

Chapter Ten: The Contemporary Scene

Old-timers in the St. Paul District office recall the great Armistice Day snowstorm of 1940. The day began with a beautiful fall Sunday morning. The temperature was in the mid-forties. Hundreds of duck hunters took advantage of the mild weather to seek out their favorite duck blinds in the backwaters of the Mississippi River. About noon the sky clouded over, rain fell, the wind came up and the ducks began to fly. Hunting was terrific. But as the hunters bagged their game limits, the rain turned to sleet and sleet to snow. Dressed for mild weather, hundreds of hunters were trapped in the midst of one of the region's worst storms. The temperature dropped to nine degrees, the blinding snow made visibility impossible and the wind blew up four- and five-foot waves in the backwaters.

Carl Tarres started for shore with his two sons. They were spotted the next morning by a Winona search party frozen in water up to their hips. A weak wave of the hand indicated that one of the sons was still alive. Carl Tarres, his second son, and twenty other hunters died in the slackwater pools of the Mississippi between Red Wing and Winona on that Armistice Day. The death toll could have been much greater. The heroic actions of Corps personnel at the Fountain City boatyard, however, saved many lives. The launch "Chippewa" searched through the night for stranded hunters. Many persons owed their lives to this hastily organized river rescue unit.¹

The gauge on the Lac qui Parle dam usually reads around 37 on the scale, at the point where salt deposits have left a permanent line in the concrete. During the drought of 1976 the water level dropped to the lowest point on the gauge, equal to the readings of the Depression years of the 1930's.

The story of the Armistice Day rescue mission illustrates one of the new dimensions of Corps responsibility. The federal engineers are ready to assist in times of natural disaster or man-made emergency. There are three other phases of current Corps obligations.

The maintenance and operation of *traditional service* includes responsibility for all those completed and continuing projects of navigation, flood control and recreation described in this historical survey. The second area of *environmental problems* encompasses five or six projects which have received wide publicity because of the conflict between economic desirability and a growing concern with the adverse effects of modern technology on ecosystems. The final category includes a new series of water-related services that the Corps has assumed as part of its effort to enhance the *quality of life*.

The current organization of the St. Paul District Corps office is similar to many other large and complex corporations and public institutions. As in other bureaucracies, preliminary surveys, detailed designs and the actual carrying out of plans are the responsibilities of sub-units, each with its own specialized skills and knowledge. The 630 permanent civilian employees of the St. Paul District are divided into two main staff groups, administrative and technical. The administrative group has offices for personnel, public affairs, computer services, legal counsel, safety, finance and records management. These offices are in turn subdivided into eleven branches, five sections, two units and one program. The technical group has three divisions: engineering; construction and operation; procurement and supply. The engineering division has six branches, twenty-one sections, six special teams and two units; construction and operation has seven branches, twelve sections and fifty-one sub-units. Procurement and supply has two main branches.

The whole organizational structure is administered by the district engineer and his deputy. They in turn report to the division engineer in Chicago, who reports to the Chief of Engineers in Washington, now under the secretary of the army. But the secretary of the army receives his orders for the Corps not from the Department of Defense, but directly from Congress. Consequently, major policy decisions are made by congressmen who are well aware of the Corps activity in their congressional districts. All of the employees in the different staffs, divisions, branches, sections, teams, programs and units work for the Corps because of legislation which defines their specific responsibilities.

The Big Emergency — World War II

The morning of December 7, 1941 was mild and pleasant in the Twin Cities. It was so mild that the district engineer, Colonel John W. Moreland, took his family out to Fort Snelling for a round of golf. It was the last time in four years the colonel would enjoy such family activities. On that Sunday afternoon Captain Lynn C. Barnes, a quartermaster officer who had been in St. Paul for a couple of months, lay down on the davenport in his apartment. His rest was interrupted by a special radio announcement informing the public that the Japanese had attacked the



Captain Lynn C. Barnes, pictured here on the construction site of the New Brighton munition plant in 1941, enjoyed working on a government project in which the engineer was given full control over contracts, materials, personnel and time schedules.

United States at Pearl Harbor. After listening to a message from President Franklin Roosevelt, Captain Barnes rushed out to the construction site of the Twin City Ordnance plant. Barnes, the chief construction engineer of the plant, found the FBI already there enforcing strict security measures.²

During the month of December, 1941, the whole mission of the St. Paul District was radically changed. Colonel John W. Moreland was put in charge of all U. S. Army construction within the district and Captain Barnes found himself reassigned from the Army Quartermaster Corps to the Corps of Engineers.³ The biggest emergency ever faced by the St. Paul District had begun. Before it was over, Captain Barnes would become district engineer in charge of many phases of military construction, manpower priorities and wartime production.

The first concern of the district was the small arms plant at New Brighton. In order to provide munitions for Great Britain under the Lend-Lease agreements, the federal government began construction in 1940 of six small arms ammunition plants.⁴ The first to be completed was in Independence, Missouri, where Captain Barnes established a reputation as a competent construction foreman whose crews did excellent work ahead of projected deadlines.⁵ His accomplishment was unique for an industry dependent on many subcontractors and infamous for not completing work on schedule. The Twin Cities was picked for another ammunition plant and 2,425 acres of land was purchased for the site north of St. Paul at New Brighton. On August 28, 1941, Colonel Joe S. Underwood, Barnes' predecessor, turned the first shovel of dirt to begin the ordnance plant construction.⁶

It soon became evident that the New Brighton plant needed a practical, tough-minded construction boss, and Captain Barnes was sent up from Missouri. Barnes was not a typical military engineer. He did not have a formal engineering background. Born in 1904 at Chanute, Kansas, Barnes had early work experience with cement and gravel contractors. During the depression, he was employed in the army reserves under the Construction Quartermaster building Civilian Conservation Corps camps in Oklahoma. In 1939 when the Eighth Army needed construction engineers to erect division camps, Barnes volunteered. He was at Camp Robinson in 1940 when he was assigned to the Lake City Ordnance plant at Independence.⁷

Army plans were to make the Twin City Ordnance Plant at New Brighton one of the world's largest suppliers of .30 caliber and .50 caliber shells. The goal was to put between 18,000 and 40,000 men and women to work there producing over three million shells a day. Only four and one-half months passed from the time that residents were moved off this property to the first shipment of ammunition to England. The amazing speed of this feat was called by Brigadier General Levin H. Campbell, "one of the world's great romantic epics."⁸ Such a united effort was only possible during a time of peril, when people believed that their very existence was threatened.

According to Captain Barnes, working under emergency pressure was an engineer's dream come true. There was no need to worry about local government, environmentalists, labor unions, shortage of materials, or even total costs. The main objective was to get the job done.⁹ Over 100 office and factory buildings were constructed. The largest measured 920 by 330 feet.¹⁰ At one period cement finishers were laying more than an acre of concrete a day. Masons put up a total of 3,650,000 bricks.¹¹ A complete sewage and water system was installed. Wells

The construction of the Twin City Ordnance Plant had the highest priority for a federal project and consequently lights were installed so men could work two 10-hour shifts.





At one time over 5,000 construction workers were involved in building the Twin Cities Ordnance Plant. In November, 1941, Colonel W. D. Styer addressed the construction units on the value of their labor as "builders of the arsenals of democracy."



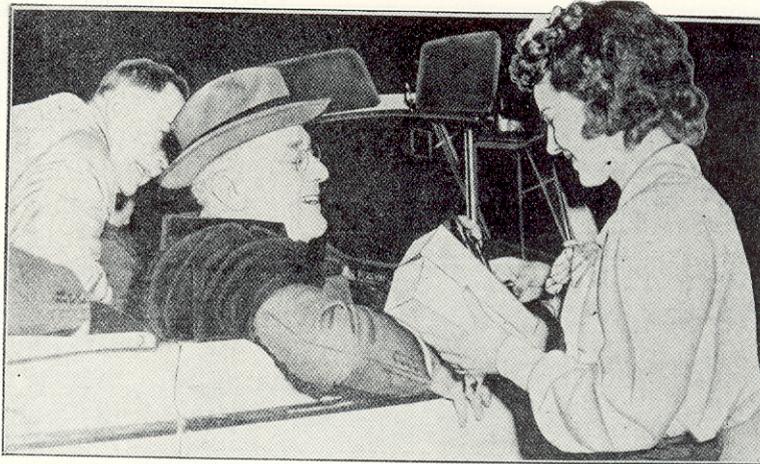
Gener Hundredmark designed many posters to encourage the productivity of workers at the Twin Cities Ordnance Plant.

were drilled to provide 6,500,000 gallons of water a day. Huge equipment moved 2,500,000 cubic yards of dirt to build a complete road and bridge network capable of handling 4,000 vehicles.¹² By mid-October 9,164 construction workers were on the job. The weekly payroll totaled \$421,500.¹³ Natural gas was piped in for a steam plant that could produce 250,000 pounds of steam per hour. Lights were installed so workmen could work around the clock. All materials were given an A-1-A priority, the highest in the country.¹⁴ The initial contracts for \$30,000,000 were soon increased to \$86,000,000.¹⁵ A complete town was built. It included a fire station, a telephone exchange, a radio station, a hospital, a security network, a power plant, firing ranges, testing laboratories, administrative offices, engineering departments, a bus system, a railroad terminal, maintenance buildings for streets, water and sewer, and of course, the numerous factory buildings for producing the ammunition.¹⁶ The construction work was completed in twenty weeks' time.

Captain Barnes' Plymouth auto became a constant presence on the site. His stenographer by his side, Barnes dictated thousands of orders. He was not the only director of construction, however. The firm of Toltz, King and Day was responsible for the layout and design. Two experienced construction companies, Foley Brothers of St. Paul and Walbridge Aldinger of Detroit, were the main contractors. The plant was built for the Federal Cartridge Corporation.¹⁷ Though this local shotgun shell producer did not have the experience of Remington Arms, Charles L. Horn, its president, proved to be a capable leader who was able to adapt his company to high capacity production. One of the greatest aids for Captain Barnes was the publicity produced by Earl D. Jenekes and his staff.¹⁸ Over 500 articles on the role of the New Brighton project appeared in the Twin City press in the three-month period. Media coverage produced a sense of mission and a spirit of participation and co-operation. The articles also brought over 25,000 applications for jobs.¹⁹ Later a special poster unit in the munitions plant designed silk-screen messages to instill the same dedication to speed productivity.²⁰ A factory newspaper, *Twin City Ordnance News*, began publication in June, 1942.

When Captain Barnes first came on the job, he met with representatives from Great Britain. They stressed the dire need in England for ammunition. In January

President Franklin D. Roosevelt made a secret visit to the New Brighton plant in September, 1942, as part of his 8,754-mile inspection tour of military establishments.



when the first shells came off the production line, they were packed in steel boxes and loaded on waiting trucks to be rushed to Wold-Chamberlain Field. Planes flew the New Brighton ammunition directly to Great Britain.²¹ A month later Barnes was informed that a second plant was needed. By this time the Twin City Ordnance Plant was under the St. Paul District Corps of Engineers. Thus, Barnes met with Colonel John W. Moreland and other Corps officials to select construction contractors. In two hours the captain of construction negotiated millions of dollars in contracts! Moreland and other West Point engineers could scarcely believe it. That certainly was not the way the Army usually did things.²² But Captain Barnes had the support of Colonel Malcolm Elliot, his superior in St. Louis, and better yet, a direct line to Brigadier General Brehon Somervell in Washington. The second plant was also built in record time.

In September, 1942, the Secret Service came to the newly promoted Major Barnes and asked him to build a series of ramps in the New Brighton plant, because visitors would be coming to inspect the production line. When Barnes asked if these persons would have military clearance, he was assured that one man would have the highest clearance in the land and that Barnes was only one of three people in St. Paul to know of the visit. During the night shift on September 19, President Franklin D. Roosevelt came down the line and talked with the workers.²³ Then he asked to speak with one of the engineers. He was introduced to Major Barnes. The President told the engineer, "Don't give me any bull. Are you really producing ammunition here?" No one was better able than Major Barnes to answer the President.

Nursery 'Evacuated' From Arms Plant Site



PROF. JONAS J. CHRISTENSEN

A nursery is being "evacuated" to make way for the Twin City ordnance plant at New Brighton. Dr. Jonas J. Christensen, University of Minnesota plant pathologist, and his family are moving several hundred of more than 25,000 trees, shrubs, vines and perennial flowers from the 40-acre plot which formerly was their summer home. The Christensen property was

his sons—Philip, 17; Donn, 12, and Robert, 10—in plant pathology.

Professor Jonas J. Christensen, a University of Minnesota plant pathologist, owned a 40-acre arboretum on the proposed property for the government's munitions plant in New Brighton. He is pictured here removing some of his specimens.

Putting together such a large construction project so rapidly required tremendous co-ordination of labor, management and materials. It is part of what Buckminster Fuller called the "industrial equation." There were many problems, but no major set-backs. Captain Barnes once requisitioned a keg of beer for the sewer pipe crew and then persuaded the men to caulk more than one pipe per hour. Within a week this group tripled its productivity. The unions had a problem at the beginning, because the wage scale in St. Paul was thirteen and a half cents an hour lower than in Minneapolis. Thus, the Minneapolis unions did not receive the same consideration for jobs until the problem was adjusted.²⁴ The charge that jobs were sold for a \$75 surcharge was investigated and found to be inaccurate.²⁵ The safety factor for workers on this project proved to be better than the national average. The lost time due to accidents was only 20.66 per million man-hours compared to the national average of 33.47.²⁶ After the plant was built over sixty percent of the work force was female. Initial plans had projected forty percent women workers.²⁷

The Izaak Walton League had raised mallard ducks on its game refuge on the original property. This Ryan Lake reserve had to be moved. There was no protest. Before farmers left their land soldiers aided them in harvesting their potatoes, hay and corn.²⁸ Paul Indykiwicz, who ran a gravel pit and cement block factory, waged a two-day fight to keep his 80 acres before he gave in to public pressure.²⁹ Dr. Jonas J. Christensen's moving problems centered around his botanical interests. Christensen, a University of Minnesota professor, had begun an experimental arboretum, where he and his family had planted over 25,000 trees, bushes, shrubs and plants. In his nursery he had 2,000 gladiolas and every variety of tree known to grow in Minnesota. When Christensen's land was condemned, he dug up many of the plants and moved them to a piece of property south of St. Paul. The next spring, the government decided to build the Gopher Ordnance munitions plant there, and he had to move his nursery a second time.³⁰

On January 5, 1943, Colonel Moreland left the St. Paul District to work on construction projects in Alaska, and Lieutenant Colonel Barnes was appointed his successor. Later in the year the thirty-nine year old Barnes was promoted to colonel, which made him one of the youngest officers of that rank in the United States Army.³¹



The district's "Minnesota" was supposedly one of the fastest launches to operate on the upper Mississippi River. District engineer, Lt. Col. Lynn C. Barnes, is pictured here with the boat in 1943.

Colonel Barnes continued to complete government priority projects on time. When the Navy awarded Cargill, Inc., a contract to build eighteen auxiliary oil and gasoline (AOG) tankers, Barnes and the Corps provided a nine-foot channel in the Minnesota River for their delivery.³² When the Air Force requested that a radio station be built at Tomah, Colonel Barnes called on Wesley E. King of Toltz, King and Day, and the two men took the train to Wisconsin. They found an old abandoned school building and had it revamped into an Air Corps radio station.³³ Hangars were also constructed for the Air Corps at Holman Field in St. Paul.

More urgent, however, was the request from Washington in February, 1944, for hundreds of light-weight assault craft for the invasion of Germany across the flooded Roer River. The Roer flows through Düren,

Germany, and joins the Maas River at Roermond on the German-Netherlands border. Within a half-hour Colonel Barnes replied that he could build and ship the large order of sixteen-foot boats if Washington would guarantee the supply of waterproof plywood. The Minnetonka Boat Works in Wayzata, Minnesota, was the contractor. The boats carried eight soldiers and their equipment.³⁴ They were used with limited effectiveness in crossing the Roer River in February, 1945.³⁵

Barnes also brought the St. Paul District into the brass bushing business in September, 1944. In Minneapolis a contract disagreement between management and the United Electrical, Radio and Machine Workers of America closed down the Twentieth Century Brass Works, a vital wartime subcontractor. The St. Paul District took over the management of the plant for five months until the labor dispute was settled.³⁶

A longer lasting assignment came at the close of World War II. The chief of engineers asked Colonel Barnes to organize a special task force to study the effects of permafrost. The pioneer in the study of permanently frozen subsurface material was Dr. Siemon William Muller, a professor of geology at Stanford University. It was he who coined the term "permafrost." The first studies of permafrost were made by the United States Geological Survey for the Intelligence Branch Office of the Chief of Engineers. In 1945 Colonel Barnes set up a three-year research program "to determine by cumulative field data and laboratory findings a set of definite answers to certain specific questions raised by the problem of general service construction in permafrost regions."³⁷ A field office was established at Northway Airport in Alaska and test drillings were begun. Because the Russians had already completed extensive studies on "vechnaya merzlota" (permanently frozen ground), a Library Research Sub-Section was set up to acquire reports of their work. Another unit, the Geophysical Reconnaissance Research Team, was ordered to develop operating procedures for the location and description of permafrost areas. The permafrost research effort, considered an emergency operation vital to the "Cold War," was administered by the St. Paul District until 1950 when it was transferred to Wilmette, Illinois, and then to the Construction Frost Effects Laboratory in Waltham, Massachusetts.³⁸

The war-time period of the "Big Emergency" is remembered with some nostalgia by colonels Moreland and Barnes. It was a time when conflict and controversy within the district diminished. Public participation, so much a part of the normal democratic tradition in civil public works projects, was absent. Orders were received and carried out; objectives were clear. Engineering problems were solved with a knowledge that the quality of workmanship could be controlled, that materials were available and results could be easily measured.

Traditional Service

One of the most visible ongoing functions of the St. Paul District is the regulation and operation of the thirteen locks and dams on the Mississippi River between Minneapolis and Guttenberg, Iowa. In conjunction with maintenance of the nine-foot channel, the Corps has a service base at Fountain City, Wisconsin, where the dredge "William A. Thompson" with a crew of sixty-six and the derrickboat "Hauser" with a crew of twelve, along with auxiliary floating plant, are stationed.³⁹ A similar unit, operating out of the vessel yard at Duluth, includes the dredge "Gaillard" with a crew of twelve, the derrickboat "Coleman" with a crew of five, the crane barge "Markus," and the tugs "Superior," "Duluth" and "Marquette" with a combined crew of twenty-four additional seamen.⁴⁰ This fleet is busy each summer with surveying, dredging and pier and dike repair. These dredging boats are crucial to the navigational interests of the nation; over seventy-five

The dredge "William A. Thompson" is now responsible for maintaining most of the nine-foot channel on the upper Mississippi River.





The Duluth visitor center has been a popular tourist stop for over seventy-five years. Recently the millionth visitor registered at the newly constructed facility.

percent of all the nation's freight on inland waterways travels on either the Mississippi or the Great Lakes system. Also at Duluth, the visitor center continues to be a popular spot for tourists. Over two million people had visited the facility by 1978, after four years of operation.⁴¹

Corps personnel regulate the six headwaters reservoirs at Pine River, Winnibigoshish, Leech, Pokegama, Sandy and Gull lakes, as well as the flood control reservoirs at Red Lake, Lac qui Parle, Lake Traverse, Orwell, Ashtabula, Homme, Eau Galle and Big Stone-Whetstone. The less visible aspect of the Corps functions includes the daily gauging of the water levels at these reservoirs. The Corps continues to monitor many other lakes and rivers in the district and to maintain records that are vital to future water resource planning.

Other traditional Corps functions include annual inspections of completed flood control projects and small boat harbors, and the processing of permits for the construction of bridges, docks, piers and other water-related structures. Studies of recent emergency flood operations are also a necessary Corps function so that preventive

techniques can be improved and local volunteers trained. Many of the personnel in the St. Paul office are qualified flood-fighting experts and are available for temporary transfer to other districts in times of crisis.

One of the areas of Corps responsibility that has not been described previously is the work that the St. Paul District performs for the International Joint Commission (IJC). This commission was established in 1909 under the terms of a treaty negotiated by Elihu Root of the United States and James Bryce of Great Britain.⁴² The IJC is composed of six commissioners, three from the United States and three from Canada, and has jurisdiction over all questions relating to boundary waters, including navigation, water power, municipal and domestic water supply, pollution, reclamation, irrigation, diversions, locks and water levels. The IJC has created a number of boards to study these questions and make recommendations to the commission.⁴³ The St. Paul District engineer is a member of the following seven of these boards which have responsibility for the boundary waters in the St. Paul District: International Lake of the Woods Control Board (created

Orwell Dam is located on the Otter Tail River near Fergus Falls, Minnesota. It is a multi-purpose reservoir completed in 1953. Besides providing flood control, water supply for pollution abatement, and wildlife refuges, the dam also has public areas for boating, fishing, and other outdoor activities.



1925), International Rainy Lake Board of Control (1940), International Prairie Portage River Board of Control (1939), International Souris-Red Rivers Engineering Board (1948), International Pembina River Engineering Board (1962), International Roseau River Engineering Board (1971) and International Garrison Diversion Study Board (1975).

The boards responsible for Lake of the Woods and Rainy Lake hold annual meetings with the residents of the area to modify regulations and establish discharge curves governing the water level of these lakes. The two boards in charge of the Souris, Red and Roseau rivers were created to study, in response to specific commission directives, the trans-boundary effects of improvements proposed or undertaken in each country on these rivers and their tributaries.

Studies were recently completed by a special task force on the Burlington Dam project in North Dakota. The Prairie Portage Board of Control was appointed by the IJC to report on the problems connected with a United States Forest Service cofferdam that washed out in 1968 and lowered the lake levels on Birch, Sucker, Moose, Newfound and Ensign lakes. After an environmental impact study was completed in 1974, a permanent dam was built. The Pembina River Engineering Board completed its studies in 1964 and is now inactive. The most recent creation of the IJC is the Garrison Diversion Study Board. This board was established in October, 1975, to determine the effects of water draining into Canada from the Garrison Diversion Unit under construction by the Bureau of Reclamation. The board completed its report in December, 1976. Because of the northward flow of a number of rivers in Minnesota and North Dakota, the St. Paul District has been an active member of the boards established by the International Joint Commission since its creation and has helped to work out mutual agreements on the regulation of boundary waters between the United States and its neighbor to the north.

Environmental Problems

All individuals working with the district are acutely aware of the environmental dimension of their mission.⁴⁴ This is not only because the St. Paul District has added many environmental specialists to its staff in the past few



The small-boat harbor at Harriet Island in the heart of downtown St. Paul is one of the recreational facilities developed by the Corps along the upper Mississippi River. The St. Paul District offices are located in the United States Post Office and Custom House pictured in the upper right-hand corner.

years, but because a number of current projects have produced heated controversies. As this history has shown, controversy is not new to the St. Paul District. What is unique is that the terms "growth," "development," "economic feasibility," "engineering design" and "technological advancement" no longer carry positive connotations for many people. Few would question that the Corps has been instrumental in the "growth" of our nation, that it has aided regional "development" through sound "engineering design" and the application of "technological advancements" using "economic feasibility" as the major criterion in decision-making. But the *Catch 22* dilemma of modern society is that with technological productivity, which has multiplied the growth of urban-industrial systems, has come the depletion of energy reserves, minerals and forests, and the pollution of air, water and land. The real environmental issue is not between "human needs" and the preservation of some rare species of fish, plant, or wildlife, but between continued technological expansion and the quality of human life, if not the future of life itself. Environmentalism has not only reduced the speed of cars and saved the nests of piping plovers, but



The Reserve Mining Company of Silver Bay, Minnesota, has been dumping 60,000 tons of tailings per day into Lake Superior since state and federal permits were first issued in the late 1940's.

has slowed down the whole technological process so that man can attempt to make a rational evaluation of his present life-style and of the alternatives available. The following projects are examples of enterprises which have been both slowed down and shut down for environmental reasons, so that short-term benefits may be evaluated in light of the long-range needs of our ecosystem.⁴⁵

Reserve Mining Case

Reserve Mining Company of Silver Bay, Minnesota, began operation of a taconite plant in 1955 with permits from the Minnesota Water Pollution Control Commission, the Minnesota Department of Conservation and the Corps of Engineers to dump tailings into Lake Superior. The state permits were issued in 1947 after a series of eight public hearings. The Corps permit, issued on April 23, 1948, prohibited discharges which "result in any material clouding or discoloration of the water at the surface . . . nor shall such tailing be discharged so as to result in any material adverse effects on . . . public water supplies."⁴⁶

At the Lake Superior Enforcement Conference in Duluth in 1969, delegates concluded that Reserve Mining's

discharge was endangering the health and welfare of persons in Minnesota, Wisconsin and Michigan. This conclusion led to a series of court battles that have made the Reserve case the longest environmental and health controversy in the nation.⁴⁷ One of the most dramatic events occurred on April 20, 1974, when United States District Court Judge Miles Lord, citing evidence of pollution, a health threat and company intransigence, closed the Reserve plant.⁴⁸ The parent companies, the Armco and Republic Steel corporations of Ohio, suddenly faced the loss of 10.6 million tons of taconite a year, seventy percent of their annual supply. Within three years these mining companies had spent close to six million dollars in legal fees to defend their right to dump tailings in Lake Superior.⁴⁹

The people of Silver Bay faced a crisis when the plant was ordered closed. The loss of income for 2,843 employees threatened the small community with economic disaster. The welfare costs of providing for these families were estimated at thirty million dollars.⁵⁰ Two days after Judge Lord's decision, the United States Eighth Circuit Court of Appeals in St. Louis overruled the district court and asked that the litigants work out an on-land disposal system. The state of Minnesota was saved from the immediate loss of an industry generating over fifteen million dollars a year in taxes and 100 million dollars annually in salaries and purchasing power.⁵¹ Lord, fearing for the health of Lake Superior communities, then ordered the Corps of Engineers to furnish filtered water for the cities of Duluth, Silver Bay, Two Harbors and Beaver Bay, all of which were dependent upon Lake Superior for their drinking water.⁵² On January 6, 1976, the appeals court upheld Lord's order.

The court order presented Colonel Forrest T. Gay, III, with an interesting dilemma, when he arrived in St. Paul on January 10, 1976, to assume duties as district engineer. Judge Lord's order for the Corps to provide drinking water was unprecedented, for the Corps only acts when Congress appropriates funds. Consequently, Colonel Gay could refuse to act and be in contempt of court, or go ahead and supply fresh water and possibly be in contempt of Congress! The district engineer asked the Department of Justice to bring a court action suit requiring Reserve Mining to pay the costs of water filtration. Before this case was settled the St. Paul District office decided to provide interim filtration regardless of the court ruling on who should bear the costs.⁵³ Plans were to divert up to six

million dollars from flood control projects and other sources. After the appeals court removed Judge Lord from the case, District Judge Edward Devitt ordered the Reserve Mining Company to pay the full costs of water filtration.⁵⁴ Later Devitt fined the mining company more than a million dollars for polluting Lake Superior and for deceiving Lord by concealing engineering studies.⁵⁵

In addition to furnishing pure water for four municipalities and helping Duluth design a new water filtration plant, the Corps of Engineers' involvement in the Reserve case has included participation with the state of Minnesota in drafting an environmental impact study and serving on a federal Environmental Protection Agency task force. Governor Wendell R. Anderson of Minnesota also asked the Corps to provide technical assistance regarding the engineering feasibility and safety of the dam to be constructed at Milepost 7 for the purpose of containing the tailings from the Reserve Mining plant.⁵⁶

In March, 1976, an editorial in a Duluth newspaper reviewed the Reserve Mining case and noted that the taconite company had been adamant in its position that profits were the main criterion for decision-making.⁵⁷ This single-minded approach frustrated even such a well-known profit-maker as Jeno F. Paulucci of Duluth. After Reserve refused to pay for filtration necessary to remove taconite fibers from drinking water, Paulucci, who markets his food products internationally, commented, "The trouble with you steel people is that you're too damn arrogant and have never abdicated your 'spiked heel' philosophy dating back to the early 1900s."⁵⁸

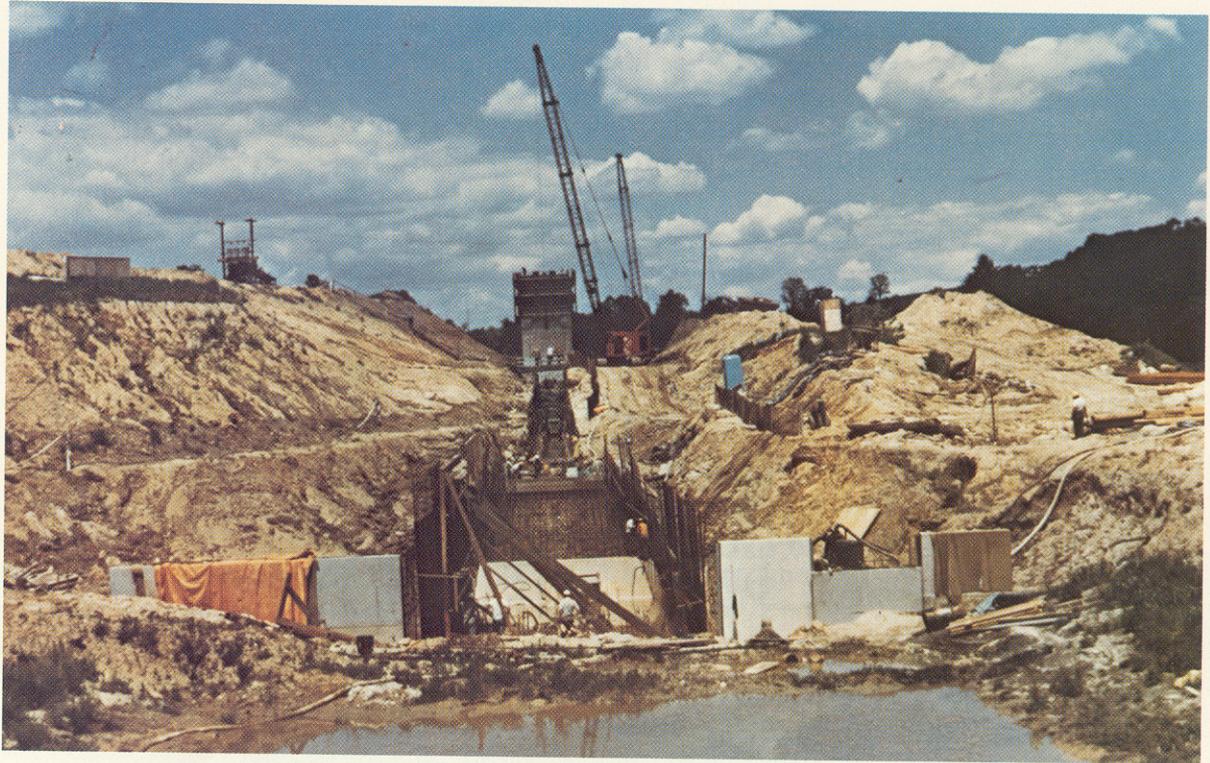
The tension between earning profits and producing pollution was finally resolved when the courts, a hearing officer, state agencies and company lawyers agreed to an on-land disposal of taconite tailings at Mile-Post 7 although environmentalists continued to oppose this site. The Corps was brought into the controversy by Representative James Oberstar and others who asked this federal agency for a final study and evaluation of the on-land disposal decision.⁵⁹ As a result, the St. Paul District prepared an Environmental Impact Study and held public hearings to discuss the major issues. Subsequently, the district engineer has issued over thirty permits governing the disposal of Reserve's tailings and has the responsibility of monitoring harbor discharges and delta stability.

La Farge Flood Control Dam

This project has taken more bends and twists in the past five years than the Kickapoo River, which the project is attempting to straighten out. As much fear, anxiety and frustration has been expressed in the controversy over flood control on the Kickapoo as has been experienced during the floods which hit this southwestern Wisconsin valley almost annually. The residents of this "Appalachia of Wisconsin," where the median income is \$3,600, have been swamped in the past five years with as much printer's ink as water.⁶⁰ The winding Kickapoo River flows through nine small communities with populations ranging from about 100 to 700 people. Major floods have occurred in 1907, 1917, 1956, 1961, 1967, 1969, 1973 and 1978.⁶¹ The tangled history of flood control for this valley has developed through six phases, and like the periodically swollen banks of the Kickapoo River, each phase pours more information, exhortations and denunciations into the mainstream of the controversy.

This artist's sketch of La Farge Lake and dam shows a portion of the conservation pool which local residents hoped would attract sportsmen and tourists and thus aid the depressed economy of the Kickapoo River valley. Thirteen recreational areas were designed for the project.





Construction of the La Farge dam was about three-fourths completed when Congress shut off funds and thus halted work on the project.

The Corps design phase began in 1938 and a preliminary survey report was completed in 1950. After World War II a new study was ordered to incorporate water conservation plans of the Department of Agriculture. During this time channel improvements, levee construction, evacuation and reservoirs were considered.⁶² In 1962, after reactivating studies, the Corps completed a report recommending a multi-purpose earth-filled dam at La Farge and other works at two downstream communities.⁶³ Preconstruction planning funds became available in 1964. In 1966 the projected structure was doubled in size to provide a 103-foot high dam and a conservation pool of 1,790 acres.⁶⁴ Recreational facilities which promised to improve the economic conditions of the valley became as important a function of the design as the flood control aspects. Land acquisition for 348 tracts began in 1969.

The court phase began in June, 1971, when the Sierra Club asked the district court to halt the project.⁶⁵ Interests of environmentalists in the case were intensified by Whitney Gould's articles in the *Capital Times*. Gould claimed that the Kickapoo project was based on "poor research" and "inadequate data" which took only a " cursory look at the dam's environmental impact."⁶⁶ Judge James E. Doyle dismissed the lawsuit, stating that the

Corps environmental analysis was adequate. A groundbreaking ceremony was held in August, 1971.⁶⁷ In May, 1972, the Sierra Club and the Citizens Natural Resources Association, under the leadership of University of Wisconsin law professor Frank Tuerkenheimer started a second lawsuit.⁶⁸ Judge Doyle again ruled that there was no legal basis for delaying the project and in October, 1973, the Circuit Court of Appeals agreed with Doyle's judgement.⁶⁹

While these court actions were pending, Governor Patrick Lucey of Wisconsin decided that the state should evaluate the flood control plans. He appointed a thirteen-member review committee. The state phase of the project began. Lucey's committee of local "Kickapooigans" and university-trained environmentalists met in May, 1971.⁷⁰ The governor was impressed with the arguments of the local representatives and decided to "give somewhat more weight to those directly involved than those with peripheral interests." He approved the dam design with the stipulation that the Corps should provide reports on soil erosion, reforestation, conservation of wild flora, acquisition of public use facilities, the effects of excessive silting and the possible destruction of archaeological ruins.⁷¹ Subsequently, the Department of Natural Resources developed a master plan for recreational use and the University of Wisconsin conducted a study on water quality.⁷² After the university submitted an adverse report, Lucey reversed his support of the project and joined Senator Gaylord Nelson in attempts to stop construction.⁷³ The major issue for both has been the problem of controlling the water quality of an artificial lake.⁷⁴ Five Corps of Engineers officials led by Assistant Secretary of the Army Victor V. Veysey met with Lucey in June, 1975, in an attempt to modify his position. The possibility of a dry dam was one of the alternatives discussed.⁷⁵

While the court actions and state reviews were going on, the construction phase had already started. By 1975 the Corps had spent fifteen and one-half million dollars in building the outlet works, the dam spillways, and the intake tower, and in relocating Highway 131. With 1,000 feet left to be built, the dam was seventy-five percent complete, but costs had escalated. Recreational facilities, reforestation and redesign of water quality control features added to the original plans, and inflationary costs for materials increased the total costs by twelve million dollars.⁷⁶



A special day was set aside in the village of La Farge to dishonor William Proxmire after he decided that the reservoir project was too expensive to justify further support.



In November, 1975, the United States Senate Subcommittee on Public Works voted to eliminate the Kickapoo dam construction funds, and thus the twenty-seven year old project entered into a moratorium phase.⁷⁷ The key figure at this stage was Senator William Proxmire. Proxmire decided that “in spite of the overwhelming support of the people who have lived with this project and dreamed of this project for years and count on this project for their salvation, I must oppose the project and ask the Senate to delete it from the Public Works bill.” Senator Proxmire appeared at the La Farge firehouse in September, 1975, and told a highly emotional audience that he would kill the project because of excessive cost.⁷⁸ Unlike Senator Nelson and Governor Lucey, who have opposed the dam for environmental reasons, Proxmire was concerned because the 1962 cost estimates for construction had tripled.⁷⁹ The senator was told that delays and demands by state and federal agencies were responsible for cost increases. However, Proxmire remained firm in his decision. The village of La Farge responded by burning Proxmire in effigy and burying the corpse. The coffin carried by a manure spreader bore the sign: “Our dam was locked in limbo, our bridge ain’t safe to walk, cause Foxy Proxy took our dough and gave it to New Yawk.”⁸⁰ Because land acquired by the Corps for the half-completed reservoir has been taken from the tax rolls,

the area has faced critical economic problems, including an inability to support its public school system.⁸¹

The sixth phase of the La Farge story unfolded when Senator Nelson asked for a review of flood control alternatives by an independent consultant.⁸² Of several consultants considered competent, the URS Corporation of New York was selected to make the \$500,000 study. Senator Proxmire and Representative Alvin Baldus also called for such a re-evaluation.⁸³ This outside evaluation phase was an attempt to reconcile a conflict which began between environmentalists and the Corps and has evolved into a heated confrontation between Kickapoogians and their elected officials. The findings of the URS study were inconclusive and the project remained in limbo through 1977. In 1978, in spite of wide-spread flooding in the Kickapoo Valley, Wisconsin senators again blocked appropriations for the project.

Dredging Operations

The two major dredging operations of the St. Paul District came under attack by the environmental agencies of the state of Wisconsin and Minnesota in the early 1970s. The Department of Natural Resources (DNR) in Wisconsin and the Minnesota Pollution Control Agency (PCA) attempted to modify the dredging practices carried out by the Corps in the maintenance of the nine-foot channel in the Mississippi and the twenty-seven-foot harbor at Duluth-Superior.

The dredge "William A. Thompson" with its flotilla of forty-seven barges, launches and pontoons enters the Mississippi every spring and sucks out more than three million cubic yards of silt from thirty-six locations on the river between the Falls of St. Anthony and Hannibal, Missouri. The sixty-five-man working crew is responsible for maintaining 242 miles of main channel in the St. Paul District and 320 miles in the Rock Island District. The District spends more than a million dollars per year depositing silt and sand on islands, in backwaters and along the shore line. The "Thompson" has a pumping capacity of 1,200 cubic yards of silt an hour.⁸⁴ Acts of Congress in 1924 and 1958 declared wooded islands, shore line and marshes along the 284-mile upper Mississippi River to be wildlife refuges. There are 194,000 acres in this habitat and the Corps has used 2,370 of these acres for "spoil" disposal.

The Wisconsin DNR requested the Corps to provide an environmental impact statement for its disposal operations.⁸⁵ The environmental study was contracted for in 1972 and published in 1974.⁸⁶ Most of the research funds went to the North Star Research Institute, which found that the dredging operations contributed to a loss of wildlife habitat, eroded the mouths of backwaters and sloughs and destroyed river bottom vegetation. The report discussed five possible alternatives which were: continuing current practices for \$740,000 a year; providing on-land disposal at selected sites for three million dollars; developing remote disposal for 4.6 million dollars; arranging for a central spoils dump at 8.4 million dollars; and the removal of spoils by barge and truck at 7.7 million dollars annually.⁸⁷ The Wisconsin-Minnesota Boundary Area Commission attacked the Corps statement for not considering the complete curtailment of barge traffic and examining the possibility of alternative transportation methods.⁸⁸ Environmentalists, it should be noted, did not oppose the operation of the Mississippi locks and dams; they believed that the backwater pools benefited both fish and wildlife.⁸⁹

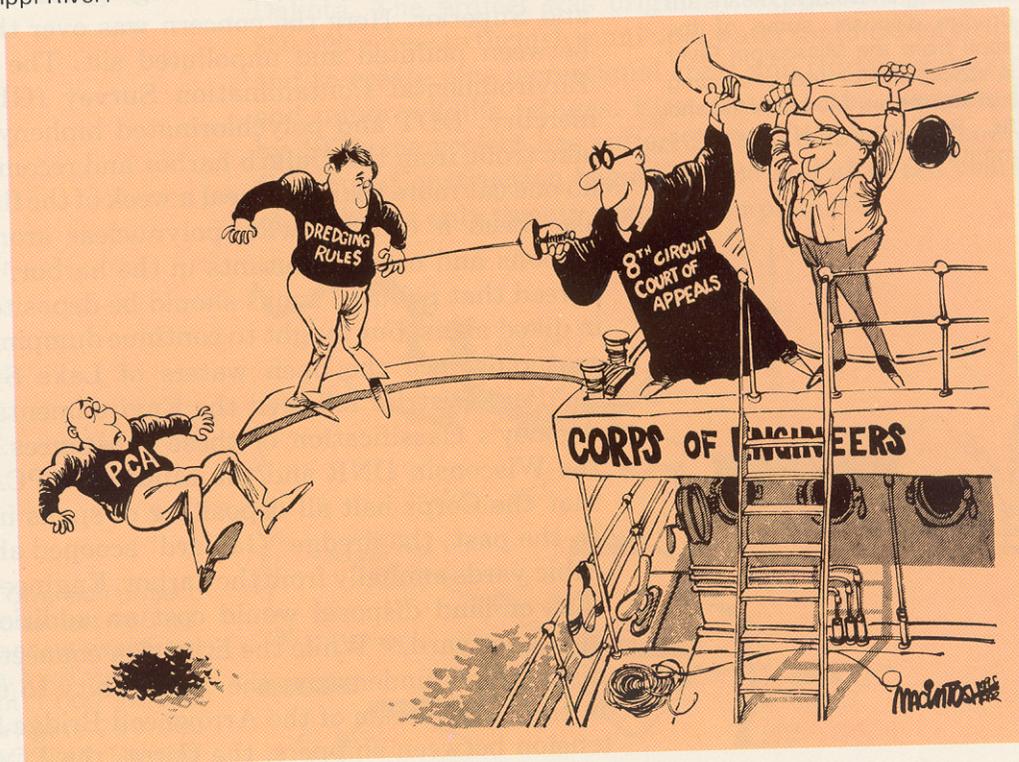
On March 6, 1974, District Judge James Doyle ordered the Corps to halt all depositing of dredged spoils on the Wisconsin side of the river thereby halting dredging itself.⁹⁰ This order was modified in May to allow the emergency dredging of ten sites, but Doyle limited Corps channel clearance to the depth of eleven feet on eighty sites and twelve feet on two others.⁹¹ Corps policy has been to dredge to thirteen feet in order to compensate for shoaling between dredging operations. Shipping was halted for a few days in July, 1974, when sand from the Chippewa River shoaled the channel at Reads Landing. Over 300,000 cubic yards of sand is dumped by the Chippewa into the Mississippi each year and accounts for twenty percent of all the maintenance on the Mississippi in the St. Paul District.⁹² Doyle lifted his injunction in 1975.⁹³

Two court cases (*Wisconsin v. Callaway* and *Minnesota v. Callaway*) kept the dredging question alive. In both suits Wisconsin and Minnesota claimed that the Corps must obtain state permission and comply with state water quality standards in all Mississippi River dredging activities. In the Minnesota case the district court issued a declaratory judgment that favored the plaintiffs, but this was reversed on May 12, 1976, by the appeals court. The

Supreme Court of the United States refused to hear an appeal by the State of Minnesota, thus upholding the Corps of Engineers' position that its activities are a part of inter-state commerce and not subject to state regulations.⁹⁴

The litigation and environmental impact statements have actually had a positive effect on dredging operations. Beginning in 1975 the Corps made public its dredging schedule for the season.⁹⁵ Most of the Mississippi silt is unpolluted and can be recycled. The Corps negotiated local agreements for building new beaches in Red Wing with dredged material and supplying sand for icy streets in Minneapolis.⁹⁶ State environmental agencies have advocated the use of dredged material as a resource rather than a waste.⁹⁷ To provide on-land disposal, the Corps has spent two and one-half million dollars for a booster barge and can now pipe spoils 5,600 feet. Before 1974 the "Thompson" was limited to a 1,600-foot disposal range.⁹⁸ Tests to determine the effect of dredging "turbidity" on water quality were contracted by the Corps at Grey Cloud Slough in 1976.⁹⁹ Public meetings at St. Paul, Winona and Prairie du Chien were conducted by Corps engineers before the 1976 dredging season so that informal agreements could be arranged for disposal sites.¹⁰⁰

The states of Wisconsin and Minnesota claimed to have jurisdiction over all dredging activities on the rivers and lakes within their respective states. The federal courts, however, have ruled that federal agencies have jurisdiction over navigable waters such as Lake Superior and the Mississippi River.





As part of the new Corps policy of finding alternative means for dredge disposal, some of the spoil from the Mississippi River is stockpiled for use in sanding icy streets in Minneapolis and St. Paul during the winter months.

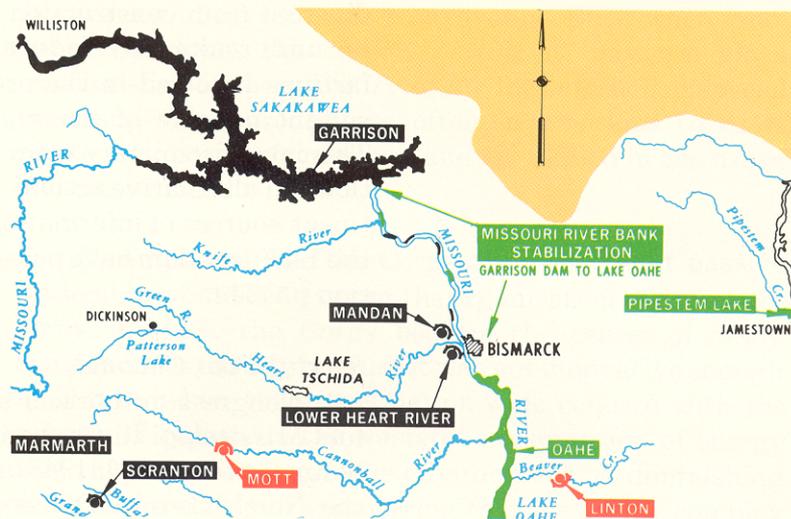
A similar dispute over dredging occurred at Duluth and Superior. Here the concern was over the distinction between polluted and unpolluted silt. The Great Lakes Environmental Contamination Survey (GLECS) found mercury, DDT and polychlorinated biphenyls (PCBs) in lake trout from the Duluth harbor and recommended that no one eat more than one meal a week of the fish. There has also been a concern with polynuclear aromatic hydrocarbons and other pollutants in the harbor.¹⁰¹ The Corps agreed that polluted spoils should be deposited on land or in diked areas, but fought to continue dumping unpolluted materials into the open waters of Lake Superior. The St. Paul District followed the Environmental Protection Agency's classification of these substances.¹⁰² However, the Wisconsin DNR and the Minnesota PCA demanded that the Corps halt all depositing of spoils in the lake.¹⁰³ In the past, the dredge "Gaillard" scooped about 100,000 cubic yards annually from the harbor. Engineers estimated that on-land disposal would cost an additional seventy cents per yard.¹⁰⁴ While the litigation connected with this dispute was under way, the opportunity to utilize spoils in the construction of the Arrowhead Bridge lessened the tension between shippers, the Corps, the PCA, the DNR

and the citizens of Superior and Duluth.¹⁰⁵ It is obvious that the dredging costs for commercial shipping must increase substantially in the future. Federal subsidies of water transportation will continue to be a heated issue. But the appeals court temporarily clarified one important aspect. The court ruled that Congress "did not intend a subordination of federal power and authority in this area."¹⁰⁶ However, late in 1977 Congress amended existing law in the form of the Clean Water Act of 1977. Under paragraph 404T of this act, states were given the right to regulate the placement of dredged material by any federal activity, including that of Corps dredging. Consequently the observance of state standards in the 1978 dredging season became a difficult new challenge for the St. Paul District.

Garrison Diversion

Although the huge 500-million-dollar Garrison Diversion project is primarily the responsibility of the Bureau of Reclamation, the Corps of Engineers between 1947 and 1960 built the 300-million-dollar Garrison Dam on the Missouri River. The 1,800 miles of canal, the pumping stations and the reservoirs of the Garrison Diversion will take water from Lake Sakakawea on the Missouri and distribute it through central and eastern North Dakota. The project was originally expected to irrigate 250,000 acres, to furnish municipal water for fourteen cities and to create nine recreational areas and thirty-six major and minor wildlife refuges. First slated to be completed by 1977, the project has suffered many delays and modifications. Construction began in 1965 and after ten years of work was only twenty percent complete.¹⁰⁷

The Garrison Diversion project, now estimated to cost 566 million dollars, is about twenty percent complete. It will carry water through about 1,000 miles of canals and irrigate 250,000 acres in eastern North Dakota.



The St. Paul District Corps of Engineers became involved in the project because three of the irrigation canals were planned to empty into the Souris River and two tributaries of the Red River both within district jurisdiction. Environmental groups such as the Committee to Save North Dakota, Inc., joined the Minnesota Pollution Control Agency and the government of Canada in an attempt to obtain a moratorium on the project.¹⁰⁸ The major concern was the salinity or TDS (total dissolved solid concentration) of the irrigation return from the diversion canals. The water quality of rivers in Minnesota and Canada would be affected by the irrigation systems. Studies conducted by the Bureau of Reclamation and Harza Engineering Company of Chicago indicated that the salinity of the Souris and the tributaries of the Red River might increase from three percent to twenty-eight percent. This increase in TDS would effect odor and taste of municipal water, increasing the cost of treatment and might change the natural flora and fauna of the region.¹⁰⁹

The Government of Canada requested the International Joint Commission to undertake a comprehensive study of the environmental effects of the Garrison Diversion project. The Commission, in turn, established the Garrison Diversion Study Board made up of representatives of the principal federal, state and provincial agencies in both countries. The Study Board created six technical committees to provide data for the report with engineers of the St. Paul District cooperating in the study.¹¹⁰ Such actions are part of a trend for developing review studies by an impartial group when the public is divided over the future of authorized projects. In such cases money is diverted from construction for a comprehensive study to be undertaken by federal, state and environmental factions involved in the problem or by an accepted consultant capable of making impartial recommendations. This interdisciplinary team is asked to make recommendations on alternative actions after having exhausted all pertinent sources of information. The Garrison Diversion and the La Farge dam have passed through this outside evaluation phase.

Twelve-Foot Channel

Congress authorized studies on increasing the nine-foot Mississippi River channel to a twelve-foot commercial barge route in 1943, 1945 and 1968.¹¹¹ In September, 1972, the North Central Division published a *Phase I Report*

on the feasibility of a twelve-foot channel above the mouth of the Ohio River, including the Illinois, St. Croix, Black and Minnesota rivers. The *Report* estimated that a favorable benefit-cost ratio of 3.4 on an annual basis existed for a twelve-foot channel from Cairo, Illinois, to Chicago. However, "the cost of a 12-foot channel on the Mississippi River upstream of Grafton, Illinois, would exceed the benefits based upon current traffic projections."¹¹² As a result of this finding, the St. Paul District has ended any participation in a twelve-foot channel study.¹¹³ It is assumed that all dams and locks on the Mississippi in the St. Paul District have "ample capacity to accommodate commercial traffic until at least the year 2040"¹¹⁴ Thus, while the twelve-foot channel remains a controversy for Corps units downstream, it is no longer an issue in the St. Paul District.¹¹⁵

The Quality of Life

The St. Paul District has been an innovative unit within the conservative traditions of the Corps of Engineers. It developed the first multipurpose system of reservoirs, planned and built the Corps of Engineers' first hydroelectric dam, provided the leadership that preserved the natural beauty of our first national park at Yellowstone, was willing to initiate court action to check the destructive actions of large corporations, began research on hydraulic laboratory testing before the Corps built its Waterways Experiment Station at Vicksburg and implemented the nation's first evacuation plan for a flood plain. The district's implementation of "Operation Foresight" also became a model in preventive flood control planning. Innovation always creates controversy. Even when innovation improves the *quality of life*, it may provide a smaller slice of the *quantity of life* for entrenched special interests. Such groups are often in positions to exert political or economic pressure and are skilled in the use of the mass media.

During the 1960s the Corps discovered that passive leadership would not exempt the organization from controversy. In fact, the Corps became the center of many controversies exactly because it was not innovative enough at a time when there was nation-wide concern with the growth of pollution, the wasteful consumption of energy and the deterioration of the environment. A diminishing faith in the ability of engineering to solve highly complex

No drought here

Leaving 5876
ST. PAUL PIONEER PRESS



During the summer of 1976 the flow of water was so low in the Twin Cities that the Corps could only permit commercial boats to use the locks in the metropolitan area. The cartoonist hit close to the truth as he visualized the problem, for sewage provided more water than the natural flow of the river.

social and cultural problems caused more criticism. During the 1970s a "new imperative" was initiated to broaden the problem-solving capacities of the district office.¹¹⁶ As a result, all engineering studies have become much more comprehensive. Special teams responsible for flood plain management, stream flow research, dam inspections and beach erosion studies are aware that their work is a part of the whole problem of water resource development. Although the Corps of Engineers is the world's largest engineering agency, it has resolved to seek the aid of other federal, state and private groups in a new interdisciplinary approach to environmental design. This has been the main thrust of new activities such as "Urban Studies" and "GREAT."

The Great River Environmental Action Team (GREAT) came into being after the dispute with the state of Wisconsin over dredging activities in the St. Paul District. GREAT is an agency of the Dredge Spoil Disposal Practices Committee which serves the Upper Mississippi River Basin Committee. It was funded in its initial year with "seed money" from the Corps of Engineers.¹¹⁷ The GREAT I study team is concerned about the Mississippi River between Minneapolis and Guttenberg, Iowa, and is made up of representatives of the Corps of Engineers, the United States Fish and Wildlife Service, the Environmental Protection Agency, the Soil Conservation Service, the Bureau of Outdoor Recreation, the Department of Transportation, the states of Wisconsin, Minnesota and Iowa, the Minnesota-Wisconsin Boundary Area Commission, the Upper Mississippi River Conservation Committee, the Izaak Walton League, the Sierra Club, the Upper Mississippi River Waterway Association, The United States Power Squadron, the Minnesota Environmental Control Citizen's Association, the Minnesota Public Interest Research Group and other citizen's organizations.

The goal of this team is to develop a river management plan "that will incorporate total river resource requirements, including fish and wildlife, navigation, recreation, watershed management and water quality." Funds for GREAT were first appropriated in 1975. The group worked out short-term recommendations for channel maintenance during the 1975 and 1976 dredging operations, and has begun to reopen blocked channels and backwaters.¹¹⁸ After three years it will evolve river management guidelines to control excessive sedimentation and soil erosion, to dispose of dredged materials, to upgrade water quality, to alleviate flood damages and to accommodate the variety of recreational and economic needs the river serves. Co-chaired by representatives of the Corps of Engineers and the United States Fish and Wildlife Service, GREAT I is divided into twelve work groups, each participating as an equal member.

GREAT I is an attempt to provide co-ordination in planning on a federal and state level, working with local and national environmental groups. Urban Studies is another program begun in 1970 to initiate co-ordination



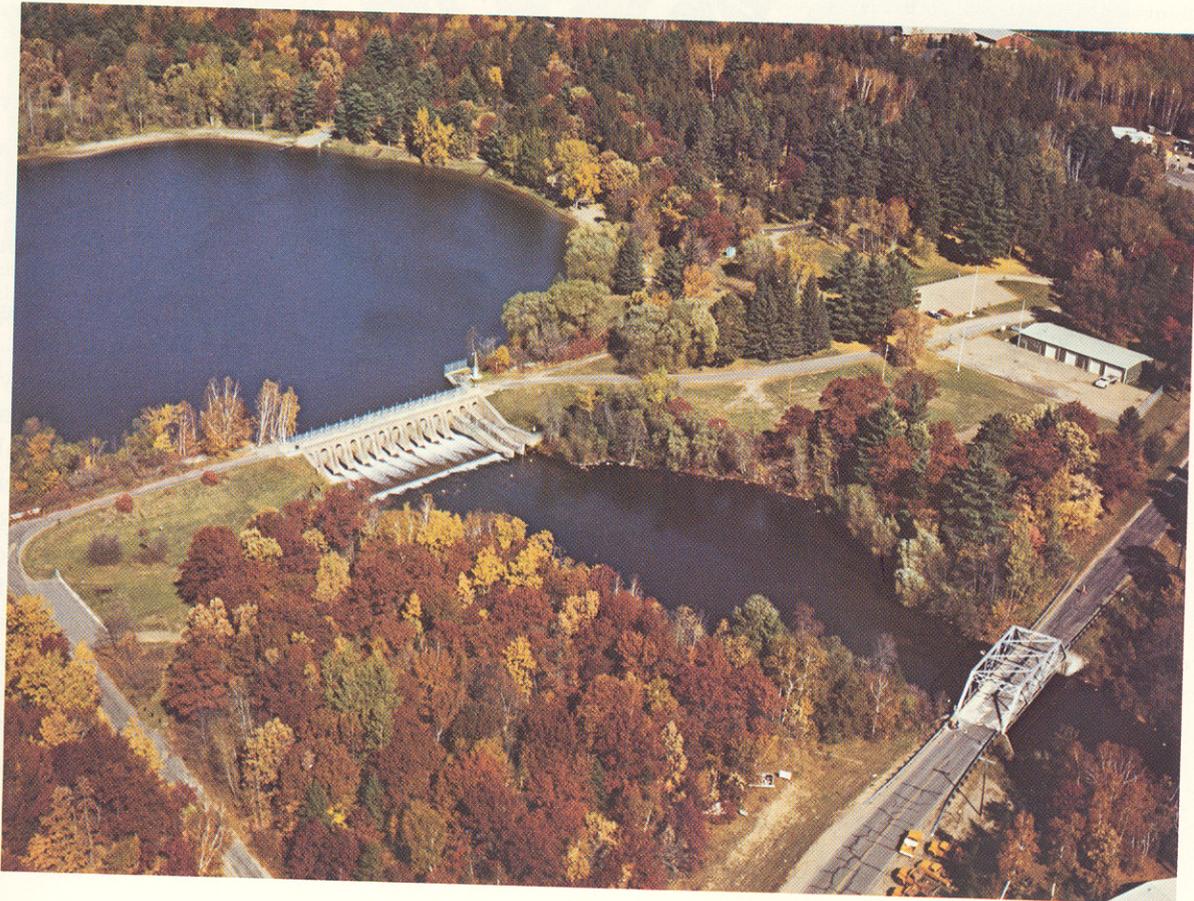
Dredging operations for the 1975 and 1976 seasons on the Mississippi River were reviewed by the GREAT I consortium and the designated dredging sites were discussed with the general public at a series of open meetings.

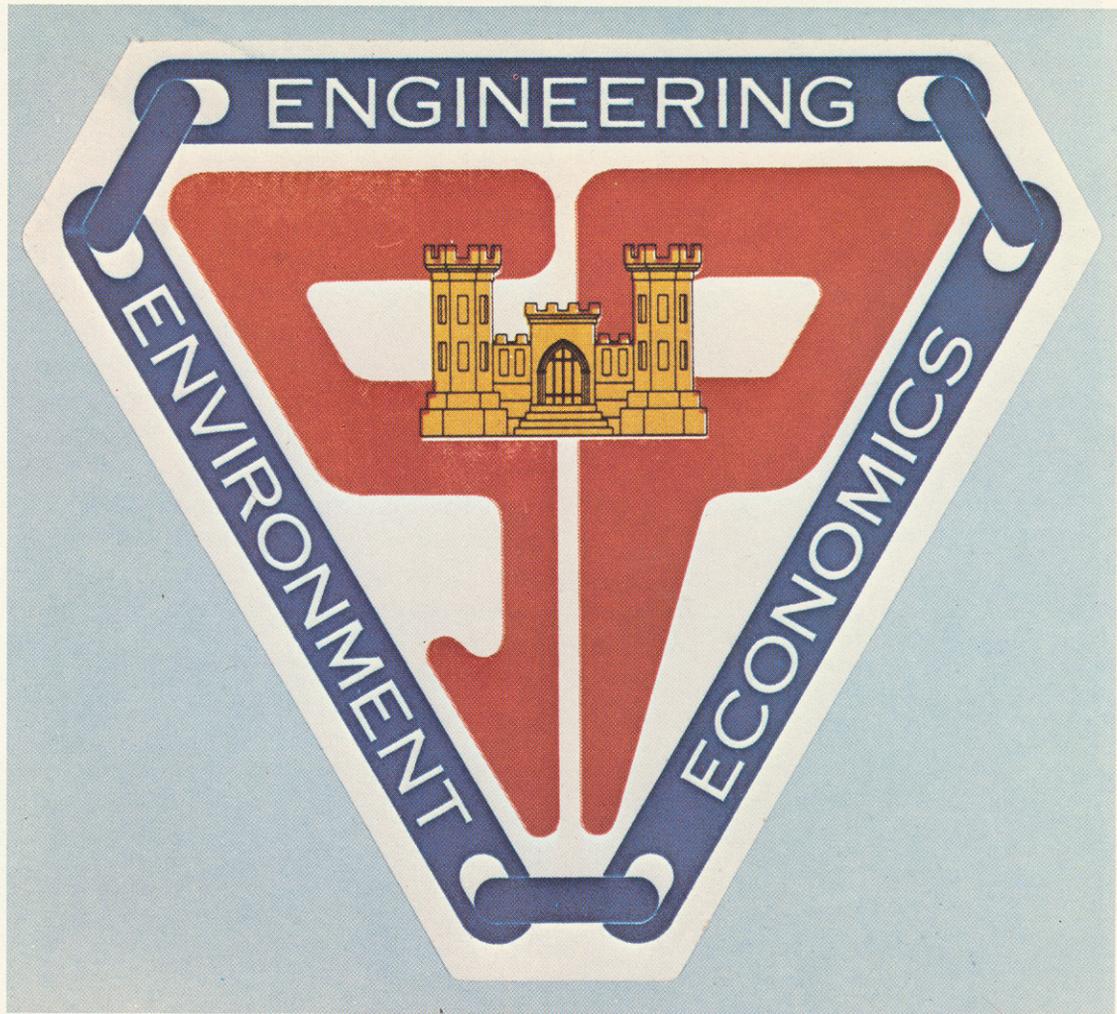
between metropolitan planners and the Corps of Engineers in the design of water supply and waste water facilities.¹¹⁹ Urban Studies assistance must be requested by state and local governments. So far, the largest metropolitan area in the district has not requested Corps aid. The district, however, did develop an in-depth study of the water supply and waste water treatment systems in the Duluth-Superior area. In June, 1976, a 235-page report was published which identified eleven specific water-related problems and made recommendations for the future needs of communities within this urban area.¹²⁰ The report will be especially important as communities attempt to comply with EPA regulations for waste water treatment and the zero pollution discharge target of 1985.

Urban Studies is not an attempt by the Corps either to duplicate the work of other agencies or to enter into the construction of sanitary facilities. It is a planning service available to local decision-makers so that the expertise of sanitary and hydraulic engineers may be utilized in the preparation of designs for the maximum use of water resources in a complex metropolitan environment.

The Corps throughout its history has been known for its hard-nosed economic feasibility studies. It has established a reputation for using the tools of technology to aid the economic growth of regional centers and the industrial development of the nation. What is often overlooked is that the Corps has provided leisure facilities for more people than any other recreational or sports agency. The 376 million visitors in 1975 to the Corps of Engineers' 350 reservoirs, 150 fish and wildlife refuges and 250 small boat harbors were more people than attended all the national parks combined or spent their money at all the major league baseball parks. Though the Corps manages only 1.5 percent of all federal recreational land, its facilities attract 36.5 percent of all federal recreational users.¹²¹ Within the St. Paul District the Corps operates seventy-six separate recreational areas at twenty-seven sites. Provisions for camping are available at twenty-six locations. All but seven of these seventy-six recreational areas are free to the public. In addition the district has developed twenty-two small boat harbors and has another nine in the planning stage.

The Pine River dam at Cross Lake in the Mississippi headwaters region is pictured here in the fall beauty of northern Minnesota.





The St. Paul District logo was designed in the 1970's and reflects the new emphasis on the environment as well as the traditional concerns with engineering and economic realities.

The logo of the St. Paul District links together the three E's: Engineering, Economics and Environment. The history of the district is a story of technology applied to the vast natural resources of the area to serve a wide variety of human needs. Since 1866 the St. Paul District has helped to integrate the Upper Mississippi Valley into a comprehensive urban system by providing economic and recreational facilities for its citizens. The work of the district has reflected the creative energies of thousands of individuals who have attempted to improve the quality of life for their neighbors and future generations. Their work has not always been understood or approved by the many social and economic interests that reside in this large and diverse section of the nation.

Notes

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4. Edward R. Stettinius, Jr., *Lend-Lease, Weapons for Victory* (New York: 1944); pp. 80-85; *St. Paul Pioneer Press*, November 16, 1941.
5. *St. Paul Pioneer Press*, November 13, 1941.
6. *Minneapolis Tribune*, August 29, 1941; for background on Colonel Underwood see *Faribault News*, August 12, 1941; *Minneapolis Times*, August 14, 1941; *Rochester Bulletin*, August 12, 1941.
7. *St. Paul Pioneer Press*, November 13, 1941.
8. *St. Paul Pioneer Press*, October 15, 1941.
9. Barnes Interview.
10. *St. Paul Pioneer Press*, December 2, 1941, reported that over 300 buildings were put up since August, but the *Minneapolis Star* of November 14, 1941, said only 100 office and factory buildings were planned.
11. *St. Paul Pioneer Press*, October 26, 1941.
12. *St. Paul Dispatch*, November 14, 1941.
13. *St. Paul Pioneer Press*, November 9, 1941; *Minneapolis Star Journal*, November 9, 1941.
14. *Minneapolis Times*, August 7, 1941; *Minneapolis Star Journal*, April 22, 1942.
15. *Minneapolis Tribune*, November 27, 1941.
16. *St. Paul Pioneer Press*, October 26, 1941; *Stillwater Gazette*, September 30, 1941; *Minneapolis Tribune*, November 27, 1941.
17. *St. Paul Dispatch*, November 5, 1941; *St. Paul Pioneer Press*, December 2, 1941.
18. *Hibbing Tribune*, August 29, 1941.
19. *Minneapolis Times*, January 14, 1942.
20. Most of the posters were designed by Gene Hundredmark, see *St. Paul Pioneer Press*, February 15, 1943.
21. Barnes Interview.
22. *St. Paul Pioneer Press*, February 3, 1942; and Barnes Interview.
23. *New York Times*, October 2, 1942; *Boston Daily Record*, October 2, 1942; *St. Paul Pioneer Press*, October 2, 1942.
24. *Minneapolis Star Journal*, August 9, November 27, 1941.
25. *Minneapolis Star Journal*, November 27, 1941; *Minneapolis Times*, November 26, 1941; *St. Paul Pioneer Press*, October 3, November 29, 1941; *Minneapolis Star Journal*, December 5, 1942.
26. *St. Paul Dispatch*, January 12, 1942.
27. *St. Paul Pioneer Press*, September 30, 1941, April 15, 1942; *Minneapolis Sunday Tribune*, April 5, 1942.
28. *St. Paul Dispatch*, August 29, 1941; *Minneapolis Tribune*, September 30, 1941; *Minneapolis Star Journal*, September 15, 1941.
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31. Undated clipping in Colonel Lynn C. Barnes, Scrapbook in Barnes' possession.
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48. *Minneapolis Star*, April 24, 1974; *Capital Times* (Madison), June 24, 1974; *Duluth Herald*, July 10, 1974; *St. Paul Pioneer Press*, July 10, 1974; *Fargo Forum*, October 24, 1974.
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54. *Two Harbors Chronicle News*, February 23, 1976; *St. Paul Pioneer Press*, February 22, 1976; *Minneapolis Tribune*, August 31, 1976.
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58. *Duluth Herald*, April 29, 1974, April 12, 1976.
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