

Harbor  
Doc. 32

RED WING HARBOR, MINN.

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY, DATED AUGUST 3, 1958, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND AN ILLUSTRATION, ON A REVIEW OF REPORTS ON RED WING HARBOR, MINN., REQUESTED BY RESOLUTIONS OF THE COMMITTEE ON PUBLIC WORKS, UNITED STATES SENATE, ADOPTED MARCH 24, 1956, AND HOUSE OF REPRESENTATIVES, ADOPTED JUNE 27, 1956



FROM CONGRESSMAN  
ALBERT H. QUIE  
DENNISON, MINN.

OCTOBER 8, 1958.—Referred to the Committee on Public Works and ordered to be printed with one illustration, pursuant to Public Law 85-863, approved September 2, 1958

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### LIST OF ILLUSTRATIONS MADE IN CONNECTION WITH THE REPORT OF THE DISTRICT ENGINEER

(Only pl. 1 is printed)

1. General plan.
2. Cross sections and boring logs.

### LIST OF APPENDIXES MADE IN CONNECTION WITH THE REPORT OF THE DISTRICT ENGINEER

(Only appendix B printed)

- Appendix A. Detailed estimates of first cost.
- Appendix B. Determination of local cash contribution.

LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY,  
*Washington, D. C., October 6, 1958.*

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a favorable report dated August 21, 1958, from the Chief of Engineers, Department of the Army, together with accompanying papers and an illustration, on a review of reports on Red Wing Harbor, Minn., requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted March 24, 1956, and June 27, 1956, respectively.

In accordance with section 1 of Public Law 14, 79th Congress, and Public Law 732, 79th Congress, the views of the State of Minnesota are set forth in the enclosed communication, together with the views of the Department of the Interior in accordance with Public Law 732, 79th Congress.

The Bureau of the Budget advises that there is no objection to the submission of the proposed report to the Congress; however, it states that no commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. A copy of the letter from the Bureau of the Budget is enclosed.

Sincerely yours,

WILBER M. BRUCKER,  
*Secretary of the Army.*

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
*Washington, D. C., September 25, 1958.*

THE HONORABLE THE SECRETARY OF THE ARMY.

MY DEAR MR. SECRETARY: Deputy Assistant Secretary Bacon's letter of September 9, 1958, submitted the proposed report of the Chief of Engineers on Red Wing Harbor, Minn., requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted March 24, 1956, and June 27, 1956, respectively.

The Chief of Engineers recommends modification of the existing project for improvement of the Mississippi River between the Missouri River and Minneapolis, Minn., to provide for enlargement of

the harbor at Red Wing by dredging a basin, averaging 300 feet in width and 1,200 feet in length, at a depth of 9 feet below project pool level, in an area west of the existing industrial harbor, at an estimated cost to the United States of \$174,400 for construction and \$1,800 annually for maintenance of the entire industrial harbor. The recommendation is subject to certain conditions of local cooperation including the requirement that local interests contribute in cash 2.3 percent of the cost of construction, exclusive of lands and rights-of-way, facilities, and aids to navigation, and that such contribution, presently estimated at \$4,000, be paid in a lump sum prior to commencement of construction.

I am authorized by the Director of the Bureau of the Budget to advise you that there would be no objection to the submission of the proposed report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

CARL H. SCHWARTZ, Jr.,  
*Chief, Resources and Civil Works Division.*

STATE OF MINNESOTA,  
DEPARTMENT OF CONSERVATION,  
*St. Paul, June 24, 1958.*

Maj. Gen. E. C. ITSCHNER,  
*Chief of Engineers,  
Department of the Army, Washington, D. C.*

DEAR SIR: Your letter of May 27, 1958, is hereby acknowledged.

The United States Corps of Engineers survey report on the above referenced project has been examined by the Division of Waters, Minnesota Department of Conservation.

That division reports that the proposed improvement will economically augment navigation terminal facilities at Red Wing and recommends that the project be completed.

Therefore, in accordance with the report of the examining agency, and in view of the estimated benefit-cost ratio in excess of 1.37 to 1, I approve the project for construction on behalf of the State of Minnesota, and urge that the work be expedited to the fullest extent possible.

It is assumed that every precaution will be taken to protect fish and wildlife values in the area, both during construction and after completion of the project.

Very truly yours,

GEORGE A. SELKE,  
*Commissioner of Conservation.*

DEPARTMENT OF THE INTERIOR,  
OFFICE OF THE SECRETARY,  
*Washington, D. C., August 19, 1958.*

Maj. Gen. E. C. ITSCHNER,  
*Chief of Engineers,  
Department of the Army, Washington, D. C.*

DEAR GENERAL ITSCHNER: Reference is made to your letter of May 27 transmitting for our comments copy of your report, together with the reports of the Board of Engineers for Rivers and Harbors and of the district and division engineers, on a review of reports on Red Wing Harbor, Minn. Your report recommends modification of the existing project for improvement of the Mississippi River between the Missouri River and Minneapolis, Minn., to provide for enlargement of the harbor at Red Wing, Minn.

The United States Fish and Wildlife Service advises that the proposed improvement would have insignificant effects upon fish and wildlife resources.

The opportunity of commenting on your report is appreciated.  
Sincerely yours,

FRED G. AANDAHL,  
*Assistant Secretary of the Interior.*

## RED WING HARBOR, MINN.

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF  
THE ARMY

DEPARTMENT OF THE ARMY,  
OFFICE OF THE CHIEF OF ENGINEERS,  
*Washington, D. C., August 21, 1958.*

Subject: Red Wing Harbor, Minn.  
To: The Secretary of the Army.

1. I submit for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to the resolution of the Committee on Public Works of the United States Senate, adopted March 24, 1956, requesting the Board to review the report of the Chief of Engineers on Red Wing Harbor, Minn., published as House Document No. 103, 76th Congress, 1st session, with a view to determining whether any modification of the existing project should be made at the present time; and the resolution of the Committee on Public Works of the House of Representatives, adopted June 27, 1956, requesting the Board to review reports on Red Wing Harbor, Minn., published in House Document No. 103, 76th Congress, 1st session, and other pertinent reports, with a view to determining whether any modification of the existing project should be made at this time, with particular reference to channel improvement for industrial harbor purpose.

2. The district and division engineers report that improvement of the industrial harbor at Red Wing is advisable to meet the needs of established and prospective navigation. They estimate that the average annual benefits, will exceed the annual carrying charges by a ratio of 1.37 to 1.

3. After full consideration of the reports of the district and division engineers, the Board recommends modification of the existing project for improvement of the Mississippi River between the Missouri River and Minneapolis, Minn., to provide for enlargement of the harbor at Red Wing, Minn., by dredging a basin, averaging 300 feet in width and 1,200 feet in length, at a depth of 9 feet below project pool level, in an area west of the existing industrial harbor; all generally in accordance with the plans of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost of \$174,400 for construction and \$1,800 annually for maintenance of the entire industrial harbor; provided that, prior to construction, local interests agree to (a) contribute in cash 2.3 percent of the cost of construction, exclusive of lands and rights-of-way, facilities, and aids to navigation, and that such contribution, presently estimated at \$4,000, be paid in a lump sum prior to commencement of construction, the final allocation of cost to be made after actual costs have been determined; (b) provide without cost to

the United States all lands, easements, rights-of-way, and spoil-disposal areas necessary for the construction of the project and for subsequent maintenance, when and as required; (c) provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms in accordance with plans approved by the Chief of Engineers; (d) accomplish without expense to the United States alterations as required for sewer, water supply, drainage, and other utility facilities as well as their maintenance; and (e) hold and save the United States free from damages due to construction and maintenance of the project. The net cost to the United States for the recommended plan of improvement is estimated at \$170,400 for construction and \$1,800 annually for maintenance.

4. After due consideration of these reports, I concur in the views and recommendations of the Board.

E. C. ITSCHNER,  
Major General, USA,  
Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

CORPS OF ENGINEERS, UNITED STATES ARMY,  
BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
Washington, D. C., April 29, 1958.

Subject: Red Wing Harbor, Minn.

To: The Chief of Engineers, Department of the Army.

1. This report is submitted in response to the following resolutions adopted March 24, 1956, and June 27, 1956, respectively:

*Resolved by the Committee on Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report of the Chief of Engineers on Red Wing Harbor, Minnesota, published as House Document Numbered 103, Seventy-sixth Congress, first session, with a view to determining whether any modification of the existing project should be made at the present time.*

*Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Red Wing Harbor, Minnesota, published in House Document No. 103, 76th Congress, 1st session, and other pertinent reports, with a view to determining whether any modification of the existing project should be made at this time, with particular reference to channel improvement for industrial harbor purpose.*

2. Red Wing, Minn., is on the right bank of the Mississippi River 67 miles below the head of the authorized 9-foot navigation channel at Minneapolis. The Federal projects serving Red Wing provide for a 9-foot channel in the Mississippi River, and a harbor for small boats. The Federal cost of the small-boat harbor, completed in 1947, was \$8,700 for new work. No maintenance has been required since its completion. Local interests in 1956, at a cost of \$64,400, dredged a channel 225 feet wide and 1,300 feet long creating a terminal area adjacent to the right bank of the river and west of the small-boat harbor. Private interests have constructed barge loading and unloading facilities along the waterfront.

3. Red Wing, with a population of about 11,000, serves the commercial needs of the surrounding agricultural area in Minnesota and Wisconsin. Its principal industries are the handling and shipping of grain; distribution of coal; milling of flour and feed; tanning of

leather; and manufacture of ceramics, shoes, marine engines, and building insulation. Coal comprises a large part of the annual tonnage of barged commodities handled over the existing municipal terminals. Grain storage and barge loading facilities, completed late in 1955, have resulted in a substantial annual movement of grain. Other commodities moving through the existing harbor are flour, vegetable oil, meal products, poles, and miscellaneous items.

4. Local interests desire enlargement of the industrial harbor, which they have provided, to permit expansion of the terminal facilities, relieve congestion at the riverfront terminals, and reduce the hazard to small craft using the small-boat harbor. They also desire that the Federal Government assume maintenance of the entire area in the new industrial harbor, including the area dredged by local interests. They have indicated their willingness and ability to meet the requirements of local cooperation.

5. The district engineer finds that the most suitable improvement to meet the needs of prospective commerce would consist of dredging, adjacent to the present harbor, an area of irregular shape, having an average width of 300 feet, an average length of 1,200 feet, and a depth of 9 feet. The dredged material would be placed along the south edge of the basin to raise about 18 acres of marshland to the level of extreme high water. Local interests would bear the costs in excess of those for normal spoil disposal, clear and grade the terminal site, provide surfacing for the access road, and extend a 36-inch culvert. The district engineer estimates the first cost of the improvement, based on September 1957 prices, at \$201,900; of which \$170,900 including \$500 for navigation aids, would be Federal; and \$31,000, including a cash contribution toward the initial construction cost equivalent to 2.3 percent of the Federal first cost, exclusive of the cost of navigation aids, presently estimated at \$4,000, would be non-Federal. The average annual carrying charges would be \$9,070 including \$1,800 for maintenance dredging of the proposed harbor area and the harbor previously dredged by local interests. The district engineer estimates the average annual benefits at \$12,460, consisting of \$11,880 for transportation savings on the movement of coal, scrap metal, and steel, and \$580 for land enhancement. The benefit-cost ratio is 1.37. He therefore recommends expansion of the industrial harbor at Red Wing in accordance with the plan outlined above, subject to certain conditions of local cooperation. The division engineer concurs.

6. The division engineer issued a public notice informing interested parties of the recommendations of the reporting officers, and giving them an opportunity to present additional information to the Board. In response thereto, local interests have furnished data showing that the present facilities are being used to capacity, and that the requested improvement is necessary for prospective commerce.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS  
AND HARBORS

7. The Board of Engineers for Rivers and Harbors concurs in the views and recommendations of the reporting officers. Increased commerce using the riverfront facilities has resulted in congestion in the movement of barges, and a lack of storage space for coal. Enlargement of the harbor which local interests have initiated will facilitate the handling of prospective commerce. The improvement proposed

by the district engineer is suitable and economically justified. The Board agrees with the reporting officers in the view that maintenance of the entire harbor should be assumed by the Federal Government.

8. The Board therefore recommends modification of the existing project for improvement of the Mississippi River between the Missouri River and Minneapolis, Minn., to provide for enlargement of the harbor at Red Wing, Minn., by dredging a basin, averaging 300 feet in width and 1,200 feet in length, at a depth of 9 feet below the project pool level, in an area west of the existing industrial harbor; all generally in accordance with the plans of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost of \$174,400 for construction and \$1,800 annually for maintenance of the entire industrial harbor; provided that, prior to construction, local interests agree to (a) contribute in cash 2.3 percent of the cost of construction, exclusive of lands and rights-of-way, facilities, and aids to navigation, and that such contribution, presently estimated at \$4,000, be paid in a lump sum prior to commencement of construction, the final allocation of cost to be made after actual costs have been determined; (b) provide without cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas necessary for the construction of the project and for subsequent maintenance, when and as required; (c) provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms in accordance with plans approved by the Chief of Engineers; (d) accomplish without expense to the United States alterations as required for sewer, water supply, drainage, and other utility facilities as well as their maintenance; and (e) hold and save the United States free from damages due to construction and maintenance of the project. The net cost to the United States for the recommended plan of improvement is estimated at \$170,400 for construction and \$1,800 annually for maintenance.

For the Board:

CHAS. G. HOLLE,  
*Major General, USA, Chairman.*

#### REPORT OF THE DISTRICT ENGINEER

##### SYLLABUS

The city of Red Wing, Minn. (1950 population, 10,645), has initiated an industrial harbor and terminal development in a marshy area along the right bank of the Mississippi River, 791.2 miles above the mouth of the Ohio River. Expansion of the harbor basin to permit the provision of suitable facilities for the handling of additional barge shipping is desired. The district engineer finds that the enlargement of the basin is justified by foreseeable tonnages of coal, steel, and scrap metals and recommends the construction of the proposed harbor expansion at an estimated first cost to the United States for new work of \$170,400 with an estimated annual maintenance cost of \$1,800, both exclusive of aids to navigation, subject to certain conditions of local cooperation.

UNITED STATES ARMY ENGINEER DISTRICT, ST. PAUL,  
CORPS OF ENGINEERS,  
*St. Paul, Minn., January 24, 1958.*

Subject: Review of Reports on Mississippi River Between the Missouri River and Minneapolis, Industrial Harbor at Red Wing, Minn.  
To: Division Engineer, United States Army Engineer Division, North Central, Chicago, Ill.

## AUTHORITY

1. This report is submitted in accordance with the following resolutions adopted March 24, and June 27, 1956, respectively:

*Resolved by the Committee on Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report of the Chief of Engineers on Red Wing Harbor, Minnesota, published as House Document Numbered 103, Seventy-sixth Congress, first session, with a view to determining whether any modification of the existing project should be made at the present time.*

and

*Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Red Wing Harbor, Minnesota, published in House Document No. 103, 76th Congress, 1st session, and other pertinent reports, with a view to determining whether any modification of the existing project should be made at this time, with particular reference to channel improvement for industrial harbor purpose.*

## SCOPE OF STUDY

2. Preparation of this report was authorized and directed by the Chief of Engineers on July 31, 1956. This report is based on detailed field surveys and borings made in April, May, and December, 1957, and January 1958.

## DESCRIPTION OF NAVIGATION CONDITIONS

3. The Mississippi River above Red Wing, Minn., drains an area of 46,680 square miles, the greatest portion of which lies in Minnesota, with small areas in Wisconsin, South Dakota, and Iowa. The maximum and minimum discharges at Red Wing are approximately 154,000 second-feet (in 1952) and 2,200 second-feet (in 1934), respectively. The corresponding stages were elevation 682.0<sup>1</sup> and elevation 661.6, respectively. The average discharge of the Mississippi at Red Wing for the period 1892 to 1937, inclusive, is estimated at 11,300 second-feet. High discharges occur in the period of March to July and occasionally in September or October. Low discharges are experienced normally in January and February and sometimes in August. Because of ice conditions, the river is closed to navigation approximately from December 1 to April 1 of each year. The section of river under consideration is 67 miles below the authorized head of the 9-foot channel at Minneapolis and 791 miles above the mouth of the Ohio River at Cairo, Ill. Red Wing is located near the upper end of the slack water pool created by lock and dam No. 4 at Alma, Wis., a unit of the 9-foot canalization project on the upper Mississippi River. Within the United States Army Engineer District, St. Paul, a depth of 9 feet is available in the Mississippi River at low water up to the lower dam at St. Anthony Falls in Minneapolis. Lock and dam No. 4 was placed in operation in June 1935 and since that time an elevation of at least 667.0 mean sea level (1912 adjustment) has been maintained at Red Wing. Local interests have constructed barge loading and unloading facilities for miscellaneous commodities along the waterfront. In

<sup>1</sup> All elevations mentioned in this report are in feet above mean sea level, 1912 adjustment.

1956 a channel 225 feet wide and 1,300 feet long at the eastern end of the projected industrial harbor was also dredged by local interests. See plate 1. A harbor for small craft lies between the existing municipal levee and the proposed new industrial harbor.

#### TRIBUTARY AREA

4. Red Wing, with a 1950 population of 10,645, serves the commercial needs of the surrounding rich agricultural area in Minnesota and Wisconsin and, for a city of its size, holds a prominent position in the field of manufacturing. Principal industries are the tanning of leather; the milling of flour and feed; the distribution of coal; the handling and shipping of grain; and the manufacture of sewer pipe, drain tile, pottery, shoes, marine engines, and building insulation. Red Wing is served by the main line of the Chicago, Milwaukee, St. Paul & Pacific Railroad; by a branch line of the Chicago Great Western Railway; and by Federal, State, and local highways. The planned replacement of an outmoded highway bridge on United States Highway No. 63 across the Mississippi River by a modern structure will do much to remove some restrictions on trade now existing with the tributary area in Wisconsin.

#### BRIDGES AFFECTING NAVIGATION

5. The existing bridge on United States Highway No. 63 (mile 790.6) was built in 1896. The fixed span over the navigation channel has a horizontal clearance of 417 feet between channel piers and a vertical clearance above 1952 high water of 52.2 feet. The bridge is narrow, has steep gradients on approaches, and is currently posted for a load limit of 12 tons. A permit for a new highway bridge to be constructed at mile 790.5 (downstream from the present bridge) by the States of Minnesota and Wisconsin was granted by the Secretary of the Army, October 23, 1956. The new structure will also be a fixed bridge with a horizontal clearance through the channel span of 420 feet and a vertical clearance of 49.95 feet above the 1952 high water. Approach grades will be moderate and the bridge will accommodate two lanes of traffic in each direction.

#### PRIOR REPORTS

6. The reports being reviewed are contained in House Document No. 103, 76th Congress, 1st session, which is the project document for the Red Wing Small-Boat Harbor. House Document No. 103 is, in turn, a review of House Document No. 290, 71st Congress, 2d session, and House Document No. 137, 72d Congress, 1st session. The two latter reports are the project documents for the upper Mississippi River 9-foot channel project.

#### EXISTING CORPS OF ENGINEERS PROJECT

7. The 9-foot channel navigation project provides for a channel of 9-foot depth at low water with widths suitable for long-haul, common carrier service from the mouth of the Missouri River to Minneapolis, Minn. The project was adopted by the River and Harbor Act approved July 3, 1930, modified by a House joint resolution ap-

proved February 24, 1932, and further modified by the River and Harbor Acts of August 30, 1935, August 26, 1937, March 2, 1945, and subsequent acts. Except for the extension of the channel in Minneapolis, the portion of the project within the United States Army Engineer District, St. Paul (Minneapolis to Guttenberg, Iowa) was practically completed in 1940. Federal costs within this district to June 30, 1956, total \$67,952,239 for new work and \$26,673,214 for maintenance and operation and care. The present approved annual cost of maintenance is \$4,060,000 for the entire 9-foot channel project above the mouth of the Missouri River. The Red Wing Small-Boat Harbor, lying just downstream from the proposed site of the commercial harbor, was authorized in 1945 and completed in 1947 at a cost of \$8,700. No maintenance has been undertaken.

#### LOCAL COOPERATION ON EXISTING AND PRIOR PROJECTS

8. No local cooperation was required for the existing 9-foot channel project. In connection with channel maintenance dredging, the city of Red Wing furnished a disposal area landward of a steel sheet-pile bulkhead which is immediately downstream from the small-boat harbor. This bulkhead, known as the municipal levee, is 475 feet long and serves as the river face of a commercial terminal of limited capacity.

9. In connection with the construction of the small-boat harbor, local interests were required to furnish, free of cost to the United States, all lands, easements, and rights-of-way and spoil-disposal areas for the initial work and for subsequent maintenance as required; hold and save the United States free from all claims for damages attributable to the dredging operations; and maintain suitable landing facilities, including a potable water supply, open to the general public on equal terms to all.

#### OTHER IMPROVEMENTS

10. Hay Creek enters the Mississippi River Valley near the westerly limits of Red Wing and discharges into the swamplands near the western end of the desired ultimate industrial harbor improvement. This creek carries a heavy burden of silt, part of which, in past years, has found its way into the bay which is now the site of the small-boat harbor. In order to prevent this silt from entering the bay, the city of Red Wing constructed a dike across these bottom lands about 2,800 feet west of the bay. The dike was constructed in the winter of 1937-38 at a cost of \$4,000. In the intervening years it has largely disappeared as a result of flood erosion. As noted earlier, local interests in 1956 dredged a channel 225 feet wide and 1,300 feet long and created a terminal area adjacent to the right bank and west of the small-boat harbor at a cost of \$64,400. (See pl. 1.) This is intended to serve expanded terminal needs on an interim basis pending development of the area to the west as proposed herein.

#### TERMINAL AND TRANSFER FACILITIES

11. In addition to the municipal levee (now used largely as a coal-docking area), private interests have constructed barge loading and

unloading facilities for grain, flour, and other bulk commodities along the waterfront. Using material dredged from the channel adjacent to the projected harbor described previously, an area east of the channel has been developed to augment and ultimately replace coal-handling facilities at the municipal levee. A steel sheet-pile bulkhead 60 feet long has been provided for unloading coal. The area reserved by the city for coal transfer and storage could, with fill and other development, handle up to 100,000 tons annually. Rail and highway facilities provide easy land access to the Red Wing Harbor area.

#### IMPROVEMENT DESIRED

12. At the public hearing held in Red Wing on October 1, 1956, which was attended by 31 persons representing navigation, transportation, and manufacturing interests, and local governmental officials and individuals, it was requested that the Federal Government participate in the development of a low-lying area west of the small-boat harbor for an enlarged industrial harbor and terminal area. It was pointed out that the great increase in traffic at the municipal levee and at the adjacent terminal of a grain company has created considerable congestion for barge handling which, in turn, constitutes a hazard for small craft entering and leaving the small-boat harbor.

13. It was stated that the city has acquired all property lying north of the Chicago, Milwaukee, St. Paul & Pacific Railroad Co. right-of-way to the north line between sections 24 and 25, T. 113 N., R. 15 W., and from the line of the Northern States Power Co. property near Jackson Street westerly to a point 660 feet west of the centerline of section 25 (shown on pl. 1) at a total cost of \$7,600 to provide the necessary area for the development. The channel at the eastern end of the area dredged by the city permits the utilization of the area between this channel and the small-boat harbor for coal handling. It is understood that it is the intention of the city that all future coal unloading and distribution will be handled here. Removing coal-handling operations from the municipal levee would permit enlargement of the grain storage and handling facilities of the grain company and thus reduce barge congestion in that area. The city intends to establish a new municipal terminal for the handling of miscellaneous commodities in the projected harbor improvement area.

#### EXISTING AND PROSPECTIVE COMMERCE

14. Coal has been, and is destined to be in the future, the most significant commodity moving through Red Wing Harbor. Over 90 percent of the river tonnage handled within the city limits since the resumption of river commerce in 1938 has been coal. Natural gas has been introduced in the Minnesota portion of the tributary area, but much of the hinterland could still be served profitably by barged coal through Red Wing because natural gas and coal for industrial purposes are now very nearly on a competitive price level in the region. It is pertinent to note that, although natural gas was piped into Red Wing in 1955, a marked increase in coal barged to Red Wing also occurred in that same year. Since that time coal receipts have averaged nearly 35,000 tons and space commitments by the city on the municipal terminal indicate that the tonnage will approach 50,000.

tons in 1958. With the existing state of development of the municipal terminal this tonnage is the maximum that can be accommodated annually. Two large coal producers and distributors operating through Red Wing Harbor have made surveys of the potential area which can profitably be served through Red Wing Harbor and their findings were virtually identical. The total consumption of the area is estimated to be 500,000 to 600,000 tons annually of which they believe at least a third could be handled through Red Wing. On this basis a volume of from 167,000 to 200,000 tons could be expected but, to be conservative, it is estimated that 160,000 tons would be handled annually. Although this represents a substantial increase over current tonnage, it is believed to be entirely capable of achievement particularly when it is realized that with the completion of the new highway bridge on United States Highway No. 63 a large industrial area in the Eau Claire, Wis., region will be much more susceptible to service by heavy coal trucks from Red Wing. Since the municipal terminal can be improved to accommodate a maximum of 100,000 tons of coal, the difference (60,000 tons annually) is assigned to the proposed improvement.

15. With the construction of the grain storage and barge loading facilities in 1955 by a grain company adjacent to the municipal terminal, a substantial volume of grain has been shipped to downriver ports by barge. Although completed late in the year, 60,000 tons were shipped in 1955 and 92,000 tons were shipped in 1956. The grain company is interested in obtaining more dockage space to permit the installation of additional loading facilities and it is understood that the provision of adequate terminal space for coal and other commodities in the proposed harbor area will permit the granting of additional municipal levee frontage to the grain company. Since the foreseeable needs of the grain company will be met without direct employment of the proposed harbor area and since no other grain company has indicated an interest in the Red Wing area as a terminal site, it is evident that little commerce in grain need be anticipated through the proposed harbor.

16. The barge shipment of flour is also of significance at Red Wing. A milling company is favorably situated just above the existing highway bridge so that loading can be accomplished by belt conveyor directly from the mill into barges. Starting in 1954 with a downriver shipment of 1,500 tons the movement grew to 7,180 tons in 1956 and a movement of over 20,000 tons is indicated for 1957. However, since there is no plan extant for utilizing the proposed harbor for this movement and since no other milling company is apparently interested in establishing a Red Wing terminal, it follows that little commerce in flour may be expected through the proposed harbor.

17. Other commodities which have moved through the existing harbor are grains, vegetable oil and meal products, poles, and miscellaneous items. None of these have attained significant tonnage and there is no reason to expect that the proposed harbor will alter this situation.

18. A number of commodities have been suggested as potential commerce for the proposed harbor including blast furnace slag (for rock wool manufacture), sulfur (for paper and rubber manufacture), linseed oil, carbon black (for rubber manufacture), petroleum, and port-

land cement. All of these were investigated but no significant potential tonnage was apparent.

19. There are, however two commodities which appear to be of substantial importance for the proposed harbor. A firm at Eau Claire, dealing in scrap metal and finished steel products, has been searching for a river terminal site and would utilize the Red Wing harbor if an adequate terminal area were available. Their needs include a storage area of 5 to 6 acres and a river frontage of about 600 feet. There is no other site along the river where their harbor needs can be satisfied at present and since the existing municipal terminal is to be utilized for coal alone, the proposed harbor expansion constitutes their only reasonable means of establishing river dockage facilities. Based on present activities of the company, it is estimated that about 17,000 tons of scrap would be shipped through the proposed harbor from the Eau Claire area. Further, with a base at Red Wing it is expected that an additional 5,000 tons of scrap could be collected from the area in Minnesota tributary to Red Wing for outshipment by barge. For fabrication at the Eau Claire plant the company expects that from 8,000 to 15,000 tons of steel bars, shapes, and rods would be shipped into Red Wing by barge.

20. On the basis of the above it is considered that the following potential tonnages are conservative and realistic for the proposed harbor:

	<i>Tons</i>
(a) Coal.....	60,000
(b) Scrap from Eau Claire area.....	17,000
(c) Scrap from Red Wing area.....	5,000
(d) Fabricated steel.....	10,000
Total.....	92,000

#### VESSEL TRAFFIC

21. It is anticipated that the industrial harbor considered herein would be used by the standard towboats now operating on the upper Mississippi River. They vary in size up to a length of about 230 feet, a width of 58 feet, and a draft of about 8.6 feet. Regular upper Mississippi River cargo barges ranging in size from 126 by 33 feet to 300 by 48 feet, drawing from 6 to 9 feet, and carrying from 500 to 3,000 tons would be expected to use the improvement. However, it is most probable that only one or two barges in any single tow would be consigned to Red Wing so that barges destined for other ports would be moored in the vicinity while the towboat shuttled one or two barges into the proposed industrial harbor.

#### DIFFICULTIES ATTENDING NAVIGATION

22. At present the main difficulty experienced by commercial traffic at Red Wing is the congestion of barges which exists in the immediate vicinity of the municipal levee and the grain company terminal. Considerable shifting and shuttling of barges is necessary during loading and unloading operations. With the removal of the coal activities to the proposed harbor and the expected expansion of grain activities into the present municipal levee frontage it may be expected that the congestion would be largely eliminated.

## SPECIAL SUBJECTS

23. The mouth of Hay Creek lies in the marshy area which will become the harbor and terminal proposed herein. As noted earlier the creek carries a heavy load of sediment and considerable deposition takes place in the vicinity. A fairly well-defined channel now exists which reaches the Mississippi at some distance from the initial portion of the harbor as proposed and it is not anticipated that any appreciable silt deposition from this source will occur. However, if and when the ultimate stage of the harbor is developed care should be taken to provide positive assurance that the creek will not find its way into the harbor basin.

## PLAN OF IMPROVEMENT

24. *General description.*—The plan of improvement proposed herein envisions a harbor basin and terminal in an area west of the existing small-boat harbor which would be an extension of a narrow basin created by dredging with Red Wing city funds. The area is adjacent to the main channel of the Mississippi River and constitutes the most logical location for a harbor and terminal development in the vicinity of Red Wing. The plan would provide a basin and terminal facilities which are adequate and consistent with the expected tonnage and benefit therefrom.

25. *Harbor basin design.*—The size of the harbor basin was determined from consideration of maneuverability of barge tows and the provision of adequate frontage for loading and unloading of barges. It would have a minimum width of 225 feet and an average length of about 1,200 feet. The depth provided would be 9 feet below project pool or to elevation 658.0 plus overdepth. The entire industrial harbor, including the entrance and narrow basin constructed by local interests, would be maintained by the Federal Government.

26. *Terminal facilities.*—(a) Limited boring data shown on plate 2 indicate that highly compressible soils exist in the proposed general terminal area and that a large proportion of fill materials to be placed in this general area consists of unstable and highly compressible soils. Foundation conditions should be carefully investigated by borings prior to construction of any structures and buildings in this area and prior to the use of any specific local area for heavy stockpiling of bulk materials.

(b) Borings made in the proposed harbor area reveal that two-thirds of the material to be dredged consists of unstable organic and inorganic clays with high compressibility indexes, and it is proposed that these soils be deposited at the southern extremity of the terminal area which lies south of the south edge of the harbor basin. (See pl. 1.) The remaining third of the material consists of wet silty sand (containing shells); sandy silt, and silt. It is anticipated that these materials will be somewhat unstable after being placed in the proposed terminal area until such time as the free pore water is drained by seepage from the fill. These materials would be placed immediately adjacent to the harbor basin. Local interests are aware of the nature of the soils to be encountered and do not plan to use the terminal for heavy loading. If heavy structures are needed, they anticipate the need for piles.

(c) All costs in excess of normal costs for spoil disposal would be borne by local interests. The estimate of cost in table 1 and appendix A reflect this situation. In addition to the grading of the terminal area, local interests would be required to clear the terminal site (outside of the area to be dredged), provide surfacing for the access roadway, and extend a 36-inch culvert, all of which are considered to be non-self-liquidating items.

#### REQUIRED AIDS TO NAVIGATION

27. A study of the proposed harbor made by the United States Coast Guard indicates the need for 2 battery-operated flashing lights, 1 on each side of the entrance channel.

#### ESTIMATES OF FIRST COST

28. The estimates of first cost of the proposed improvement, based on September 1957 price levels, are summarized in table 1 and are itemized in detail in appendix A. The unit prices were determined after consideration of current costs for similar work and material in this district, adjusted to meet local conditions. The amounts shown include allowances for contingencies. No interest during construction is included since the period of construction would be less than 1 year.

TABLE 1.—*Estimates of first cost*

Federal first cost:	
Channels:	
Clearing .....	\$1, 150
Dredging .....	145, 350
Total contract cost .....	146, 500
Government costs:	
Engineering and design .....	10, 900
Supervision and administration .....	17, 000
Total Government costs .....	27, 900
Total construction costs .....	174, 400
Local cash contribution .....	-4, 000
Net construction costs (Corps of Engineers) .....	170, 400
Aids to navigation (U. S. Coast Guard) .....	500
Total Federal first costs .....	170, 900
Non-Federal first cost:	
Facilities .....	24, 000
Lands and rights-of-way .....	3, 000
Local cash contribution .....	4, 000
Total non-Federal first cost .....	31, 000
Total Federal and non-Federal first cost .....	201, 900

#### ESTIMATES OF ANNUAL CHARGES

29. Estimated annual charges are shown in table 2. Federal annual maintenance would include periodic dredging of the entire industrial harbor as required to maintain project depth. Amortization has been computed assuming an economic life of 50 years.

TABLE 2.—*Estimates of annual charges*

Federal annual charges:	
Interest, \$170,900 at 2.5 percent.....	\$4,270
Amortization, \$170,900 at 1.026 percent.....	1,750
Maintenance dredging (entire harbor).....	1,800
United States Coast Guard maintenance.....	150
<b>Total Federal annual charges.....</b>	<b>7,970</b>
Non-Federal annual charges:	
Interest, \$31,000 at 2.5 percent.....	780
Amortization, \$31,000 at 1.026 percent.....	320
<b>Total non-Federal annual charges.....</b>	<b>1,100</b>
<b>Total Federal and non-Federal annual charges.....</b>	<b>9,070</b>

## ESTIMATES OF BENEFITS

30. As indicated under "Existing and Prospective Commerce" coal is the most significant potential commodity for the proposed harbor. Further, as developed therein it is estimated that 60,000 tons annually would be handled through the proposed harbor. On the basis of information obtained from the coal handlers it is expected that roughly 60 percent of this coal would be distributed in Wisconsin (with the completion of the new bridge) and 40 percent would be distributed in Minnesota.

31. The coal companies now operating through Red Wing Harbor have made extensive investigations of terminal sites which might serve their needs in the area and, although no site other than Red Wing was found to possess all the features desired, it has been assumed for the purposes of this report that terminal sites could be developed at St. Paul by dredging and by filling marshy areas. St. Paul is therefore considered as an alternative port for the evaluation of transportation savings.

32. Most of the coal which would be consumed in the area would originate from southern Illinois. It may be assumed that terminal charges at both Red Wing and St. Paul are identical. Further, truck distances from both cities to centers of coal consumption are approximately the same. Thus, the saving which can be achieved by utilizing a terminal at Red Wing would be the reduction in cost of river transportation over the distance of 45 miles between Red Wing and St. Paul. It has been determined that variable line haul costs on the upper river on coal are about 3 mills per ton-mile. Applying this unit cost to the additional mileage to St. Paul (45 miles) and the tonnage indicated above (60,000 tons) yields an average annual benefit for coal of \$8,100 annually.

33. The movement of scrap metals on the river would also be handled by contract carriers and the evaluation of savings would be similar to that for coal. It has been determined that the cost of moving scrap on the upper Mississippi is about 2 mills per ton-mile and applying this unit to the added distance of 45 miles and the indicated tonnage (22,000) yields a benefit of \$1,980 annually.

34. Following a similar analysis for steel it was determined that a reasonable upbound cost for steel products would be about 4 mills per ton-mile. Applying this unit to the distance and the tonnage (10,000) yields a benefit of \$1,800.

35. As a result of the dredging of the harbor proposed herein there would be approximately 18 acres of land, the elevation of which would be raised to the level of the highest flood of record. This land is adjacent to the railroad right-of-way and is easily accessible from the highway. Thus, it would experience an appreciation in value even though access to the river were not available. The appreciated value is estimated at about \$900 per acre or a total of \$16,200. On the basis of an estimate of first cost of \$100 per acre for the terminal development proposed herein, the net appreciation would be \$14,400. Assuming a rate of return on investment of 4 percent, the annual enhancement would be about \$580.

36. A summary of apparent benefits follows:

Coal.....	\$8,100
Scrap.....	1,980
Steel.....	1,800
Land enhancement.....	580
Total (annually).....	12,460

#### COMPARISON OF BENEFITS AND COSTS

37. In preceding paragraphs annual costs have been estimated for a project as outlined under "Plan of Improvement" as \$9,070. Further, benefits which might be expected if such a project were constructed are estimated as \$12,460 annually. These values yield a favorable benefit-cost ratio of 1.37. This ratio is based on the assumption that the proposal is unrelated to the beginnings of the harbor which were financed entirely by the city of Red Wing. If the costs incurred by the city (\$64,400) are reduced to an annual basis and if the benefits of an additional 100,000 tons of coal are included in the analysis, the benefit-cost ratio would be 2.29 for the overall improvement.

#### PROPOSED LOCAL COOPERATION

38. In accordance with existing policy for commercial navigation projects local interests would be required to (a) provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project and for subsequent maintenance when and as required; (b) hold and save the United States free from damages due to the construction and maintenance of the project; (c) provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms in accordance with plans approved by the Chief of Engineers; (d) accomplish without expense to the United States alterations as required for sewer, water supply, drainage and other utility facilities as well as their maintenance; and (e) furnish a cash contribution equivalent to 2.3 percent of the first costs of the project exclusive of lands and rights-of-way, facilities, and aids to navigation. This contribution, currently estimated as \$4,000, is necessary in view of the enhancement of lands which is expected to accrue (see appendix B) and is a benefit which is essentially local in character.

#### APPORTIONMENT OF COSTS AMONG INTERESTS

39. As indicated under "Proposed local cooperation" above, local interests would be obliged to provide lands for the terminal and for

the harbor basin, provide terminal and transfer facilities, accomplish necessary utility alterations, and furnish a cash contribution equal to 2.3 percent of the initial Federal construction costs. The total cost of these items of work is estimated as \$31,000. Federal costs include the principal construction items (less cash contribution) which are estimated as \$170,400 and the United States Coast Guard navigation aids which are estimated as \$500, for a total of \$170,900.

#### COORDINATION WITH OTHER AGENCIES

40. In the progress of the investigation a number of meetings were held with local interests to determine their views on the project and to acquaint them with the features of the project as proposed. The State of Minnesota Department of Conservation and the Department of Business Development were consulted regarding the proposed project and these agencies indicated their general approval of the project. Federal agencies consulted included the United States Coast Guard and the United States Fish and Wildlife Service. The Coast Guard suggested the inclusion of navigation aids as provided in the cost estimate and the United States Fish and Wildlife Service indicated that there appeared to be nothing of a serious detrimental nature to wildlife which would result from the proposed project. It has been ascertained that the city of Red Wing possesses the ability and willingness to meet the requirements of local cooperation as stated herein.

#### DISCUSSION

41. Since 1938, with the virtual completion of the 9-foot channel project, the city of Red Wing has resumed its earlier position as an important river terminal. The principal import during this more recent period has been coal but since 1955 the export of grain has also been significant. Further, the shipment of flour from the city waterfront has increased very markedly within very recent years. All of these activities have created a congested waterfront and additional terminal facilities are seriously needed. In 1956 the city, recognizing the seriousness of the need, acquired property and dredged a channel (at a cost of about \$65,000) which provided substantial additional terminal space primarily for coal. This development was intended to be the initial stage of a much larger harbor development, and in this connection it is apparent that the cost of the harbor development to the Federal Government has been materially reduced.

42. The city of Red Wing is favorably situated to serve the area lying within 100 miles of the city east and west of the river. The ability of the city to serve as a market for the Wisconsin side of the river has been somewhat restricted by an existing highway bridge which has difficult approaches and a severe load restriction. The construction of a new highway bridge just downstream from the existing structure, assured by 1962, will do much to facilitate the serving of the Wisconsin region, particularly with respect to bulk commodities such as coal, grain, and steel products, through Red Wing. The estimate of the commerce which may be reasonably expected to be handled through the proposed harbor includes 60,000 tons of coal (in excess of the 100,000 tons which is the maximum which could be handled with the existing facilities if fully developed), 22,000 tons of scrap metals, and 10,000 tons of steel products.

43. The improvement proposed would provide an enlargement of an existing harbor basin. The expansion area would be irregular in shape having a minimum width of 225 feet and averaging about 1,200 feet in length. The harbor depth would provide 9 feet of water below project pool elevation plus overdepth. The dredged material would be placed along the south edge of the basin and would be used to raise about 18 acres of marshland to the level of extreme high water. The city has already acquired sufficient property so that the harbor could ultimately be expanded to a total length of more than 3,200 feet and a width of 800 feet. Estimated initial costs for the expansion proposed at this time are \$170,400 Federal (exclusive of aids to navigation) and \$31,000 non-Federal. Annual charges including maintenance amount to \$7,970 Federal and \$1,100 non-Federal, for a total of \$9,070.

44. An analysis of the transportation savings which might be effected by the development of the proposed harbor reveals that a saving in barge transportation costs could be effected by a reduction in distance over that to the nearest reasonable alternative port (St. Paul) of about 45 miles. A benefit due to land enhancement would also be realized. Total annual benefits evaluated on the assumption that the improvement is unrelated to the existing harbor are estimated as \$12,460 annually which when compared to costs result in a favorable benefit-cost ratio of 1.37. A benefit-cost ratio of 2.29 results if the benefits and costs for the entire harbor are considered. Local interests have indicated their willingness and ability to conform to the requirements of local cooperation and no objections have been voiced to the project by appropriate State or Federal agencies.

#### CONCLUSIONS

45. It is concluded that the most suitable plan for the expansion of the industrial harbor at Red Wing is the plan proposed herein of dredging a basin averaging 300 feet in width and 1,200 feet in length in the area west of the existing industrial harbor.

#### RECOMMENDATIONS

46. It is recommended that a project for the expansion of the industrial harbor at Red Wing having a basin averaging 300 feet in width and 1,200 feet in length and having a depth of 9 feet below project pool level be constructed in an area west of the existing industrial harbor at estimated costs to the United States of \$170,400 for new work and \$1,800 for annual maintenance of the entire industrial harbor, both exclusive of navigation aids, subject to the conditions that responsible local interests will furnish the following cooperation: (a) provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project and for subsequent maintenance when and as required; (b) hold and save the United States free from damages due to the construction and maintenance of the project; (c) provide and maintain at local expense adequate public terminal and transfer facilities open to all on equal terms in accordance with plans approved by the Chief of Engineers; (d) accomplish without expense to the United States altera-

tions as required for sewer, water supply, drainage and other utility facilities as well as their maintenance; and (e) furnish a cash contribution equivalent to 2.3 percent of the first costs of the project exclusive of lands and rights-of-way, facilities, and aids to navigation.

DESLOGE BROWN,  
Colonel, Corps of Engineers,  
District Engineer.

[First endorsement]

OFFICE, DIVISION ENGINEER,  
UNITED STATES ARMY ENGINEER DIVISION, NORTH CENTRAL,  
Chicago, Ill., February 18, 1958.

Subject: Review of reports on Mississippi River between the Missouri River and Minneapolis, industrial harbor at Red Wing, Minn.

To: Chief of Engineers, Department of the Army, Washington, D. C.

The division engineer concurs in the recommendation of the district engineer.

LOUIS J. RUMAGGI,  
Major General, United States Army,  
Division Engineer.

APPENDIX B.—DETERMINATION OF LOCAL CASH CONTRIBUTION

COST ALLOCATION ANALYSIS

In accordance with existing law, local interests would be required to provide the necessary lands and rights-of-way for the harbor and terminal or disposal area and to make any necessary alterations or relocations of affected utilities. In addition, where land enhancement benefits are anticipated as a result of the proposed improvements, existing policy requires a contribution (in cash or equivalent work) equal to the proportion of the first cost of general navigation facilities (Federal construction costs) determined by the ratio of local to total benefits, which, in turn, is determined on the assumption that transportation savings are entirely a general benefit while land enhancement benefits are half general and half local. The determination of the cost sharing required is given in the following tabulation:

Federal construction costs.....				\$174,400
Project benefits:		<i>Total</i>	<i>General</i>	<i>Local</i>
Transportation savings.....	\$11,880	\$11,880		
Land enhancement.....	580	290	\$290	
Total.....	12,460	12,170	290	
Percent.....	100.0	97.7	2.3	

2.3 percent of \$174,400 equals \$4,011, say \$4,000.

