environmental factors—conducted fully and in good faith."\textsuperscript{289} Section 102(2)(B) expressly directs that environmental values be given "appropriate consideration in decisionmaking" along with economic and technical considerations.\textsuperscript{290} Thus a mere mechanical compliance with procedural requirements will not satisfy the Act if it does not amount to full good faith \textit{consideration} of the environment.\textsuperscript{291} While the courts have not gone so far as to require that agency officials be "subjectively impartial" in their weighing of environmental factors, good faith objectivity must be shown.\textsuperscript{292} An environmental impact statement which engages in

\begin{footnotesize}
\begin{itemize}
    \item \textsuperscript{289} Calvert Cliffs' Coordinating Comm., Inc. v. AEC, 449 F.2d 1109, 1115, 2 ERC 1779, 1783 (D.C. Cir. 1971).
    \item \textsuperscript{290} 42 U.S.C. § 4332(2)(B) (1970).
    \item \textsuperscript{291} Calvert Cliffs' Coordinating Comm., Inc. v. AEC, 449 F.2d 1109, 1115 n.5, 2 ERC 1779, 1783 n.5 (D.C. Cir. 1971). \textit{See also} EDF v. Corps of Engineers, 470 F.2d 289, 4 ERC 1721 (8th Cir. 1972).
\end{itemize}
\end{footnotesize}
rationalizations or salesmanship in support of the project, or gives short
shrift to plausible arguments by opponents may be evidence of imper-
missible bias in the agency's consideration of environmental values.\textsuperscript{293}

c. Reasonableness of Substantive Agency Decisions

The question whether NEPA creates judicially enforceable sub-
stantive, as well as procedural, rights has been the subject of judicial
controversy and may have to be resolved by the Supreme Court.\textsuperscript{294}
However, the better reasoned decisions have concluded that the Act au-
thorizes limited judicial review of the merits of agency decisions to de-
termine whether, according to the substantive criteria set forth in sec-
tions 101(b) and 102(a), "the actual balance of costs and benefits
that was struck was arbitrary or clearly gave insufficient weight to en-
vironmental values."\textsuperscript{295} This view is shared by the Council on Environ-
mental Quality.\textsuperscript{296}

Once it is established that agency decisions are reviewable on their
merits under NEPA, courts must consider alleged deficiencies in the
Corps' benefit-cost analysis of specific projects.\textsuperscript{297} Only by rigorously
examining the claimed economic benefits and costs can it be deter-
mined whether the final agency decision to proceed with a project was
arbitrary or failed to accord sufficient weight to threatened environ-
mental values.

The outstanding example to date of such a review is \textit{Sierra Club
v. Froehlke}, concerning the Wallisville reservoir in Texas.\textsuperscript{298} Noting
NEPA's mandate that all federal agencies develop procedures to insure
that "presently unquantified" environmental values be given appropriate

\begin{itemize}
\item \textsuperscript{293} Sierra Club v. Froehlke, — F. Supp. —, 5 ERC 1033, 1067 (S.D. Tex.
  1973).
\item \textsuperscript{294} Conservation Council v. Froehlke, 473 F.2d 664, 665, 4 ERC 2039, 2040
  (4th Cir. 1973); EDF v. Corps of Engineers, 470 F.2d 289, 297, 4 ERC 1721, 1725-28
  (8th Cir. 1972); Sierra Club v. Froehlke, — F. Supp. —, 5 ERC 1033, 1065-66
\item \textsuperscript{295} EDF v. Corps of Engineers, 470 F.2d 289, 300, 4 ERC 1721, 1728 (8th Cir.
  1972), quoting from Calvert Cliffs' Coordinating Comm., Inc. v. AEC, 449 F.2d 1109,
  1115, 2 ERC 1779, 1783 (D.C. Cir. 1971). \textit{Compare} Citizens to Preserve Overton Park,
  Inc. v. Volpe, 401 U.S. 402, 416, 2 ERC 1250, 1256 (1971); Sierra Club v. Froehlke,
  Froehlke}, 473 F.2d 346, 352-55, 4 ERC 1829, 1833-34 (8th Cir. 1972), the Corps of
  Engineers conceded that a limited review on the merits generally is available, but
  claimed that this was not so where Congress appropriated funds for the project after
  an adequate environmental impact statement had been filed. The court disagreed,
  stating that an appropriation act should not be read to imply changes in the substan-
  tive provisions of NEPA.
\item \textsuperscript{296} \textit{COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY 253-55 (3rd
\item \textsuperscript{297} EDF v. Froehlke, 473 F.2d 346, 356, 4 ERC 1829, 1836 (8th Cir. 1972).
\item \textsuperscript{298} — F. Supp. —, 5 ERC 1033 (S.D. Tex. 1973).
\end{itemize}
consideration in decisionmaking, the court closely scrutinized the quantitative analysis. It found that although the Corps consistently maximized benefits by including dollar values for all environmental values to be created by the project, no corresponding effort was made to include among costs any estimation of the environmental values which would be destroyed. Construction of the project was enjoined pending preparation of a new impact statement giving adequate attention to environmental factors.

2. Compliance with Legislation Authorizing the Project

Congress typically authorizes a Corps reservoir project by a single sentence in a flood control act stating that the named project "is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in [the survey report and accompanying documents] at an estimated cost of [the amount estimated in the report]." The annual appropriation for flood control projects in advanced planning and construction stages is subject to the express condition that "no part of this appropriation shall be used for projects not authorized by law." The tendency of the Corps to modify and expand projects during the advanced planning stage has been noted previously. Congressional policy forbids authorization of project modifications without submission of a report by the Chief of Engineers. However, in any case where the total authorization for a project is not sufficient to complete plans that may have been made the Chief of Engineers is authorized in his discretion to modify the plan so that such dam or work will be smaller than originally planned with a view to completing a useful improvement within an authorization.

Only one court has held that the Corps' expansion of a reservoir project during advanced planning was so great as to be unlawful in the absence of further authorization from Congress. In that case, even

303. See text accompanying note 231 supra.
306. United States v. 2,606.84 Acres of Land, 309 F. Supp. 887, 898 (N.D. Tex. 1969), rev'd, 432 F.2d 1286 (5th Cir. 1970). In a case involving a Corps' navigation project, Ryan v. Chicago, B. & Q. R.R., 59 F.2d 137 (7th Cir. 1932), the district court had enjoined construction of a larger, more permanent dam and lock than Congress previously had authorized. The Court of Appeals ordered the injunc-
though changes in the plans tripled the capacity of the joint-use pool,
doubled that of the flood control pool, and relocated the dam four
miles upstream, the decision was reversed. Holding that the modifica-
tions did not exceed the Corps’ authority, the Fifth Circuit quoted
from the Chief of Engineers’ original report to Congress. That report
had recommended the project “generally in accordance” with the
district engineer’s report “as modified herein, and with such future
modifications thereof as in the discretion of the Secretary of War and
the Chief of Engineers may be advisable.”307 Similar language is in-
cluded in most Corps reports to Congress recommending project au-
thorizations. The court of appeals stated:

It has long been the custom of Congress to approve projects of
this nature on the basis of such preliminary plans and to authorize
the Chief of Engineers to make such modifications as later studies
indicate are necessary. . . .

Mere changes in the plans and specifications of the Dam and
Reservoir did not render arbitrary and capricious the discretion exer-
cised by the Secretary of the Army and the Chief of Engineers. . . .
Nor did such changes render their actions without authority. In pro-
jects of this sort there is a built-in margin for error, leaving room for
necessary changes.308

Another district court recently dismissed for failure to state a cause of
action a portion of a complaint alleging the Corps was exceeding its
authority by building a project substantially different from that de-
scribed in its survey report to Congress. In the court’s view, “[I]t is the
sole prerogative of the Congress . . . to determine if the project is pro-
ceeding in accordance with its authorization, and, if not, to determine
what, if anything, it wishes to do about it.”309

This position is too extreme. It gives the Corps unlimited discre-
tion, even to make changes of which Congress is unaware. Moreover,
it is inconsistent with a later court of appeals decision recognizing
the propriety of a trial to determine whether the Corps’ redesign ex-
cceeded its authority. The appeals court remarked that Congress had

307. United States v. 2,606.84 Acres of Land, 432 F.2d 1286, 1292 (5th Cir.
1970).

308. In general agreement with the proposition that the Chief of Engineers has
considerable discretion to adjust plans originally recommended to and approved by
Congress are Allison v. Froehlke, 470 F.2d 1123, 4 ERC 1901 (5th Cir. 1972);
United States v. Bowman, 367 F.2d 768 (7th Cir. 1966); Ryan v. Chicago, B. & Q.
R.R., 59 F.2d 137 (7th Cir. 1932); Sierra Club v. Froehlke, 345 F. Supp. 440, 446
(W.D. Wis. 1972).

309. EDF v. Corps of Engineers, 325 F. Supp. 749, 754-55, 2 ERC 1260, 1264
(E.D. Ark. 1971).
authorized the project "substantially in accordance with the recommenda-
tions of the Chief of Engineers," and stated: "[T]he key word and is-
sue would appear to be 'substantially'." 310

At such a trial the Chief of Engineers might claim that the ap-
propriation of construction funds amounted to ratification of changes
previously reported to Congress. Courts have been reluctant to hold
that appropriation acts can affect prior substantive legislation, especially
when the language of the appropriation act is general, as in flood con-
roll projects. 311 Furthermore, the applicable statute 312 appears to con-
template specific statutory authorization of substantial modifications
after they have been reported to Congress; such supplemental authori-
zations frequently are included in the flood control acts. 313

Modification of a project to add storage for streamflow regulation
represents a special case. A 1961 amendment to the Federal Water
Pollution Control Act provided that in the "survey or planning" of fed-
eral reservoirs, "consideration shall be given" to inclusion of storage for
regulation of streamflow for the purpose of water quality control. 314
The need for and value of such storage were to be determined by the
constructing agency with the advice of the Secretary of HEW, whose
views were to be set forth in any report to Congress "proposing au-
thorization or construction" of any reservoir including such storage. 315
Construing "survey" to refer to preauthorization planning and "plan-
ning" to mean post-authorization planning, the Corps viewed this stat-
ute as general authority "for modification of authorized reservoirs for
this purpose during the planning period, including the period of project
construction where planning is still in progress," subject only to the
condition that Congress be informed of the intention to modify the
project by letters to the Public Works and Appropriations Commit-
tees. 316 As the Oakley project demonstrates, the Corps considers this
blanket authority applicable to projects authorized after, as well as be-
fore, the effective date of the 1961 amendment.

310. Allison v. Froehlke, 470 F.2d 1123, 1125, 4 ERC 1901, 1903 (5th Cir.
1972).

311. EDF v. Froehlke, 473 F.2d 346, 355, 4 ERC 1829, 1833-34 (8th Cir.
1972); Federation of Civic Ass'ns, Inc. v. Airis, 391 F.2d 478, 482 (D.C. Cir. 1968).

312. 33 U.S.C. § 701b-8 (1970): "No project or any modification not author-
ized, of a project for flood control ... shall be authorized by the Congress unless a
report for such project or modification has been previously submitted by the Chief of
Engineers."

739, 740.


315. Id.

The Federal Water Pollution Control Act Amendments of 1972 expand the purposes for which storage for regulation of streamflow may be included in federal reservoirs. Not only water quality but also navigation, salt water intrusion, recreation, aesthetics, and fish and wildlife purposes may be considered during “the survey or planning” of a reservoir.\textsuperscript{317} Presumably the Corps construes the 1972 Act simply as a broader license for post-authorization change not requiring Congressional approval other than subsequent appropriation of construction funds.

Congress’ use of the phrases “survey or planning” and “authorization or construction” and its apparent acquiescence in the Corps’ construction of the 1961 Act support the view that for some previously authorized projects no further specific authorization is required for the addition of storage for regulation of streamflow. However, limits to this general authority must exist. Streamflow regulation for some purposes can require enormous storage capacities. If in a particular case addition of this function would increase greatly the size and cost of the project and cause serious adverse effects to persons and interests not affected by the original plan, the law should be construed to permit such a modification only with specific statutory authorization after further public hearings by the Public Works Committees. A reasonable judicial solution would be to require that where storage for streamflow regulation is added to a reservoir, the modified project still must be “substantially in accordance” with the plan originally proposed. If modifications become so gross as to result in a substantially different project, it should be evaluated by Congress in the same manner as new projects.

III

DEFICIENCIES IN FORMULATION AND EVALUATION OF THE OAKLEY PROJECT

In this section past and present plans for the Oakley project are analyzed more closely. Primary attention is focused on feasibility of alternatives, problems of economic evaluation, and legal issues. The intent is not only to illuminate deficiencies in the planning of Oakley but also to outline a method of analysis for detecting weaknesses in other Corps projects.

A. Flood Control

1. Estimated Benefits

The Corps has estimated the average annual area flooded along the

\textsuperscript{317} Pub. L. No. 92-500, § 102(b), 86 Stat. 816. The constructing agency makes the final determination whether storage shall be added for such purposes, except in the case of water quality, where the Administrator of the Environmental Protection Agency makes the decision.
131 miles of the Sangamon River below Lake Decatur to be 27,000 acres.\(^{318}\) Of these, 7,600 acres, stretching 33 miles along the Sangamon from its junction with Salt Creek (a major tributary) to its mouth, would receive virtually no protection from proposed flood control measures.\(^{319}\) Of the 19,400 acres flooded above Salt Creek, most crop damage occurs on only 6,700 acres.\(^{320}\)

The Corps estimated that the Oakley project recommended in 1962 would, in the average year, prevent flooding on 12,400 acres above Salt Creek.\(^{321}\) To accomplish that result the Corps proposed to acquire for the Oakley flood control pool (above the elevation of the joint-use pool) fee interests in 4,300 acres and flowage easements in 4,000 acres and to channelize the Sangamon down to Salt Creek.\(^{322}\) For movement of equipment and deposit of spoil on the banks, channelization would require easements on 4,700 of the 12,400 acres on which flooding was to be prevented. Thus, fewer than 8,000 acres could be said to benefit from the protection.\(^{323}\)

The Modified Project now is intended to "protect" 16,900 acres, of which 11,700 would be purchased for the greenbelt and still be flooded.\(^{324}\) To protect the other 5,200 acres, the Corps proposes to take out of production 5,500 acres upstream\(^{325}\) and to reduce the value of still another 3,500 acres by subjecting them to artificial pe-

\(^{318}\) Recommended Development, supra note 113, Table C-2 and Plates F-15 through F-17. The total includes lands flooded one or more times during the year, regardless of frequency or duration.

\(^{319}\) Recommended Development, Tables C-2, C-9; H.R. Doc. No. 472, supra note 5, Table A-33.

\(^{320}\) Recommended Development, Table C-2. Of the other 12,700 acres flooded annually between Lake Decatur and Salt Creek, 9,000 are forested; most of the rest are out of production under the federal government's "idle acres" program to reduce agricultural surpluses. Bruce Hannon, Comm. on Allerton Park (based on study of aerial photographs). In 1970 the Corps calculated average annual flood damages on these 19,400 acres to be $967,000, including $440,000 in crop losses, $216,000 in lost wages and profits due to interruptions in transportation and other business activity, and $134,000 in damages to farm property. Recommended Development, Table C-1. So far as is known, Sangamon flooding has resulted in no loss of life.


\(^{322}\) See Corps of Engineers, Chicago Dist., Summary of Oakley Reservoir and Channel Improvement Project, Sangamon River, Ill., Jan. 1968, at 5, 24 [hereinafter cited as Oakley Summary].

\(^{323}\) Waterways Alternative, supra note 102, at 14. Normally crop losses occurred on only half of these 8,000 acres. See text accompanying note 320 supra.

\(^{324}\) Recommended Development, Tables C-2, C-9, Plates F-16, F-17.

\(^{325}\) These acres would be acquired in fee for the flood control pools above the joint-use pools of the two reservoirs. Of this land, the 1,100 acres along Friends Creek have an average per acre value of $650, rather than the average $400 per acre value of the land to be protected. Corps of Engineers, Chicago Dist., Fact Sheet, Oakley Project-Acreage Discussion, March 8, 1971.
When one considers the price that must be paid in permanent or periodic loss of use of upstream lands, that complete crop losses occur once in 20 years on the 5,200 acres on which flooding is to be prevented, and that the net return per dollar invested in those lands is at least as high as the return on land in the same area which is not subject to flooding, one is likely to view skeptically the asserted “need” for a flood control reservoir.

Throughout the planning of Oakley, the Corps’ estimated benefit-cost ratio for the flood control purpose has remained remarkably constant and marginal. For the 1962 project the ratio was 1.01; for the 1966 plan, 1.02; and for the Modified Project, exactly 1 to 1. Thus, if as little as one or two percent of the economic benefits claimed for flood control cannot be substantiated, the flood-control purpose is unjustified.

The most obvious error in evaluation of such benefits for the Modified Project relates to the greenbelt, from which the Corps claims average annual benefits of $225,000 for flood control. This figure, more than 18 percent of the total annual flood control benefits claimed, represents the average annual flood damages which occur under present conditions on land which would be acquired for the greenbelt and thereafter used only for a floodway and recreation. However, the conversion of farmed bottomland to unfarmed greenbelt cannot properly be said to produce positive benefits in the form of reduced flood losses, since society will have lost the net value of crops now produced on the land.

Also questionable is the $230,000 per year, nearly 20 percent of total flood control benefits, estimated to result from withholding sediment from Lake Decatur. The benefits claimed are for continued recreational use of Lake Decatur, maintenance of water supply capacity, and maintenance of high residential property values around the lake.

326. Id. These acres are needed for flowage easements and include 1,100 acres in Allerton Park.

327. Information obtained from A.C. Kamm, Piatt County agricultural agent, and John Goodell, a registered professional engineer from Urbana experienced in farm drainage problems.


331. Recommended Development, Table C-22.

332. Id., at C-15. See BATTLE FOR THE SANGAMON, supra note 32, at 55.

333. BATTLE FOR THE SANGAMON, supra note 32, at 68.

334. Recommended Development, at C-16. In H.R. Doc. No. 472, supra note 5, at A-56, it was estimated that property values adjacent to Lake Decatur would decline by $118,000 per year if sedimentation was not stopped.
These benefits are difficult to justify because sedimentation in Lake Decatur is unrelated to flooding and because each acre-foot of storage saved there would be offset by one lost in Oakley. Eventually the value of the land around Oakley, from which large recreational benefits are claimed, also would decline. Furthermore, since water supply storage for Decatur is to be provided in Oakley as well as in Lake Decatur, no net gain would result from protecting an acre-foot in the old reservoir and losing an equal amount in the new one.

Finally, the claimed benefits per acre from protection of croplands are inflated. The Corps states that such lands presently sustain annual flood losses averaging more than $60 per acre and that the Modified Project would yield average annual benefits of $40 to $50 per acre. However, the University of Illinois College of Agriculture estimates that the total annual net income from such lands without any flood losses would be only $45 per acre. Hence, for the Corps' claims to be valid, the lands in question would now have to be operating at a net loss. This is not the case. Farmers report that they earn more money from their bottomlands than from the uplands. Thus, in light of the abovementioned factors, the real benefit-cost ratio of the flood control purpose of the Modified Project must be well below 1.0.

2. Alternatives

The Corps maintains that it studied alternative flood control measures before recommending authorization of the project in 1962. Reference to the 1961 survey report discloses that other solutions considered were single-purpose mainstream and tributary reservoirs; downstream lateral reservoirs; local protection projects consisting of improvements to existing levees, construction of new levees and flood-walls, interior drainage facilities, and channel improvements; evacuation of the floodplain; and floodplain zoning to restrict uses subject to damage. All were rejected primarily because of a need for reservoir storage for water supply. Non-reservoir alternatives also were rejected due to a need for "additional recreation areas and further enhancement of fish and wildlife," despite the fact that proposed channel improvements, alone, were expected to have such deleterious effects on fish and wildlife that the Corps had not claimed any net benefits in this regard. Lateral reservoirs, strongly recommended by the Department of the Interior for recreation and for fish and wildlife, were rejected not only

335. See note 320 and accompanying text supra.
338. Ingersoll, supra note 328.
because they would not supply Decatur with water but also because
downstream local interests had indicated a disinterest in paying their
required share of the costs. There was no indication that levees and
other local protection techniques would not provide an adequate and
economically feasible solution to flood problems.

Aside from the alternatives mentioned in the survey report, agricul-
tural experts have recognized a "need for widespread application of
soil and water conservation practices on the entire [upper Sangamon]
watershed." Conservation specialists of the University of Illinois and
the Soil Conservation Service have recommended construction of parallel
terraces with tile outlets on farms in the upper Sangamon Valley. The
terraces would hold water during heavy rains, preventing it from
rushing off with topsoil. Water is released gradually through the tiles,
leaving the soil behind. Some structures of this type already exist in
the watershed, and experts agree they are the best long-range conserva-
tion solution for the flat land of central Illinois.

Parallel terraces are planned and built by the Soil Conservation
Service (SCS). Until the recent termination of the Rural Environ-
mental Assistance Program, federal cost-sharing was available through
the Agricultural Stabilization and Conservation Service. Total costs
commonly are $100 to $125 per acre, and the SCS has estimated
that it would cost $10 million to treat the Sangamon basin above Lake
Decatur. Unless rural revenue sharing or other state or local funds
now can be used to pay part of the cost, many landowners will not be
motivated sufficiently to undertake construction of terraces. This is

340. Id.
341. Letter from R.C. Hay, Prof. of Agric. Engineering, Univ. of Illinois, to S.
Charles Kendeigh, June 3, 1971. The Corps and the U.S. Soil Conservation Service
acknowledge that proper conservation practices in the watershed above Decatur would
diminish greatly siltation and flooding while preserving the extraordinarily rich top
soil. However, these agencies assume that private owners will not act, and that per-
sons downstream therefore should be protected by reservoirs. Letter from Ferd E.
Anderson, Jr., to Sen. Allen J. Ellender, Senate Comm. on Appropriations, Sept. 11,
1968, at 2.
342. Walter Lembke, Prof. of Agric. Engineering; Donald McCandless, Parallel
Terraces Will Save You Soil, Prairie Farmer, Feb. 6, 1971. Harza Engineering also
343. Lembke and McCandless, supra note 342.
345. McCandless, supra note 342.
346. BATTLE FOR THE SANGAMON, supra note 32, at 72.
347. The solution might be enactment of state or federal law requiring adequate
soil and water conservation measures on cultivated lands or making such measures a
condition to the right to receive crop subsidy payments. In Pennsylvania recently
adopted regulations require a permit for all earthmoving activities except agricultural
plowing or tilling. The latter must be carried out in accordance with a plan filed
with the state after July 1, 1977. 4 CLEAN AIR AND WATER NEWS 693, Nov. 26, 1972.
unfortunate since, unlike the proposed flood control reservoirs, parallel terraces throughout the upper Sangamon valley would be an efficient investment. Aside from the great value of maintaining the productivity of watershed by holding topsoil, the average annual flood protection and water quality benefits would exceed substantially the amortized cost of constructing terraces.\textsuperscript{348}

Another means of dealing with sedimentation in Lake Decatur would be to dredge it. Although reclaiming the area already lost to silt could almost double present storage capacity, the Corps has not given the matter serious consideration. The city of Carlinville, Illinois dredges its reservoir, at a cost of 50 cents per cubic yard,\textsuperscript{349} and the Corps, itself, dredges at the mouth of the Sangamon for 80 cents per cubic yard.\textsuperscript{350} If the Corps is correct in its estimate that 120 acre-feet of sediment per year will be deposited in Lake Decatur without Oakley reservoir, 193,600 cubic yards would have to be removed annually to halt storage loss. At 80 cents per cubic yard, the cost would be $155,000 per year. Despite additional costs for acquiring land on which to settle the spoil, dredging is a feasible alternative if, as the Corps claims, maintenance of Lake Decatur's present capacity is worth $230,000 per year.\textsuperscript{351}

Finally, a more appropriate setting for floodplain zoning can scarcely be imagined. Urban flood damages are virtually nonexistent along the Sangamon, and damages to rural structures are slight. The main concern should be to prevent development which would increase future losses. Enactment of a comprehensive floodplain zoning law such as was prepared by the Ogilvie administration,\textsuperscript{352} should be an important element of flood control in the Sangamon valley.

\section*{B. Water Supply}

\subsection*{1. Need for Additional Supply}

Decatur's anticipated need for increased water supply to attract industry and promote economic growth has been the real basis of the

\textsuperscript{348} Economists for the Committee on Allerton Park have estimated the average annual cost of such structures throughout the upper valley to be $530,000. It is expected that they would withhold floods up to the five year frequency, reducing flood damages on the lower Sangamon by 50 percent, or about $730,000 annually. Letter from Bruce Hannon to Gov.-Elect Daniel Walker, Nov. 13, 1972. During the period when terraces are being built, farmers downstream could protect themselves with low-rate federal crop insurance. Letter from Michael J. O'Connell, supra note 77.


\textsuperscript{350} Recommended Development, supra note 113, at C-17.

\textsuperscript{351} See text accompanying note 334 supra.

political support which has prevented Oakley from dying on the drawing boards. For 20 years community leaders have viewed a federal reservoir on the Sangamon as the best means to provide additional water and protect the existing reservoir at the least cost to local users.

At present Decatur uses about 20 million gallons of water per day. Lake Decatur can supply 28 million gallons per day, even without the 5 million gallons available from two deep wells constructed in the Mahomet Valley aquifer in 1955 and since maintained in reserve, but never used. The Illinois Division of Waterways has estimated that Decatur will develop a 30 million gallon daily demand only after the year 2000. The Corps’ 1962 and 1966 plans provided for 11,000 acre-feet of water supply storage in Oakley reservoir, enough to permit a mean daily withdrawal of 21 million gallons from that source alone.

In its 1969 Waterways Alternative, the Division of Waterways predicted that Decatur’s total demand for water supply would be 58.3 million gallons per day by the year 2020, and calculated that 21,600 acre-feet of new storage would be required to satisfy that demand. The Division now concedes that its prediction relied on population projections which were far too high, and that the city’s net daily pumpage in 2020 is expected to be only 38.8 million gallons.

Furthermore, the Division apparently took no cognizance of the declining rate of industrial water use in Decatur. Due to decreases in such use by some large industries, and despite population growth, Decatur’s average daily pumpage has increased only slightly since 1951, and stringent state water quality standards probably will

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353. Ingersoll, supra note 328.
354. Id.; Recommended Development, at C-2; Harza Report, supra note 57, at III-4.
356. Id. at 17.
357. Id. at 32.
358. Total water supply storage was to include 14,000 acre-feet for Springfield and other downstream communities and another 14,000 acre-feet for low-flow augmentation for canoeing and to raise water quality during times of pollutive agricultural runoff. The state wanted the latter to be considered storage for water quality so that the federal government would pay all the costs, but the report concluded that “project economics” required its allocation to water supply. Id. at 32-33.
359. See text accompanying notes 189a-189d supra; Ingersoll, supra note 328; census predictions in note 252 supra.
360. Decatur is a major food processing center, the largest industry being the A.E. Staley Company. This firm has greatly reduced its consumption of water, from 8.9 million gallons per day in 1951 to 3.1 in 1968, Dragen & Associates, Report on Water Rates, Jan. 1953, at 23 (prepared for City of Decatur); Macon County Regional Planning Comm’n, Macon County Water Resources Mgmt. Program, at 2-9 (1971).
361. From 18.5 million gallons per day to 20 in 1972. Dragen & Associates,
produce even further reductions in consumption by industries which, for relatively small additional treatment costs, can recycle much of their water to minimize expenditures for the purchase of additional amounts. Nevertheless, the Modified Project is proceeding on the assumption that Decatur will need 58.3 million gallons of water daily by 2020.\textsuperscript{362}

2. Nitrate Pollution in the Sangamon

As intensive farming has depleted soil nitrogen, chemical fertilizers such as anhydrous ammonia have been used increasingly in central Illinois to enhance crop production. Bacteria in the soil convert ammonia to nitrate, causing the level to rise far above that found under natural conditions. Nitrate not within reach of plant roots percolates into the soil or runs off with rain water, much of it finding its way into streams.\textsuperscript{363}

Because of potential danger to human health, the U.S. Public Health Service has recommended a maximum nitrate concentration of 45 milligrams per liter (mg/1) in drinking water,\textsuperscript{364} which standard the Illinois Pollution Control Board has adopted for streams and reservoirs used for municipal water supplies.\textsuperscript{365} Yet data gathered by the Illinois Water Survey show that during the period from 1966 to 1969 the nitrate concentration in the Sangamon River a few miles upstream from Lake Decatur equaled or exceeded 53 mg/1 ten percent of the time, and 33 mg/1 50 percent of the time, and that the trend was upward.\textsuperscript{366} High nitrate levels occur particularly in the spring, when

\textsuperscript{362} Recommended Development, at 10-11, C-2. The Corps did balk at the state's proposal for storage in Friends Creek of 25,000 acre-feet beyond that which would satisfy Decatur's supposed need. When requested to designate this storage to specific water users, the state replied that it wished to dedicate the 25,000 acre-feet to water quality. When the Federal Water Pollution Control Administration rejected the state's rationale, the Corps and the state agreed on a reduction of the storage in the Friends Creek joint-use pool from 46,500 to 26,100 acre-feet, allowing 4,500 acre-feet "for the purpose of maintaining a minimum depth in the Lincoln Land Canoe Trail." Id. at 7.

\textsuperscript{363} Bacteria in human intestines, particularly in infants, can convert apparently harmless nitrate into nitrite, which in turn converts hemoglobin to methemoglobin, preventing transport of oxygen by the blood. An infant thus affected turns blue and can die from asphyxiation. B. Commoner, The Closing Circle 81-93 (1973); Gelperin, The Development of Methemoglobin in Mothers and Newborn Infants from Nitrate in Water Supplies, ILL. MEDICAL J., July 1971, at 42.

\textsuperscript{364} See Recommended Development, at i.

\textsuperscript{365} See In the Matter of Plant Nutrients, No. R71-15, concurring opinion of Jacob D. Dumelle (Mar. 28, 1972). Only California has a more lenient standard, 90 mg/1. Id.

\textsuperscript{366} J. Dawes, Nitrate Pollution of Water 16 (III. State Water Survey, 1969). A 1973 report of the Illinois Environmental Protection Agency, supra note 185, concluded that Oakley and Friends Creek reservoirs would have concentrations of nitrate-
streamflow is highest and when water supply is being accumulated in Lake Decatur (and would be accumulated in the Oakley and Friends Creek reservoirs).  

These facts were presented to the Corps, Decatur, and the State Division of Waterways prior to formulation of the Modified Project. They were urged not to increase the city's reliance upon the Sangamon for water supply when nitrate-free groundwater was plentiful and less expensive. But Decatur and her allies stood fast in their insistence upon a new reservoir supply. The first official recognition of the nitrate pollution problem came from the Secretary of the Army. In a cover letter for the Corps' December 1970 report to Congress, he stated that prior to construction Illinois would be required to provide assurances that water would not be used for human consumption unless its nitrate concentration "is under, or is reduced to fall under" 45 milligrams per liter.  

In 1972 the Illinois Pollution Control Board held hearings concerning the pollution of streams by agricultural sources. In a written opinion dealing with the nitrate problem, one member speculated on methods to improve Decatur's existing water supply: 

[T]he water supply authority could presumably dilute its pumpage by 10% or more with a low nitrate water source, if one is available. Or the water department might remove nitrates. But we do not know the feasibility and cost of either of these alternatives. . . . Other alternatives such as restricting the use of nitrate fertilizers in selected watersheds such as the Sangamon River should be considered. . . .  

The suggestion that a solution to Decatur's nitrate problem is dilution of its reservoir supply with water from another source emphasizes the importance of groundwater as an alternative to additional reservoir capacity. 

3. Availability of Groundwater  

The Corps' 1961 survey report recommending authorization of the Oakley project stated, "Groundwater is located in scattered lenses throughout the area, however, . . . neither quality nor quantity recommend it as a feasible alternative to surface water for [Decatur's] supply." This conclusion was wrong. A 1965 report by the U.S. Pub-

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367. BATTLE FOR THE SANGAMON, supra note 32, at 47.  
368. Recommended Development, at i.  
lic Health Service concerning water supply and water quality aspects of the Oakley project correctly described the Mahomet Valley, a major aquifer covering more than 3,700 square miles, as "filled with unconsolidated glacial drift material, including thick water-yielding sand and gravel deposits, . . . excellent as a potential source of water supply." In 1968 the Water Survey completed a comprehensive study of the Mahomet Valley as a groundwater source. The Survey studied all relevant geologic and hydrologic information, and constructed an analog model of the aquifer. It was estimated conservatively that 121 million gallons per day could be withdrawn without exceeding natural recharge, i.e., without lowering the water table. Actual pumpage in 1967 was only 26 million gallons per day. The report concluded that the Mahomet Valley "could meet the water supply needs of Decatur for a considerable period into the future without unreasonable interference with existing installations [elsewhere] and their projected needs."

In contrast to surface water, groundwater in the Mahomet Valley has a low nitrate content. Hence the problem of nitrate pollution would be avoided if Decatur utilized groundwater for its additional water supply needs. Although water from the aquifer is harder and contains more iron, it can be softened and the iron removed without great difficulty or expense. Nitrate removal, by contrast, is only in the experimental stage. It has never been attempted on a large scale, and if it were, the cost would be high, perhaps prohibitive.

4. Economic Analysis

The Corps calculates that under its present Oakley plan the average annual cost of the water supply function would be $491,000. Most

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371. Public Health Service, U.S. Dep't of Health, Educ., and Welfare, Water Supply and Water Quality Control Study, Oakley Reservoir, Sangamon River Basin, Ill., July 1965, at V-3. The report noted that the course of the valley misses Decatur, but did not add that it is less than 15 miles from the city or that the city already had tapped it with two wells capable of pumping five million gallons per day directly into the Sangamon River to supplement the flow into Lake Decatur.


373. Illinois Water Survey, The Mahomet Buried Bedrock Valley, An Alternative Source of Water for Decatur, Aug. 15, 1968, 2, 5, 8. The Survey simulated a well field consisting of 13 large-diameter wells capable of yielding 2 million gallons per day each (enough to satisfy Decatur's assumed need in the year 2020), spaced 1,000 feet apart in the deepest part of the valley. It was found that such a field "would not appear to tax the aquifer capability."

374. Monticello's pumpage contains only 1.3 mg/l, and that from Decatur's two standby wells has 2.9 mg/l. Visocky & Schicht, supra note 37; Harza Report, supra note 57, at IV-8.


377. Recommended Development, at C-32.
of the water supply storage is planned to be in Friends Creek reservoir, some water to be pumped there from Oakley reservoir during periods of high streamflow in the Sangamon. The Corps sets average annual benefits at $813,000, which is the estimated annual cost of building and operating the allegedly least costly alternative, a single-purpose water supply impoundment on Friends Creek.\[378\]

The cost figure is understated by an undetermined amount because it includes nothing for nitrate removal by Decatur, for loss of agricultural productivity due to restrictions on the use of fertilizer in the upper Sangamon watershed, or for diluting the reservoir water with low-nitrate water from the Mahomet Valley aquifer. One of these measures apparently would be a prerequisite to distribution of reservoir water for public consumption.\[379\]

The Corps has exaggerated benefits by using a higher interest rate in amortizing the first costs of the single-purpose alternative than in determining the annual costs of the multiple-purpose project. While initial costs of the Modified Project are amortized at 3½ percent, the rate used for the single-purpose reservoir is 6 percent, a figure based on the representative rate for municipal improvement bonds in central Illinois and therefore the cost to Decatur of obtaining funds for a locally constructed water supply project.\[380\] But the interest rate which Decatur would pay to borrow money is wholly inappropriate in evaluating a federal project from the viewpoint of national economic efficiency. According to a University of Illinois economist, this single device of choosing a higher interest rate to calculate the annual cost of the supposedly least costly alternative has overstated the estimated annual water supply benefits of the Modified Project by $305,000, for if 3½ percent were used to amortize the costs of the single-purpose alternative, water supply benefits from the multiple-purpose project would be fixed at $508,000, rather than $813,000 per year.\[381\]

The Corps also seems to have erred in stating that a staged development of groundwater to meet Decatur’s water supply needs through the year 2020 would cost more than a single-purpose reservoir on Friends Creek. The Illinois Water Survey has suggested that 13 wells could supply the 26 million gallons per day which the Division of Waterways and the Corps have assumed the city will require.\[382\] In 1968

378. Id. at C-11, C-12. The single purpose impoundment would have first costs of $11.7 million and annual operating, maintenance and replacement costs of $72,000. Id. at C-29.
379. See text accompanying notes 187, 368-69 supra.
380. Recommended Development, at C-11.
381. A. Heins, A Reconsideration of the Economic Aspects of the Oakley Reservoir Project, in BATTLE FOR THE SANGAMON, supra note 32, at 68.
Harza Engineering Company estimated the initial cost of one such well to be $65,000.\textsuperscript{383} Since most wells would not have to be constructed until 20 or more years from now, present investment would be small and future costs would be discounted to arrive at present values.\textsuperscript{384} Harza estimated the present value of both the first costs and the annual operation, maintenance, and replacement (OMR) costs of a staged, 61 million gallons per day, well field (for water supply and streamflow regulation) to be $1.2 million.\textsuperscript{385} Engineers for the Committee on Allerton Park estimated that first costs of a 26 million gallons per day well field near Friends Creek would be $700,000, and that annual OMR costs would be $50,000.\textsuperscript{386} These figures contrast sharply with the Corps’ estimates of $11.7 million in first costs and $72,000 in annual OMR costs for a single-purpose reservoir.\textsuperscript{387} If the Harza and Allerton Committee figures are even marginally correct, groundwater development would provide a far less expensive water supply.

In fact, the Allerton Committee’s figures for a well field are less than the Corps’ estimates of first costs ($644,000) and annual OMR costs ($156,000) of just the pumping station proposed for the Modified Project to lift water from Oakley reservoir to the Friends Creek “subimpoundment.”\textsuperscript{388} Thus the opponents’ proposal also would provide water for Decatur at less cost than the water supply component of the multiple-purpose project.

The Corps rejects the conservationists’ estimates. Its December 1970 report estimated that the average annual cost of a 16.8 million gallons per day (mgd), well field would be $483,400, or $28,800 per mgd.\textsuperscript{389} In contrast, the annual cost of a 30.1 million gallons per day single-purpose reservoir allegedly was $813,000, or $27,000 per mgd.\textsuperscript{390} Yet only a few months before releasing the report, the Corps told a congressional committee that the estimated annual cost of the same well field was $320,000, or $19,000 per mgd.\textsuperscript{391} In explaining why the figure in the December 1970 report was so much higher, the Corps stated:

This [$19,000 per mgd] estimate does not include the cost of transporting water to the city's treatment plant. Transportation of

\textsuperscript{383} Harza Report, at IV-9.
\textsuperscript{384} Recommended Development, at C-11.
\textsuperscript{385} Harza Report, at VII-3.
\textsuperscript{386} \textit{Battle for the Sangamon}, supra note 32, at 42-43. These figures include provision for land and pipe to transport water from the wells to the creek which would carry it to the Sangamon above Lake Decatur.
\textsuperscript{387} See note 378 \textit{supra}.
\textsuperscript{388} \textit{See id.}
\textsuperscript{389} \textit{Id. at C-11, C-12.}
\textsuperscript{390} \textit{Id.}
\textsuperscript{391} \textit{Hearings on H.R. 18127, supra note 131, pt. 1, at 98.}
water could be provided by a pipeline or by purchasing riparian rights and pumping the well water into a tributary to be allowed to flow into Lake Decatur. Adding costs for transportation would greatly increase this estimated cost.\textsuperscript{392}

With transportation costs excluded, the $19,000 figure appears inflated; presumably it was calculated by amortizing first costs at six percent, rather than at the 3 1/4 percent rate used to amortize costs of the multiple-purpose project.\textsuperscript{393} Also it exceeds even the estimate of Decatur's own consulting engineers, who for 25 years have been among the leading advocates of the Oakley project.\textsuperscript{394}

Confirming this view, John Guillou of the Division of Waterways has stated expressly that development of the Mahomet Valley aquifer would provide a less expensive water supply for Decatur than would the Modified Project if the water were transported from the wells to Lake Decatur by stream and if no expenditures were required to purchase the riparian rights of landowners between the well field and Lake Decatur to protect the city from possible withdrawals of the added water.\textsuperscript{395}

5. \textit{Illinois Riparian Rights Law}

Federal policy permits inclusion of water supply storage in a Corps of Engineers reservoir project only if anticipated benefits from that purpose exceed its costs.\textsuperscript{396} This rule is of special importance to projects such as Oakley, in which, politically, water supply is the principal aim of the entire undertaking.

\textsuperscript{392} Id. The legal necessity of "purchasing riparian rights" in order to use Friends Creek or the Sangamon to transport well water is open to question. See subsection 5. infra.

\textsuperscript{393} See text accompanying note 380 supra.

\textsuperscript{394} In 1948 Warren and Van Praag, Inc. recommended that Decatur plan another reservoir on the Sangamon rather than a well field. In January 1968 the firm conceded that it had never conducted a cost study of groundwater development. Letter from Col. Edward E. Bennett, Chicago Dist. Engineer for the Corps, to Harry C. Applewhite, Feb. 26, 1968. Later that year the firm made such a study at the instance of the Corp. They estimated that the average annual costs of a 17 mgd well field would exceed those of a 17 mgd storage capacity in Oakley reservoir by 30 percent. However, two-thirds of their estimated first costs of $6.8 million for the well field, and one-third of the $265,000 in annual OMR costs, were attributable to a pipeline for carrying the water to Decatur. Letter from Robert W. Semple, Decatur City, to Chicago Dist. Corps of Engineers, Oct. 1968, at 4, with supporting statistical supplements 1-4 by Warren and Van Praag, Inc., also dated Oct. 1968. See Champaign-Urbana Courier, Feb. 20, 1969, at 6. If costs related to the pipeline were excluded, as the Corps said it had done in reaching its figure of $19,000 per mgd, the estimated cost of well water according to Decatur's consultants would be well below that of a 17 mgd water supply component in a multiple-purpose reservoir.

\textsuperscript{395} Statement at meeting in Springfield, Oct. 16, 1970.

\textsuperscript{396} See text accompanying note 214 supra.
Since groundwater development would be less costly than the water supply purpose of the Modified Project if water could be transported from the well field to Lake Decatur by stream, at no expense, state law applicable to such transport is an important factor in evaluating the alternative. Apparently Decatur and the Division of Waterways convinced the federal government that under Illinois law Decatur could not prevent riparian owners from withdrawing water which the city introduced into the Sangamon River or Friends Creek for transport to Lake Decatur. However, Decatur never has evidenced concern about this problem in connection with the wells which it constructed along the Sangamon in 1955. In fact, Decatur is considering drilling two more.\textsuperscript{397}

The principal guide to Illinois law concerning the rights of riparian owners in water added to a natural stream is the opinion of the Illinois Supreme Court in \textit{Druley v. Adam}, 90 years ago.\textsuperscript{398} Plaintiff owned a mill below the lock system of the Illinois and Michigan Canal. After the "deep cut" was made to allow water to flow from Lake Michigan into the canal and eventually into the river above plaintiff's mill, the canal commissioners allowed defendant to locate a mill on the canal. Defendant, a nonriparian owner, diverted water and returned it to the river below plaintiff's mill. When plaintiff sought damages for loss of water power, defendant answered that he took no more water than the flow increase from the "deep cut" and that plaintiff's riparian rights attached only to the river's natural flow. The court rejected the defense and held for plaintiff, stating:

\begin{quote}
[I]t could make but little difference how, in the first instance, the water became running water [. . . . T]he moment the individual thus producing it should allow it to flow into a natural stream, and mingling with its waters thence on towards its mouth, over the soil of another, he would have voluntarily placed it beyond his power of legal reclamation or control: for, without becoming a trespasser upon the soil of that other, or obtaining a license from him, he could then do no act to arrest its onward flow, or divert its course, or in anywise enjoy its use. It would, in our opinion, be conclusive evidence of an abandonment of all right to enjoy the use or control the movement of such water.\textsuperscript{399}
\end{quote}

\textsuperscript{397} Decatur Herald, Nov. 4, 1969. Also, the U.S. Industrial Chemicals Corp., near Tuscola, has for more than 15 years pumped up to 8 million gallons per day from the Mahomet Valley aquifer into the Kaskaskia River near Champaign, using the stream to transport the water 20 miles to its plant. See Wilson, \textit{A Combination of Ground and Surface Water for Industrial Supply}, 47 J. Amer. Water Works Ass'n 865 (1955); J. Cribbett, \textit{ILLINOIS WATER RIGHTS LAW AND WHAT SHOULD BE DONE ABOUT IT} 34-36 (1958).


\textsuperscript{399} \textit{Id.} at 193-94.
This language apparently has been construed by Decatur, the state, and the federal government to mean that Decatur could not prevent intervening landowners from withdrawing well water introduced into a stream above Lake Decatur unless it first acquired their riparian rights or titles to the stream bed. However, a careful reading of the entire opinion and some thought about how a modern court probably would treat a municipality seeking to expand its water supply in a manner not harming others suggest that the parties to the Oakley project have yielded too easily to an interpretation which inflates the costs of the project's most likely alternative.

Decatur certainly has no intention of abandoning water added to the Sangamon or its tributary. The city already has a dam across the river to impede its flow. The court in Druley discussed a New Jersey case in which defendant had introduced water into a segment of a river which was used as a part of defendant's canal and then diverted the water where the canal diverged, upstream from plaintiff's land. The court rejected plaintiff's suit to enjoin the diversion. In distinguishing the case, the Illinois court stated:

[T]here was in that case but a single enterprise . . . in which the turning of the waters of [a lake and a branch of a river] into the Rockaway and the diverting of the waters of the Rockaway into the canal were concurrent acts, and necessary parts of one common whole. They were each for the purpose of supplying the canal with water. So far as the Rockaway was used, either for the reception or diversion of water, it was as a part of the canal. There could, therefore, be no ground for claiming that . . . the canal company had abandoned [the water]. Directly the reverse seems to have been true. At all times it retained actual and lawful control of these waters. Without expressly approving or disapproving the result, the court summarized the principle of the New Jersey decision as follows:

. . . [W]here, by the accomplishment of a single and entire work, water is both added to and diverted from a stream, a lower riparian proprietor can not complain, provided the same amount and quality of water shall continue to flow to him after as before. The work is regarded as a single act, and its ultimate result, in that view, whether injurious or beneficial, is alone considered.

The Illinois court thus suggested that there could be a mixture of natural and added water in a stream with the person responsible for the supplemental flow retaining sufficient control over it, as a result of an

400. See also Cribbett, supra note 397, at 36.
402. 102 Ill. at 200.
403. Id. at 201.
improvement made for that purpose, to prevent a finding of abandon-
ment to the use of other riparian owners.\textsuperscript{404} Although the riparian
owners about whom Decatur is concerned are located above the
city’s reservoir, their position would not be prejudiced so long as
they remained able to make reasonable use of the natural portion of the
streamflow. Public policy would constrain a court to protect the city
against persons seeking a windfall from the investment of public funds.
Holding for the intervening landowners simply would necessitate ex-
penditure of more such funds without apparent social justification. It
therefore appears that the parties to the Oakley project have based their
estimates of the cost of a well water supply for Decatur in substantial
part upon an unrealistic construction of a 90-year-old judicial dic-
tum.\textsuperscript{405}

\section*{C. Recreation}

Since 1962 federal law and policy have required recreation to be
considered as a primary purpose in the planning of Corps reservoir
projects.\textsuperscript{406} The Oakley project recommended to Congress in 1962
was planned prior to adoption of these requirements and therefore
did not emphasize recreation, even though it was proposed as one of the three project purposes.\textsuperscript{407} The 1962 plan claimed only nine
percent of total project benefits from recreation,\textsuperscript{408} but subsequent pro-
posals have claimed far more.

\subsection*{1. The 1966 Plan}

In its 1966 plan the Corps estimated that 30 percent of all eco-


405. Any doubt could be resolved by a statute providing that natural streams may
be used as conduits for delivery of water added by public entities and intended for
\textsection{27-1409} (1970), discussed in Waite, \textit{supra} note 404, at 881-82, authorizing de-
livery of water from public reservoirs to private purchasers downstream. Such a bill
should be more attractive to legislators than one to appropriate $17 million to pay the
State's share of the cost of the Oakley project.

of the Dep'ts of the Interior and of the Army Relative to Reservoir Project Lands,
27 Fed. Reg. 1774 (1962); \textit{S. Doc. No. 97, supra} note 20, at 10; \textit{Federal Water

407. See text accompanying note 16 \textit{supra}.

408. \textit{Oakley Summary, supra} note 322, at 25. The expectation of average an-
nual economic benefits of $147,000 was based upon an estimated 90,000 recreational
visits annually. Letter from Col. Ferd E. Anderson, Jr., Ass't. Director of Civil
Works for Central Divs., to Allen J. Ellender, Senate Comm. on Appropriations, Sept.
11, 1968, at 3.
The Corps based its prediction upon both the larger joint-use pool and the 3,000 acres purchased specifically for recreation.\textsuperscript{409} By applying assumed values per visitor day for the several types of recreation anticipated, the Corps concluded that increased visitation would produce economic benefits of $1,238,000 per year.\textsuperscript{410}

Two factors appeared inconsistent with these claimed benefits. First, vast shoreline mud flats would result from periodic storage of silt-laden waters in the flood control pool and from drawdown of the joint-use pool for low-flow augmentation during summer and fall.\textsuperscript{411} Second, pollution and eutrophication of reservoir waters was anticipated. These conditions were likely to be unattractive and inconsistent with swimming or boating, yet the Corps expected swimming, alone, to account for 40 percent of recreation benefits and 12 percent of total project benefits.\textsuperscript{412}

Corps estimates of the numbers of recreationists over the life of the project probably were based on experience at reservoirs without drawdowns.\textsuperscript{413} These estimates ignored the views of the very planning consultants on whom the Corps relied for the projections, who had recommended against swimming or water skiing in Oakley because, like Lake Decatur, it would in time be too polluted.\textsuperscript{414} Furthermore, swimming in Oakley reservoir would be contrary to official recommendations of the Illinois Department of Public Health. The Department's

\textsuperscript{409} The estimated number of visits was increased to 1,120,000 annually over a 100-year period. Letter from Col. Anderson, supra note 408, at 3.

\textsuperscript{410} Oakley Summary, supra note 322, at 25.

\textsuperscript{411} The capacity of the 636-foot joint-use pool was to be 73,800 acre-feet, of which 50,800 were allocated to streamflow regulation, 11,000 to water supply, and 12,000 to sediment storage. Id. at 23.

\textsuperscript{412} In estimating economic benefits resulting from recreational uses, the Corps had valued picnicking and hiking at $0.50 per visitor day, swimming at $1.00, boating and water skiing at $1.25, and fishing at $1.50. Oakley Summary, supra note 322, at 11. These activities were expected to provide most of the economic benefits from recreation, swimming alone accounting for 40 percent of visitors and 36 percent of benefits estimated for the project's first year of operation.

Estimates of the number of visitors annually for each recreational activity were derived by applying tables from Outdoor Recreation Resources Review Comm'n, Report (1962) to local population projections. Schellie Associates, Planning Consultants, Summary Report: The Comprehensive Plan, Organization for Planning, Future Efforts, Trends in Zoning and Dev, and Review of Existing Regs., Oakley Reservoir Dev. Plan, Apr. 1965, at A9, A29 (report prepared for Ill. Dep't of Business and Economic Dev. and Dep't of Conservation and relied upon by the Corps of Engineers for its estimates of user demand for Oakley reservoir recreation opportunities). The population projections now are known to have been too high. See text accompanying note 359 supra.

\textsuperscript{413} The ORRRC report, supra note 412, was published one year after Congress authorized the inclusion of storage for streamflow regulation. See text accompanying note 314 supra.

\textsuperscript{414} Schellie Associates report, supra note 412, at A26. Although the report stated that Lake Decatur's swimming beach had been closed due to pollution, the
position is that lakes created by damming streams or waterways are, without extensive improvements, usually unsuitable for swimming due to earth bottoms and pollution.\textsuperscript{416} The Department has stated that the public health hazard could be reduced in areas not subject to pollution from surface runoff, sewers, and drain tile discharges, by installation and proper use of high capacity equipment to chlorinate the water and a pumping system to distribute the freshly chlorinated water uniformly throughout the swimming area.\textsuperscript{418} However, the Department has suggested, as have the Corps’ own consultants, that a better swimming project would result if the parties simply built a well-equipped swimming pool.

Confronted with these recommendations, Corps officials replied that compliance by polluters with the new Illinois water quality standards would improve the condition of the water and that the cost of chlorinating portions of the reservoir was not expected to be unreasonable.\textsuperscript{417} They admitted that no such expense had been included among project costs in the economic analysis, but stated that a 15 percent contingency fund would cover the item.\textsuperscript{418}

In February 1969 the Department of Recreation and Park Administration of the University of Illinois forwarded a position statement to the Corps on the prospects for water-based recreation at Oakley reservoir.\textsuperscript{419} The statement described in detail conditions which would render the reservoir unsafe for swimming or other body-contact water recreation activities.\textsuperscript{420} The observation was made that even if the reservoir were to satisfy chemical and biological requirements established to protect public health, recreational use might still be minimal because users perceived the water as polluted and noxious. Noting that recreation accounted for a large part of Oakley’s projected economic benefits, the position statement urged that psychological criteria, as well as


\textsuperscript{416} \textit{Id.} at 3.

\textsuperscript{417} Letter from R.M. Peach, Deputy Chicago Dist. Engineer, to Bruce Hannon, June 6, 1968.

\textsuperscript{418} Letter from R.M. Peach, Deputy Chicago Dist. Engineer, to Bruce Hannon, Sept. 10, 1968.

\textsuperscript{419} Statement of the Position of the Dept’ of Recreation and Park Admin. on the Effects of Anticipated Poor Water Quality on Water-based Recreation at the Proposed Oakley Reservoir, Feb. 24, 1969 (Memorandum).

\textsuperscript{420} The statement listed the following: (a) excessive biological coliform content in streams tributary to the reservoir site, (b) excessive siltation loads in the Sangamon River causing turbidity, (c) accelerated eutrophication of the impoundment due to agricultural discharge of nutrients, and (d) conflicting project purposes creating water deficiencies in time and space detrimental to recreational use. \textit{Id.} at 3.
chemical and biological requirements, be acknowledged in benefit-cost estimation.\textsuperscript{421}

2. \textit{The Modified Project}

In recognition of the above factors, the state's 1969 Waterways Alternative did not claim any economic benefits from swimming in either Oakley or Friends Creek reservoir,\textsuperscript{422} even though the plan eliminated low-flow augmentation, the principal cause of summer drawdowns. Nevertheless, the Corps' Modified Project calls for swimming in both reservoirs to comprise 12.4 percent of all recreation benefits and 4.3 percent of total project benefits.\textsuperscript{423} Though the report offers no explanation of these optimistic predictions, analysis indicates that they are crucial to the Corps' claim of project feasibility. Since more than 60 percent of all joint costs for the multiple-purpose project are allocated to recreation, thereby making the flood control purpose (with only 12.7 percent of the joint costs) barely feasible,\textsuperscript{424} it is essential that the benefits of recreation exceed its separable and allocated joint costs. If all the Corps' claimed recreation benefits are assumed to be correct, the benefit-cost ratio of the recreation purpose still is only 1 to 1.\textsuperscript{426}

Recent developments cast further doubt upon the claimed recreation benefits. The Corps' new consultants have concluded that no motorboating should be allowed on the Oakley reservoir due to its shallowness.\textsuperscript{426} Five percent of all recreation benefits for the Modified Project are attributed to "boating" on that reservoir.\textsuperscript{427} Another hindrance to recreational use has arisen with the announcement this year of a policy of charging \textit{user fees} to cover OMR costs at new reservoir recreation areas if nonfederal interests have not contracted to pay such costs.\textsuperscript{428}

\begin{footnotesize}
\textsuperscript{421} Id. at 2.
\textsuperscript{422} Waterways Alternative, supra note 102.
\textsuperscript{423} Benefits from recreation of all kinds, based upon an estimated 921,000 visits annually, are set at $1,173,000 per year, approximately 35 percent of all project benefits. Recommended Development, supra note 113, at C-11, C-20. Of this amount $569,000 is attributed to Oakley reservoir, $213,000 to Friends Creek reservoir, and $391,000 to the greenbelt. Although the Corps' report, does not specify swimmings' economic value, it provides a "breakdown of use by activity" which estimates that swimming will comprise 18 percent of all recreation use at Oakley reservoir and 21 percent at Friends Creek. \textit{Id.} at H-64. Application of these percentages to the total estimated recreation benefits from the two reservoirs suggests swimming benefits of $100,000 from Oakley and $45,000 from Friends Creek. The total of $145,000 represents 12.4 percent of all recreation benefits and 4.3 percent of total project benefits.
\textsuperscript{424} Recommended Development, supra note 113, at Table C-22.
\textsuperscript{425} Id.
\textsuperscript{426} Champaign-Urbana News-Gazette, May 7, 1973.
\textsuperscript{427} Eleven percent of all recreation use at Oakley reservoir. Recommended Development, at H-64; see note 423 supra.
\textsuperscript{428} Corps Circular No. EC 1130-2-121, Mar. 14, 1973. Although the Federal
\end{footnotesize}
The Corps has confirmed that such fees probably will be required at Oakley and Friends Creek reservoirs. However, its projections of the numbers of persons likely to engage in recreational activities are based on experience at lakes without user fees. In light of the other disincentives discussed above, such charges certainly will discourage many potential recreationists from using the reservoirs.

D. Streamflow Regulation

The planning step which triggered widespread opposition to the Oakley project was the Corps' decision in 1966 to enlarge the reservoir to include storage to dilute Decatur's sewage effluent and enhance water quality in the lower Sangamon. This was the principal reason for the proposal to raise the joint-use pool by 15 feet to elevation 636, tripling its area and requiring the bulldozing and inundation of the entire Allerton Park bottomlands. The project recommended by the Corps in 1961 and authorized by Congress in 1962 did not include storage for low-flow augmentation. In fact, the survey report expressly stated that such storage was not needed because water pollution problems were being solved by local interests. However, that report was completed before enactment of the 1961 amendment to the Federal Water Pollution Control Act allowing the Corps to include streamflow regulation for water quality control as a principal purpose of a federal reservoir, as long as it is not a substitute for adequate treatment or other methods of controlling waste at the source. This amendment, one aspect of which already has been discussed, directed that the value of such storage be taken into account in the evaluation of the entire project and that costs be allocated to water quality control in an equitable manner. It also provided that such costs should be borne by the federal government if the benefits were "widespread or national in scope."

Water Project Recreation Act, Pub. L. No. 89-72, § 2(a), 79 Stat. 213, provides that reservoir recreation benefits are not includable in project economic evaluations unless nonfederal interests agree to pay one-half of separable first costs and all OMR costs of recreation areas, the Modified Project plan calls for the federal government to pay these costs "in accordance with policies in effect at the time the project was authorized by Congress." Recommended Development, at G-1, G-2.

430. See text accompanying notes 26-27 supra.
433. See text accompanying note 314 supra.
1. The 1966 Plan

Following Congressional authorization of the Oakley Project, the Corps initiated detailed planning. In 1964 it requested the advice of the Secretary of HEW concerning the need for water quality management in the lower Sangamon. A year later the Public Health Service (PHS) issued a report finding an immediate need for storage for streamflow regulation to maintain a dissolved oxygen concentration sufficient to support fish and aquatic life. The need arose from exceptionally high discharges of biochemical oxygen demand (BOD) by Decatur’s secondary waste treatment plant due to organic industrial wastes. The report also concluded that benefits of streamflow regulation could be termed “widespread.” Higher water quality would improve conditions for boating, fishing, and hiking along the Sangamon, and the enhanced esthetic conditions in turn would bolster land values, benefiting riparian property owners “along some 135 miles of the Sangamon.”

In 1966 the Corps announced its decision to add 50,800 acre-feet of water quality storage to Oakley reservoir. With Allerton Park threatened, open opposition to the project appeared. Storage for “pollution dilution” was to be a focal point of the ensuing attack.

a. Streamflow Regulation and Project Feasibility

Besides the addition of storage for water quality control, other modifications had been made in the project as proposed in 1961. These changes had increased project costs by substantially more than the dollar benefits which they were expected to yield, and Corps offi-

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436. Id. The report estimated that to maintain a dissolved oxygen concentration of 4 mg/l, sufficient to support fish and aquatic life, in the river immediately below Decatur 36,000 acre-feet of reservoir storage would be required for streamflow regulation by the year 2020. Id. at II-2, VIII-6, VIII-8. Annual benefits attributable to such storage were projected at $690,000, “based on the cost of the most likely alternative, a single-purpose reservoir constructed at the Oakley project site.” Id. at II-3, IX-3.

437. Id. at VIII-3.

438. Id. at IX-3.

439. Streamflow, reservoir evaporation, and reservoir seepage studies reportedly showed that the earlier PHS estimate of 36,000 acre-feet would not yield the flow required to meet the water quality need of the Sangamon River for the year 2020. Letter from Col. Ferd E. Anderson, Jr., Ass’t Director of Civil Works for Cent. Divs., to Allen J. Ellender, Senate Comm. on Appropriations, Sept. 11, 1968, at 2.

440. See note 26 supra.
cials eventually admitted that the original project was "no longer physically or economically feasible." 441

According to the Corps, the addition of storage for streamflow regulation made the project feasible. Benefits of $741,000 per year were claimed for that purpose, based on the cost of a single-purpose reservoir at the Oakley site. The benefit-cost ratio for the project now was reported to be 1.46. 442 However, the benefit-cost ratio for the flood control purpose, to which only nine percent of joint costs were allocated, was 1.02. 443 Eighty percent of the joint costs were allocated to the water quality and recreation purposes. 444

b. The Scope of Benefits

The 1961 law authorizing water quality storage in federal reservoirs provided that costs should be nonreimbursable if the benefits were "widespread." Subsequently adopted Corps regulations stated that pollution problems remaining after direct waste control and extending over long reaches of stream, or involving several self-contained centers of population and economic development, usually should be classified as widespread. 445 In finding that the benefits of low-flow augmentation in the lower Sangamon would be widespread, the Corps stated: 446

About 135 miles of river will be improved in quality through streamflow regulation. Recreational opportunities for boating and fishing will be enhanced and the esthetic value of the stream will be increased. These values of streamflow regulation are considered to be widespread and thus, the recipients and their location are not specifically identifiable.

No attempt was made to reconcile these claims of esthetic and recreational benefits with the incompatible plan to channelize most of the same stretch of the river, destroying the fish habitat, clearing vegetation for 100 feet from the sides of the channel, and dumping spoil on the banks. 447

Even if it were assumed that such benefits would accrue from

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441. Letter from Ferd E. Anderson, Jr., to Bruce Hannon, supra note 84. See text accompanying note 84 supra.
442. Benefit-cost data for the new plan showed average annual costs of $2,676,000 and benefits of $3,914,000. Benefits included $741,000 for water quality and $1,200,000 for recreation. Data enclosed with letter from Major Wilbourne A. Kelly, III, Deputy Chicago Dist. Engineer, to Bruce Hannon, Oct. 17, 1969.
443. Id.
444. Id.
447. See notes 322-23 supra and accompanying text.
improved water quality, it was not shown that they would extend over any substantial part of the lower Sangamon. The Public Health Service's report based its recommendations on stream quality samples taken a few miles below Decatur during two-day periods in August and October 1964.\textsuperscript{448} The report contained no evidence of insufficient dissolved oxygen concentrations near Springfield, 50 miles below Decatur, or at any other point downstream. After a few small tributaries had emptied into the Sangamon, providing an opportunity for self-purification, the problem caused by Decatur apparently ended and water quality was satisfactory esthetically and for recreation.\textsuperscript{449}

Moreover, with respect to the alleged recreation benefits, the Corps failed to consider that the Sangamon is not a navigable stream under Illinois law.\textsuperscript{450} Although its natural flow usually is sufficient for small boats, it is not a public stream, because it is a river over which "commerce cannot be carried on in the customary modes."\textsuperscript{451} The titles of riparian owners extend to the center of the stream, and members of the public have no easement for boating or fishing and may not use its privately owned banks for any purpose.\textsuperscript{452} Nor could the Corps' proposed flow augmentation or channel improvements make it navigable under law, for a naturally unnavigable stream cannot be rendered legally navigable by artificial means.\textsuperscript{453}

The Corps and the Public Health Service disregarded these facts, because they defined "widespread" so broadly that the geographic extent of benefits from streamflow regulation and the number of people affected were irrelevant. Until 1967 the term "widespread" was construed to include any benefits accruing from flow regulation to supplement secondary treatment providing 85 percent BOD removal.\textsuperscript{454} As late as 1969 the Chief of Civil Functions, Office of the Secretary of the Army, said that he had never seen a report from the PHS or its successor in this field, the Federal Water Pollution Control Administra-
tion (FWPCA), finding the benefits of proposed reservoir storage for streamflow regulation to be less than widespread.\textsuperscript{455}

c. Requirement of Waste Treatment at the Source

The Corps’ plan to add the new purpose of water quality control to the Oakley project ultimately foundered on the requirement that storage for streamflow regulation not be used as a substitute for adequate treatment or other controls applied at the source.\textsuperscript{458}

When, in 1961, the Federal Water Pollution Control Act was amended to authorize low-flow augmentation, advanced waste treatment had not yet been developed. At the time secondary treatment was the highest level of treatment available to municipalities and industries,\textsuperscript{457} although Congress recognized the likelihood that vigorous research would produce superior processes.\textsuperscript{458} Many cities and factories were pouring untreated or primarily treated wastes directly into small, low-flow streams. The intent of the 1961 amendment was to maintain acceptable concentrations of dissolved oxygen by increasing the flows of receiving waters.\textsuperscript{459} In many situations no feasible alternative to low-flow augmentation existed.

In 1965, when PHS reported to the Corps concerning the Sangamon, Decatur's secondary treatment plant was achieving 80 to 85 percent BOD reduction.\textsuperscript{460} The PHS recommendation for streamflow regulation was based on the assumption that the plant would be improved to achieve 90 percent reduction,\textsuperscript{461} which was considered “adequate” as the best practical treatment system available.\textsuperscript{462} However, in urging streamflow regulation, PHS and the Corps completely ignored the likely advances in technology that soon would make treatment better

\textsuperscript{455} Interview with R.A. Hertzler, Jan. 28, 1969. Most functions of HEW under the Federal Water Pollution Control Act were transferred to the Dep’t of the Interior by 1966 Reorg. Plan No. 2, effective May 10, 1966.
\textsuperscript{456} See text accompanying note 432 \textit{supra}.
\textsuperscript{457} The efficiency of municipal and industrial waste treatment plants generally is stated in terms of the percentage of biochemical oxygen demand (BOD) which is removed or degraded during treatment. “Primary” treatment, the screening of suspended solids, removes 30 to 35 percent of BOD from municipal sewage. “Secondary” treatment uses bacterial action to decompose the remaining BOD, so that combined primary-secondary treatment usually has an efficiency of 80 to 90 percent. Tertiary or “advanced” treatment can produce effluent from which more than 99 percent of BOD has been removed.
\textsuperscript{459} \textit{Id}.
\textsuperscript{460} Letter from John T. Barnhill, Deputy Commissioner, FWPCA, to Bruce Hannon, Apr. 16, 1968.
\textsuperscript{461} \textit{Id}. Why Decatur was expected to provide 90 percent BOD removal, rather than only 85 percent, was not explained. See text accompanying note 454 \textit{supra}.
\textsuperscript{462} PHS Study, supra note 435, at VIII-1.
and cheaper than storage for low-flow augmentation, even before the
economic life of the Oakley project could begin.

Early in 1967 scientists concerned about Allerton Park began
pressing the FWPCA to rescind the PHS recommendation of low-flow
storage at Oakley and to require Decatur to provide advanced waste
treatment. At that time some people within FWPCA believed that
tertiary treatment should be used more extensively in the future as an
alternative to streamflow regulation, despite current reimbursement
schemes which required local interests to pay most of the tertiary
treatment costs while allowing the federal government to pick up the
tab for stream flow augmentation.463 The Federal Water Pollution
Control Act, as amended in 1965, established the present system of
state-federal water quality standards and allowed the states until July
1967 to adopt water quality criteria and implementation and enforce-
ment plans.464

On April 1, 1967, the Illinois Sanitary Water Board announced
its proposed sewage and industrial waste treatment requirements and
effluent criteria.465 The state plan required advanced waste treatment
for all small or low-flow streams, with 95 percent BOD removal if the
dilution ratio of streamflow to effluent was less than 2 to 1, or 98 per-
cent removal if the ratio was less than 1 to 1. Since the Decatur outfall
is often within the latter category during the low-flow season,468 the
city was faced with having to provide the highest degree of advanced
treatment unless dilution water was available. With low-flow augmen-
tation as proposed by the Corps, 90 percent secondary treatment
would suffice.

At the federal level, the Department of the Interior issued a
lengthy statement in June 1967 announcing a new policy concerning
reservoir storage for flow regulation.467 The report stressed that low-
flow augmentation would be an acceptable water quality control tech-
nique only if other alternatives were not technically or economically
feasible. In analyzing the economics of storage for streamflow regu-
lation, costs of alternative single-purpose reservoirs would no longer be
an acceptable measure of benefits, “except perhaps for aesthetic consider-
ations.” The more rigorous examination of other techniques was ex-
pected to sharpen conclusions concerning feasibility and federal assist-
ance.468 Nevertheless, the Corps continued to claim exaggerated bene-

466. See note 448 supra.
467. Dep’t of the Interior, Policy Recommendations on Reservoir Storage and
Releases for Flow Regulation for Water Quality Control on Federal and Federally
Supported Projects, June 16, 1967.
468. Id. at 6. The new policy was effective immediately for the FWPCA and
fits from low-flow augmentation computed by reference to the cost of a single-purpose reservoir.489

Before the Corps could be persuaded of the economies of advanced waste treatment, the Illinois Sanitary Water Board in March 1968 adopted the treatment and effluent criteria proposed the previous year. At the same time the Water Board adopted an implementation and enforcement plan requiring Decatur to have 98 percent advanced waste treatment facilities operative by July 1972 if the ratio of streamflow to effluent remained less than 1 to 1 during the low-flow season.470 This requirement invalidated a vital assumption of the case for augmentation: that 90 percent treatment at Decatur was legally "adequate." With 98 percent treatment Sangamon water quality below Decatur would be sufficient for recreational and esthetic purposes without streamflow regulation.

In its March 1969 study of alternatives the Corps finally conceded that advanced waste treatment at Decatur would be less expensive than a single purpose reservoir for streamflow regulation.471 Shortly there-
after the state concurred, adopting the position in its Waterways Alternative that the Oakley project should not provide low-flow augmentation as a substitute for 98 percent treatment at Decatur.472

2. The Modified Project

The Modified Project includes 9,000 acre-feet of “supplemental water supply storage”473 for “recreational streamflow regulation” to maintain a canoeing depth of two feet in the Sangamon.474 At present, the state is to pay one-half of separable first costs of this storage and all separable OMR costs. If the project proceeds, an effort likely will be made to shift the entire cost to the federal government. This might be done under the 1972 amendment to the Federal Water Pollution Control Act authorizing streamflow regulation at federal expense for recreation, esthetics, and fish and wildlife if the benefits are “widespread.”475 This water quantity amendment promises to be a convenient vehicle for circumventing restrictions on federally funded streamflow regulation for water quality control, with benefits no doubt to be computed by reference to the hypothetical single-purpose reservoir.

The Corps also claims an “incidental” water quality benefit of $125,000 annually from streamflow regulation for the Sangamon canoe trail.476 It suggests these releases will help assimilate pollutants from fertilizers and animal wastes carried to the river by runoff from rural lands.477 However, the claim of monetary water quality benefits from recreational streamflow regulation violates a recently established federal policy permitting such benefits to be credited only to reservoir storage specifically allocated to water quality control.477a Moreover, the Illinois Environmental Protection Agency has concluded that streamflow regulation will not significantly improve water quality in the lower Sangamon.478 Nutrients from the sources mentioned by the Corps probably will be present in the augmentation water in even greater concentrations than

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97 percent advanced waste treatment at Decatur to be $460,000, about $300,000 less than the cost of a single-purpose reservoir.

472. Waterways Alternative, supra note 102, at 33.
473. Modified Project, supra note 111, at 7-8.
474. Recommended Development, supra note 113, at 3, C-12.
475. The present cost-sharing arrangement is defined in a document entitled Assurance of Local Cooperation, Sangamon River, Ill., Water Resources Dev. Project, May 26, 1971, signed by the Director of the Ill. Dep't of Pub. Works and Bldgs. Concerning the 1972 amendments to the Federal Water Pollution Control Act, see text accompanying note 317 supra.
476. Recommended Development, at C-12.
477. Id. at C-12, C-2.
477a. EPA, Policy on Storage and Releases, supra note 468, at para. 4c. Guidelines issued with the Policy state, at 9, “Generally, proper land management, including suitable fertilizer and pesticide application techniques, will provide the best means of controlling pollution from cropland.”
in surface waters originating below Lake Decatur during periods of low streamflow. This is because nitrate concentrations in the Sangamon are highest during peak flows in the spring, when the reservoirs would be filled in preparation for the low-flow season.\textsuperscript{479} Significant reduction of nutrient concentrations may be achieved only through municipal waste treatment and control of rural runoff. The Illinois Pollution Control Board is just beginning to grapple with the problem.\textsuperscript{480}

\textbf{E. Scope of Congressional Authorization}

The Oakley project was authorized in the Flood Control Act of 1962: "substantially as recommended by the Chief of Engineers."\textsuperscript{481} His recommendations were for a reservoir on the Sangamon with a joint-use pool elevation of 621 feet and 98 miles of channel improvements at an estimated cost of $29.6 million. The stated purposes were flood control, water supply, and recreation. That project is no longer economically feasible.\textsuperscript{482}

The Modified Project consists of an Oakley reservoir approximately the same size as that recommended in 1962, with channel improvements eliminated and a tributary reservoir and downstream greenbelt added. Streamflow regulation is another new feature. Estimated to cost $81 million, the plan is substantially different in concept, size, cost, and effects upon landowners in the area.\textsuperscript{483} Water supply storage is to be located primarily in the second reservoir, for which the dam is to be located off the Sangamon, 7½ miles from the Oakley site. The greenbelt would prevent crop losses by taking land out of production, rather than by protecting it from floods, and would affect adversely the very people whom the 1962 plan was to benefit. The only component retained from the original project is the mainstream reservoir, known to be economically unjustified.

\textsuperscript{479} See text accompanying note 367 supra.
\textsuperscript{480} See text accompanying note 369 supra.
\textsuperscript{481} The act states:
Section 203. The following works of improvement for the benefit of navigation and the control of destructive floodwaters and other purposes are hereby adopted and authorized to be prosecuted under the direction of the Secretary of the Army and the supervision of the Chief of Engineers in accordance with the plans in the respective reports hereinafter designated and subject to the conditions set forth therein. . .

The project for the Illinois River and tributaries, Illinois, Wisconsin, and Indiana, is hereby authorized substantially as recommended by the Chief of Engineers in House Document Numbered 472, Eighty-seventh Congress, at an estimated cost of $71,465,000.


\textsuperscript{482} See text accompanying note 84 supra.

\textsuperscript{483} In 1971 the attorney for the Sangamon River Improvement Association (composed of 122 owners of 21,000 acres of tillable land along the lower Sangamon)
In discussing the possibility of a tributary reservoir in its March 1969 study of alternatives, the Corps stated that it “may require new congressional authority for the Friends Creek Subimpoundment.”

When the Corps and the Illinois Division of Waterways later revealed the Modified Project on which they had agreed, Congressman Springer stated, “[T]he Oakley Dam is at the present time an entirely new project and in many ways shares no relationship to the [previous] project . . . .”

The Corps claims that the present plan is within the discretion of the Chief of Engineers under the 1962 project authorization. The Corps relies upon a 1961 letter from the Board of Engineers for Rivers and Harbors to the Chief of Engineers, which was included in the latter’s report to Congress. This letter recommended:

That all of the foregoing be accomplished generally in accordance with the plans of the Division Engineers and with such modifications thereof, including reasonable adjustments in storage capacity for water supply and other purposes in the proposed Oakley Project, as in the discretion of the Chief of Engineers may be advisable.

Such language usually is included in Corps reports recommending project authorizations and, as noted previously, has been cited by courts in upholding post-authorization modifications in other cases. Nevertheless, in view of the language of Congress’ 1962 Oakley authorization, the legal issue is whether the Modified Project is “substantially” different from the Oakley reservoir and channel improvement project proposed to Congress in 1962. On this issue the facts previously discussed give Oakley opponents a stronger case than any heretofore brought before the courts.

**F. Assurances of Local Cooperation and Cost-Sharing**

Before recommending congressional authorization of a flood control project which requires local cooperation and cost-sharing, the

484. Study of Alternatives, supra note 86, at 55.
486. Recommended Development, supra note 113, at i.
487. Letter of Nov. 13, 1961, H.R. Doc. No. 472, supra note 5. That the quoted language is the basis of the Corps’ claim that the Modified Project is within the Chief of Engineers’ discretion was expressly stated in a letter from Metullus A. Barnes, Jr., Acting Chicago Dist. Engineer, to Bruce Hannon, June 22, 1970.
488. See note 306 and text accompanying notes 307-08 supra.
489. See text accompanying note 310 supra.
Corps obtains "letters of intent" from appropriate nonfederal interests. Such letters indicate the willingness of these interests to furnish the cooperation and funds necessary for the project. After authorization, but before any appropriations are expended on construction, the state or responsible local agencies must offer formal assurances satisfactory to the Secretary of the Army that they will provide the necessary items of cooperation. If they fail to do so within five years after written request, the project is automatically deauthorized.

Since 1961 the Secretary has taken the position that "satisfactory" formal assurances shall consist of a repayment contract or other binding legal action by a local or state governing body. Federal laws governing the inclusion of water supply storage and recreational facilities in reservoir projects also require that local interests agree, before construction is begun, that they will pay their required cost shares. Section 221 of the Flood Control Act of 1970 added the following provisions to the Water Resources Planning Act of 1965:

(a) . . . [T]he construction of any water resources project by the Secretary of the Army, acting through the Chief of Engineers . . . shall not be commenced until each non-Federal interest has entered into a written agreement with the Secretary of the Army to furnish its required cooperation for the project.

(b) A non-Federal interest shall be a legally constituted public body with full authority and capability to perform the terms of its agreement and to pay damages, if necessary, in the event of failure to perform.

(f) This section shall not apply to any project the construction of which was commenced before January 1, 1972.


494. See note 491 supra.


Prior to the 1970 enactment, some district and division engineers, in disregard of regulations, apparently had been accepting local assurances short of binding legal commitments.

In the case of the Oakley project the Corps' 1962 report to Congress provided as follows:497

Local cooperation for the [project] requires that local interests maintain all roads and bridges in the reservoir area and over the improved channel; operate Lake Decatur Dam and Reservoir for flood control in accordance with regulations approved by the Secretary of the Army; and contribute in cash 15.1 percent of the first cost and 22.0 percent of the annual maintenance and operation cost [for the water supply facilities].

In the spring of 1969, a month after purchasing a tract of land at the Oakley dam site, the Corps reported to Congress that "assurances of local cooperation were furnished by local interests for all items except for maintenance of all roads and bridges, other than State owned."498 An assistant to the Secretary of the Army later explained that the Governor and the City of Decatur had provided these assurances.499 Yet, the Governor had not obligated the state to furnish the required items of cooperation and Decatur had not committed itself to pay for water supply. Governor Shapiro had written a letter to the Chicago District Engineer in 1968 stating:500

To promptly implement the furnishing of required local assurances, the Department of Public Works and Buildings, Division of Waterways, has been directed to work with your Office and other units of State Government in the determination of documents, agreements, and possible legislation relative to providing the necessary elements of local participation. . . .

The Division of Waterways denied that this letter formed an agreement with the federal government and stated that "action, by the Illinois General Assembly, will be required prior to the time the two parties can enter into a formal contract. . . ."501 The Corps subsequently conceded that the local assurances upon which it relied for the 1969 land purchase were not adequate.502

497. H.R. Doc. No. 472, supra note 5.
499. Letter from Robert E. Jordan, III, Special Ass't to the Secretary of the Army, to Bruce Hannon, Jan. 6, 1970.
It can be argued that under the federal flood control statutes "construction" does not include mere land acquisition and that formal assurances are a prerequisite only to the commencement of activities such as clearing and excavation. But that is not the position of the Corps, which construes the term "construction" to include land acquisition.

In June 1969 representatives of the state and of the City of Decatur testified before Congress that they no longer supported the Oakley project proposed by the Corps. They thus withdrew any prior assurances and urged instead adoption of the Waterways Alternative under which the state would be the local sponsor. In early 1970, after the Corps and the Division of Waterways had agreed upon the Modified Project but before Congress approved the Flood Control Act of 1970, the Corps advised Congress that "land acquisition cannot proceed until the Illinois General Assembly enacts legislation authorizing the State to furnish certain necessary items of local cooperation.

That summer the General Assembly enacted a law declaring the Modified Project to be a "desirable modification," providing in part:

The Department of Public Works and Buildings is authorized to enter into agreements with the Federal Government subject to the appropriation of funds by the General Assembly and the approval of the Governor. No contract may be entered into, nor any obligation incurred for any expenditure from the appropriation made by this Act without the approval in writing of the Governor. [Emphasis added.]

In May 1971 the Director of Public Works and Buildings executed an instrument in which the state agreed to pay the nonfederal share of costs allocated to water supply, recreational streamflow regulation, and recreation in the greenbelt, and furnish other items of local cooperation. Early in 1972 the Corps reported that the state had furnished "[F]ormal assurances of local cooperation."

503. Language in the Flood Control Act of 1936 supports this interpretation: "construction of any dam authorized herein may be undertaken without delay when the dam site has been acquired and the assurances prescribed herein have been furnished, without awaiting the acquisition of [land] required for the reservoir. . . ." 33 U.S.C. § 701c (1970).

504. See text accompanying note 271 supra.


However, the agreement signed by the Director of Public Works does not satisfy the statutory and regulatory requirement that formal local assurances be legally binding. The Governor did not approve the agreement in writing, nor has the General Assembly appropriated any funds. Thus, by the very terms of the enabling act, the state is not bound.

Moreover, under the Illinois Constitution it is possible that nothing short of appropriation of the state’s full share of project costs would bind the state to cooperate. In a 1972 letter explaining the Corps’ failure to begin work on another reservoir project in Illinois, the Louisville District Engineer stated that: “the State cannot execute acceptable assurances, water supply or recreation contracts as required by [section 221 of the Flood Control Act of 1970] due to limitations in the State Constitution.” This is one of the plaintiffs’ principal contentions in the Oakley state court suit.

Since existing local assurances pertaining to the Modified Project do not appear legally sufficient, the Corps’ position in the federal court suit probably will be that section 221 of the Flood Control Act of 1970 is inapplicable because “construction” was commenced in 1969 with the purchase of a tract of land at the dam site. To that argument there are several possible responses: (a) that land acquisition, particularly on such a small scale, does not constitute construction within the meaning of the statute; (b) that because the Modified Project is a different project from that which the Corps proposed in 1966 and abandoned in 1970, action related to the earlier plan should not be considered commencement of construction on the new project; and (c) that pre-1970 law and Army regulations required the Corps to obtain binding local assurances before beginning construction, so that land acquisition without assurances could not be considered construction. If land acquisition does not constitute construction, Oakley opponents ought not to be able to enjoin land acquisition activities on the ground that proper assurances have not been furnished. But an injunction against clearing or excavation would be in order if the assurances are legally insufficient.

G. Choice of Discount Rate

The discount rate regulation promulgated by the Water Resources Council in December 1968 provides that for previously authorized projects the interest rate used in computing benefits and costs shall be the


512. Neither the Corps nor the state court plaintiffs specify the constitutional provisions on which they rely. They may look to the following: “The General Assembly by law shall make appropriations for all expenditures of public funds by the State.” ILL. CONST. art. 8, § 26.
rate in effect immediately prior to the effective date of the regulation if the appropriate state or local governmental agencies have given, prior to December 31, 1969, satisfactory assurances to pay the required non-federal share of project costs. For all other projects a higher rate is to be used. Application of the higher rate to the Oakley Modified Project would render it economically infeasible.

The Corps claims that this regulation does not apply to projects "under construction" and, therefore, does not apply to the Oakley project. As previously explained, the Army's practice has been to freeze the discount rate for a project at the level effective at the time of the first appropriation (not expenditure) for land acquisition.

However, the discount rate regulation does not refer to appropriations, land acquisition, or construction. Its application depends upon when a project was authorized and when local sponsors gave formal assurances to pay the non-federal costs. In the Oakley case, the Modified Project may never have been authorized; the only local assurances given prior to December 31, 1969, were related to the 1966 plan, apparently were insufficient under the law and army regulations, and, in any event, were withdrawn by Decatur and the state when they proposed the Waterways Alternative. Hence, at the end of 1969 no local assurances existed with respect either to the yet to be proposed Modified Project or to any prior plan.

Thus the 3¼ percent discount rate used to evaluate the Modified Project is too low and in violation of the Water Resources Council's 1968 regulation. The proper rate would be at least 5½ percent, the rate in effect for fiscal year 1971, since Congress first was informed of the Modified Project in appropriations hearings for that year. But any rate over four percent would render the project infeasible, even if all other errors in the Corps' computation of benefits and costs were disregarded.

H. Failure to Satisfy NEPA

1. Inadequate Environmental Impact Statement

The Corps' superficial ten-page environmental impact statement for the Modified Project falls far short of legal sufficiency. It does not disclose all the environmental costs or the reasonably available al-

513. 18 C.F.R. § 704.39(d); see text accompanying note 272 supra.
514. See text accompanying note 259 supra.
516. Id. The Corps' theory is that such appropriation is the beginning of construction. See text accompanying notes 272-73 supra.
517. See notes 261-62 and accompanying text supra.
518. See note 259 supra.
519. See note 143 and accompanying text supra.
ternatives; nor does it discuss, or respond to criticisms of, the claimed monetary benefits or other aspects of the agency's economic analysis. Thus, it provides no basis to evaluate the project's benefits in light of its environmental costs or to compare the net balance with the environmental risks presented by alternative courses of action.520

Concerning environmental costs, the statement does not explain that the scientific value of the Allerton bottomland forest is attributable to the very feature which the Modified Project would destroy—the virtual freedom from man-caused changes in the ecosystem. Because no other floodplain forest of comparable size or quality remains in central Illinois, Allerton Park is a unique and irreplaceable biological preserve and control area with which to compare the effects of man's activities elsewhere.521 The Corps' statement asserts that any loss in the park's research potential as a natural area will be "offset" by a program to study how the forest is altered by artificial periodic flooding.522 This would seem to deny any uniqueness or special value of the natural area or of scientific information obtainable there.

The description of hydrologic and biological changes which would occur in the park as a result of the project suffers from serious errors and omissions. The Corps understates the increase in periodic flooding523 and fails to mention that at an elevation of 623 feet the Oakley joint-use pool will extend through the entire park, though it would not overflow existing stream banks. The statement indicates that the only effect of the new hydrologic regime upon plant and animal life will be a "minor" upward rezoning of some tree species.524 In fact, substantial changes in both species distribution and number of trees and herbaceous plants in the bottomlands and on the bluffs would occur.525 Animal populations would be reduced, and those species living only in flowing water would disappear.526

The impact statement makes no reference to the Corps' plan to raise the scenic entry road and bridge across the upper end of the park, to clear hundreds of trees which form a 2000-foot cathedral arch over the length of the road, and to replace them with fill and huge pieces of stone to resist the waters of the flood control pool.527 Similarly, the statement fails to mention the bisection of Friends Creek Lake by Interstate Highway 72 and the addition of an estimated $1 mill-

520. See text accompanying note 282 et seq. supra.
521. See text accompanying notes 28-33 supra.
523. See note 124 and text accompanying notes 124-25 and 136 supra.
525. See note 159 and text following note 126 supra.
526. See text accompanying notes 125-27 supra.
527. Recommended Development, at plate no. 2; BATTLE FOR THE SANGAMON, supra note 32, at 28, 56.
lion in the cost of the highway due to the need for a 140-foot bridge and 0.7 miles of fill.  

The statement also is silent about nitrates and other reservoir pollutants and their effects upon potability of the water supply and upon water recreation.  

The Illinois Environmental Protection Agency recently has confirmed that the proposed reservoirs will be turbid and high in algae, nutrients, and coliform count.  

In order to comply with the United States Public Health Service standard for nitrate in drinking water,\textsuperscript{531} the state will have to restrict the use of agricultural fertilizers in the upper Sangamon valley, or Decatur will have to remove nitrate from reservoir water or dilute it with low-nitrate water from the Mahomet Valley aquifer. Of these possible solutions, the first could cause significant decreases in crop yields; the second would be very expensive, perhaps prohibitively so; and the third would require development of the very groundwater supply which Oakley opponents have long urged as an alternative to reservoirs, but which Decatur and the Corps have claimed was more expensive.  

With respect to recreation, the Corps' own consultants have questioned the desirability and feasibility of swimming or motorboating;\textsuperscript{533} the Illinois Department of Public Health recommends that swimming not be allowed, but that if it is, the water be chlorinated.  

The impact statement mentions none of these problems.

Regarding alternatives, the statement is a hit-and-miss affair. Levees, recommended by the Corps for flood control throughout the rest of the Illinois River basin,\textsuperscript{535} are not discussed; neither is flood-plain zoning\textsuperscript{536} or soil and water conservation practices. The use of groundwater in lieu of new reservoir water supply is mentioned, but dismissed, partly on the untenable ground that Decatur would risk wells going dry.\textsuperscript{537} No reference is made to the better quality of the groundwater or to estimates by Harza Engineering Company and the Committee on Allerton Park that a well-water supply would cost only a fraction of the allocated cost of a reservoir supply.  

\textsuperscript{528} Champaign-Urbana Courier, Oct. 6, 1969.  

\textsuperscript{529} See text accompanying note 363 \textit{et seq.} \textit{supra}.  

\textsuperscript{530} EPA report, \textit{supra} note 185, at 1.  

\textsuperscript{531} See text accompanying notes 364 and 368, \textit{supra}.  

\textsuperscript{532} See text accompanying notes 187 and 369 \textit{et seq.}, \textit{supra}.  

\textsuperscript{533} See text accompanying notes 414 and 426 \textit{supra}.  

\textsuperscript{534} See text accompanying note 416 \textit{supra}.  

\textsuperscript{535} See text accompanying notes 18 and 340 \textit{supra}.  

\textsuperscript{536} See text following note 351 \textit{supra}. The statement says that without a publicly owned greenbelt the flood plain "would undoubtedly be developed in the future" and suffer increased damages. Recommended Development, at D-19.  

\textsuperscript{537} Recommended Development, at D-17. This disregards the Illinois Water Survey's authoritative report that the safe yield of Mahomet Valley far exceeds anticipated regional water needs. See text accompanying note 373 \textit{supra}.  

\textsuperscript{538} See text accompanying notes 383-88 \textit{supra}.
of dredging Lake Decatur to restore lost storage capacity also is ignored.539 In view of these omissions, the alternative of no federal reservoir at all is not seriously considered. Nor is consideration given to the original Waterways Alternative,540 the key features of which—as opposed to the Modified Project—were a higher flood discharge rate and a larger greenbelt.

The impact statement fails to discuss many aspects of the Corps' economic analysis of the Modified Project. Unexamined aspects include: (a) the claim that flood control benefits will result from turning profitable farmland into greenbelt;541 (b) the claim, for crop protection outside the greenbelt, of per-acre benefits too high to be correct unless the land now were being operated at a net loss, which is not the case;542 (c) the claim of flood control benefits for retention of sediment unrelated to flooding, such retention merely shifting the reduction of storage capacity and recreational value from Lake Decatur to Oakley reservoir;543 (d) use of unrealistically high projections of population and water consumption to assess water supply needs;544 (e) attribution of no cost to control of nitrate concentration in reservoir water supply;545 (f) use of excessive population projections, visitation experience at non-comparable reservoirs, and arbitrary unit values per visitor day to project large recreational benefits from a reservoir too polluted for swimming and too shallow for motorboating;546 (g) lack of mention of the cost of chlorinating swimming areas;547 (h) the claim of substantial water quality benefits from augmenting the lower Sangamon with nutrient-rich reservoir water;548 (i) lack of effort to quantify and consider scientific and education values to be lost by artificial flooding in the Allerton bottomlands;549 (j) use of a low, outdated discount rate to compare future benefits with initial costs;550 and (k) use of a higher discount rate to calculate future water supply benefits by reference to the amortized cost of a single-purpose reservoir.551

Due to these many deficiencies, the Corps' impact statement is essentially useless for evaluating the Modified Project's benefits in light of its environmental costs or for comparing the net balance with the en-

539. See text following note 348 supra.
540. See text accompanying note 96 et seq. supra.
541. See text accompanying note 333 supra.
542. See text accompanying note 335 et seq. supra.
543. See text accompanying note 334 supra.
544. See notes 189a-189d and 358-59 and accompanying text supra.
545. See text accompanying notes 369 and 379 supra.
546. See text accompanying notes 413-27 supra.
547. See text accompanying notes 416-18 supra.
548. See text accompanying notes 476-80 supra.
549. See note 240 and text accompanying notes 521-26 supra.
550. See text accompanying notes 270-73 and 513-18 supra.
551. See text accompanying notes 380-81 supra.
environmental risks presented by alternative courses of action.

2. **Lack of Good Faith Objectivity**

NEPA requires that the Corps engage in "individualized consideration" of environmental factors, conducted fully and with "good faith objectivity." Modifications of the Oakley project to avoid permanent inundation of the Allerton bottomlands and channelization of the lower Sangamon demonstrate that some environmental factors have been considered. However, less than full and objective consideration has been given to the value of, and the threat to the Allerton natural area and to the factor of reservoir pollution. Alternatives which would avoid these environmental problems have been ignored or dismissed so casually as to indicate bias. The Corps' economic analysis is slanted in various ways with the result that the computed benefit-cost ratio, though only 1.06, is grossly inflated. All of this suggests that environmental factors were considered only to the extent that such consideration was consistent with construction of some federal reservoir project at the Oakley site. Such an orientation does not satisfy NEPA's mandate of full, individualized consideration and good faith objectivity.

3. **Arbitrary Nature of the Substantive Decision**

The deficiencies in formulation and evaluation of the Modified Project also should be held to render the "actual balance of costs and benefits that was struck" arbitrary and unreasonable. Realistic estimates of the flood control, water supply, recreation, and water quality benefits, use of an appropriate discount rate, consideration of the cost of solving the nitrate problem, and a reasonable effort to evaluate the costs of altering the Allerton natural area would show total project costs to be substantially in excess of benefits. In view of the feasible and less expensive alternatives, the agency's balancing of benefits and costs does not provide a rational basis for the decision to proceed with construction of the proposed project.

**CONCLUSION**

Conceived 30 years ago as one of a series of unnecessary reservoirs to control flooding on the Illinois River, the Oakley project alone has survived because Decatur interests persuaded their congressional representatives and the Corps of Engineers to provide a federal solution to a local water-supply problem. Throughout the planning process the Corps, as in many of its projects, has strained to justify its proposals on technical grounds by exaggerating prospective benefits and

552. See text accompanying notes 289-92 supra.
553. See text accompanying notes 295-300 supra.
disregarding costs and alternatives. This first became apparent only when economists, engineers and scientists, mobilized by the threatened destruction of the floodplain forest in Allerton Park, began to scrutinize the Corps' 1966 plan for a greatly enlarged Oakley reservoir.

In 1968, as a result of the conservationists' political pressure, both the Corps and a prominent consulting engineering firm retained by the University of Illinois undertook studies of alternative ways to construct the project without adverse effects in the park. Unfortunately, because attention temporarily was focused on avoiding permanent inundation of the Allerton bottomlands, neither entity was asked to investigate the validity of the flood control purpose or the alternative of constructing no reservoir on the Sangamon River. Harza's report in 1968 and the Corps' in 1969 outlined more than a dozen combinations of measures to achieve the project's purposes, but each plan included a mainstream reservoir at Oakley with a flood control pool extending through the park.

Although conservationists employed a variety of strategies to defeat the 1966 plan, the key factor was bringing the state government actively into the planning process in 1969. This development, facilitated by the ambition and ability of the head of the Division of Waterways and the concern of a new governor, reduced the influence of Decatur, which no longer was to be responsible for providing the required nonfederal cooperation and cost-sharing, and increased the influence of the University and of the conservationists themselves. Planners and decisionmakers with concern for a broader range of interests entered the arena. This was one of the goals of the Water Resources Planning Act of 1965, but it has been realized in too few cases. The traditional pattern of alliances between the Corps and narrowly oriented local interests remains a serious problem.

In the Oakley case the advantages of participation by state officials were limited by the fact that they, too, were unwilling to consider the alternative of no federal reservoir project. Although they recognized that a mainstream reservoir was economically unjustified from a national point of view and not appropriate in the intensively farmed flatlands, they did not want to lose federal funds or political support in Decatur.

Once the state adopted the position that the Oakley joint-use pool should be kept out of the Allerton bottomlands, the threat to the park became less easy for planners and the public to understand. The area's recreational and scenic values apparently were no longer in jeopardy. The park's natural floodplain ecosystem and its value as a scientific control area remained threatened by temporary retention of water in the flood control pool. However, supporters of the project
argued that the changes in plant and animal life would be minor and indiscernible to most people.

The most damaging blow to the opponents' position was the failure in 1970 of the University of Illinois administration and trustees to insist that the project be designed so that it would not alter the hydrologic regime in Allerton Park. Conservationists' assertions that the bottomlands' scientific and educational importance would be lost thereafter were met by claims that the University would not have agreed to the destruction of its own outdoor laboratory, although that was precisely what had occurred over the protests of faculty and students. In retrospect, it appears unlikely that the state government would have insisted upon the Modified Project over the University's opposition. In any event, the University's unwillingness to insist upon preservation of its own natural area enabled the state, the Corps, federal review agencies, and Congress to rationalize that the project's environmental costs in Allerton Park would be minimal and that a satisfactory compromise had been reached.

The most far-reaching legal issue raised in pending litigation over the Oakley project is the extent to which the federal courts under NEPA will review the Corps' evaluation and balancing of benefits and costs. A willingness to go in depth into the agency's benefit-cost analysis could have profound effects upon the planning process. Other important questions involve the scope of the Corps' discretion to deviate from a plan authorized by Congress, the kind of nonfederal assurances of cooperation and cost sharing which must be obtained before construction may begin, and selection of the proper discount rate for use in project evaluation. The Corps' environmental impact statement is so patently inadequate that it does not present a substantial legal issue, and the agency almost certainly will file a revised statement before taking any action which would risk an injunction.

As a result of NEPA and the Water Resources Council's proposed standards for water projects, Corps planners hereafter will not be so insensitive to environmental values as they were in regard to Oakley before 1969. However, the agency retains a mission-orientation and a commitment to its construction program; new projects still are initiated—as was the large backlog of authorized projects—mostly by special interest groups seeking to satisfy their needs with federally funded reservoirs rather than by locally financed alternatives.

Adoption of the Modified Project illustrates that the Corps does respond to forceful advocacy by environmental interests, even during the advanced planning stage. However, the case also emphasizes the likely limits of agency response to post-authorization complaints. Plans may be altered to reduce environmental costs, but projects will not
be abandoned. Unless concerned citizens are diligent in examining possible projects at the initial stages and are timely in presenting their views to planners and the public, river valleys and billions of dollars will continue to be squandered. Judicial decisions establishing a right to substantive review of the formulation and evaluation of reservoir projects, like decisions recognizing the necessity of adequate environmental impact statements, will provide an incentive for careful planning. But the restricted scope of review will make resort to the courts a poor substitute for earlier involvement in the planning process.