

YAQUINA BAR, BAY, AND HARBOR, OREG.

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L E T T E R

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS ON  
PRELIMINARY EXAMINATION AND SURVEY OF YAQUINA BAR,  
BAY, AND HARBOR, OREG., INCLUDING CONSIDERATION OF ANY  
PROPOSITION FOR COOPERATION OF LOCAL INTERESTS.

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MAY 2, 1917.—Referred to the Committee on Rivers and Harbors and ordered to be  
printed, with illustrations.

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WAR DEPARTMENT,  
*Washington, May 1, 1917.*

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, of yesterday's date, together with copy of a report from Maj. Arthur Williams, Corps of Engineers, dated October 8, 1915, on a preliminary examination of Yaquina Bar, Bay, and Harbor, Oreg., made by him in compliance with the provisions of the river and harbor act approved March 4, 1915; also copy of a report from Maj. H. C. Jewett, Corps of Engineers, dated January 17, 1917, with maps, on a survey, made by him in compliance with the provisions of the above-mentioned act, and an item in the river and harbor act approved July 27, 1916.

Very respectfully,

NEWTON D. BAKER,  
*Secretary of War.*

WAR DEPARTMENT,  
OFFICE OF THE CHIEF OF ENGINEERS,  
*Washington, April 30, 1917.*

From: The Chief of Engineers, United States Army.

To: The Secretary of War.

Subject: Preliminary examination and survey of Yaquina Bar, Bay, and Harbor, Oreg.

1. There are submitted herewith, for transmission to Congress, report dated October 8, 1915, by Maj. Arthur Williams, Corps of Engineers, on preliminary examination authorized by the river and harbor act approved March 4, 1915, of Yaquina Bar, Bay, and Harbor, Oreg., and report dated January 17, 1917, with maps, by Maj. H. C. Jewett, Corps of Engineers, on survey covered by the above-mentioned item, and also the item in the river and harbor act approved July 27, 1916, for "Yaquina Bay and Harbor, Ore., including consideration of any proposition for cooperation of local interests."

2. Yaquina Bay is a tidal estuary on the Oregon coast about 115 miles south of the mouth of Columbia River. It is about 3 miles in length, and at its upper end near the town of Yaquina it receives the flow of the Yaquina River. Under an appropriation made in 1880, work was commenced by the United States in 1881 on the improvement of the entrance by the construction of jetties. These jetties were completed in 1895, and resulted in securing a channel across the bar with a controlling depth at mean lower low water of from 10 to 14 feet. Including the removal of several rocks from the outer bar, the total cost of improvement by the United States was about \$715,000. Under the provisions of the river and harbor act of March 3, 1905, the project was discontinued and the unexpended balance was returned to the Treasury. At the time of the recent survey the controlling depth on the outer bar was found to be 15 feet at mean lower low water. About 2,000 feet inside the jetties is an inner bar with a depth of 17 feet, and just above the town of Newport there is a shoal of considerable extent having a depth of 17 feet at mean lower low water. The mean range of tide at the entrance is 7.2 feet. The commerce of the bay for 1914, is reported at 18,241 tons, of which 12,394 tons consisted of lumber. The district officer states that the great resource of the region is the timber of the Siletz Valley, which lies from 10 to 20 miles to the north, and which is reported to contain 15 to 18 billion feet board measure of timber. Since the Siletz Indian Reservation has passed into private ownership, this timber has become available for market and local interests are desirous of securing increased channel depth up to the railroad terminus at Yaquina, in order to provide an outlet for this timber. The district officer presents a plan of improvement contemplating the extension of the south jetty, 2,200 feet, the restoration and extension of the north jetty, 1,400 feet, the construction of a spur jetty about 800 feet long, and dredging and rock removal to secure a depth of 20 feet at mean lower low water through the entrance, and thence 18 feet up to the railroad terminus at Yaquina. The estimated cost of this work is \$836,000, and \$5,000 annually for maintenance of the inner channel. The district officer regards the locality as worthy of improvement to this extent, provided local interests contribute 50 per cent of the first cost of the project, which they have offered to do. The division engineer concurs in the views of the district officer.

3. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated February 27, 1917, concurring in the views of the district officer and the division engineer.

4. After due consideration of the above-mentioned reports, I concur in the views of the district officer, the division engineer, and the Board of Engineers for Rivers and Harbors, and therefore report that the further improvement by the United States of Yaquina Bay and Harbor, Oreg., is deemed advisable under the plan proposed by the district officer contemplating the extension of the south jetty 2,200 feet, the restoration and extension of the north jetty 1,400 feet, the construction of a spur jetty about 800 feet long, and dredging and rock removal to secure a depth of 20 feet at mean lower low water through the entrance, and thence 18 feet up to the railroad terminus at Yaquina, all at an estimated cost of \$836,000 for first construction and \$5,000 annually for maintenance; provided that before work is undertaken by the United States local interests shall contribute the sum of \$418,000 toward the cost of the improvement. The first appropriation should be \$100,000, and the balance to be furnished by the United States, \$318,000, should be appropriated so as to complete the work in about four years.

W. M. BLAOK, *Brigadier General.*

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REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS  
ON SURVEY.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
*February 27, 1917.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the district officer's reports authorized by the river and harbor act of March 4, 1915, on preliminary examination and survey of Yaquina Bar, Bay, and Harbor, Oreg., and by the river and harbor act of July 27, 1916, on preliminary examination and survey of Yaquina Bay and Harbor, Oreg., including consideration of any proposition for cooperation of local interests. As these two items are apparently identical in purpose, the report on survey covers both of them.

2. Yaquina Bay is a tidal estuary on the Oregon coast about 115 miles south of the mouth of the Columbia River. The bay is about 3 miles long and somewhat over a mile in width at its widest place. It is entered at its eastern end by the Yaquina River near the mouth of which is the settlement of Yaquina. In the upper part of the bay there is a depth of from 18 to 30 feet for a width of 300 to 800 feet, affording good anchorage. The original depth over the bar was 7 to 9 feet. This has been increased through the construction of jetties to 11 feet at mean lower low water in August, 1915, and to 15 feet in 1916. There is a bar just inside the jetties and another just above Newport, over which there is a controlling depth of 17 feet. The mean range of tide at the entrance is 7.2 feet.

3. Under the original and modified projects two converging jetties were constructed and certain submerged rocks removed at a total cost of about \$715,000. The jetties were completed in 1895. As a result of an examination made in 1903, the improvement was shortly afterward abandoned and available funds reverted to the Treasury. There is no existing project.

4. The town of Newport is located near the entrance and has a permanent population of about 700. Yaquina near the mouth of the river is but a small settlement. Toledo, the county seat, with a population of about 800, is situated at the mouth of Depot Slough, a short distance above the mouth of the river. Lumbering is the principal industry, although stock raising and dairying are becoming important factors in the development of this section. The commerce reported for 1914 amounted to 18,241 tons, valued at \$548,600. Of this the principal item was lumber, amounting to 12,394 tons. The improvement desired is stated to be the restoration and extension of the jetties, the object apparently being greater depth so as to permit the use of larger vessels.

5. The district officer presents a plan of improvement with a view to securing a depth of 20 feet at mean lower low water through the entrance and 18 feet up to the railroad terminus at Yaquina. The work involves the extension of the south jetty 2,200 feet; the restoration and extension of the north jetty 1,400 feet; a spur jetty about 800 feet long; and dredging and rock removal. The estimated cost of this work is \$836,000, and \$5,000 annually for maintenance of the inner channel.

6. The district officer calls attention to the passing of the Siletz Indian Reservation into private ownership and states there is from 15 to 18 billion feet of timber tributary to Yaquina Bay. He regards the locality as worthy of improvement to the extent outlined above, provided local interests contribute 50 per cent of the first cost of the project. The division engineer concurs in the views of the district officer.

7. The commerce of this locality has never been large, as it has consisted principally of lumber, carried necessarily in light-draft vessels. Conditions have been changed materially by the opening of the Siletz Indian Reservation, which results in making available for market a very large amount of timber. The valley lands are being devoted to stock raising and dairying purposes, which should induce increased population and consequently a larger general commerce. Local interests show their faith in the future of the locality by an offer of liberal cooperation. In view of all the circumstances, the board concurs with the district officer and the division engineer in the opinion that it is advisable for the United States to undertake the further improvement of Yaquina Bar, Bay, and Harbor, as proposed by the district officer, at an estimated cost of \$836,000, and \$5,000 annually for maintenance, provided that before work is begun local interests shall contribute \$418,000 toward the cost of the work. The first appropriation by the United States should be \$100,000, and the balance should be appropriated so as to complete the work in about four years.

8. In compliance with law the board reports that, except as contemplated by the above recommendations, there are no questions of

terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

FREDERIC V. ABBOT,  
*Colonel, Corps of Engineers,  
Senior Member of the Board.*

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PRELIMINARY EXAMINATION OF YAQUINA BAR, BAY, AND HARBOR,  
OREG.

UNITED STATES ENGINEER OFFICE, FIRST DISTRICT,  
*Portland, Oreg., October 8, 1915.*

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army  
(Through the Division Engineer).

Subject: Preliminary examination of Yaquina Bar, Bay, and Harbor,  
Oreg.

1. In compliance with department letter of March 15, 1915, I have to submit the following report on a preliminary examination of Yaquina Bar, Bay, and Harbor, Oreg., made in accordance with the provisions of the river and harbor act of March 4, 1915.

2. The examination was made in August, 1915, by Mr. J. S. Polhemus, assistant engineer.

GENERAL DESCRIPTION.

3. Yaquina Bay is a tidal estuary on the Oregon coast, about 115 miles south of the mouth of Columbia River and 530 miles north of San Francisco Bay, Cal. The bay is about 3 miles long and somewhat over a mile in width at its widest place. It narrows at its eastern end to about one-half a mile, near Yaquina, about 4 miles from the bar, where it is entered by the Yaquina River, a small stream which varies in width from about 2,000 feet at its mouth to about 150 feet at the junction with Big Elk River, 17 miles above. Several sloughs enter this portion of the waterway, which is more of a tidal estuary than a river. The tidal influence extends nearly undiminished to the mouth of Big Elk River, and gradually decreasing to a point about 5 miles above.

4. Yaquina River proper is a small mountain stream, with stable banks and bed, not navigable at any stage above the head of tide. It rises in the Coast Range of mountains in Lincoln County, 30 miles from the sea in a direct line, and flows westerly with a considerable fall into Yaquina Bay. It has a very limited watershed and consequent small flow. Freshets of no very great magnitude occur during the rainy season of the winter.

5. The bay channel, from McLeans Point to just above Yaquina, for about  $2\frac{1}{2}$  miles, ranges in width from 300 to 800 feet and varies in depth from 18 to 30 feet at mean lower low tide. It affords good anchorage for moderate-sized vessels.

6. The tidal area of the bay and its tributaries is about 5 square miles. The mean rise of the tide at the bar above the plane of mean lower low water is 7.2 feet. The extreme range varies from 5 to 11 feet, depending on winds and seasons. The tidal range is practically the same up past Oysterville. The bay has a mean discharge of about 40,000 cubic feet per second, nearly all tidal.

7. The ocean bar is of fine gray sand overlying for an uncertain depth a reef of soft argillaceous sandstone. Since several pinnacle rocks were removed from the bar channel in 1901 and 1902, it is believed that no point of the underlying ledge within the limits of the bar channel lies above a plane of 12 feet below mean lower low water and as a controlling depth of as much as 15 or 16 feet has been reported in the bar channel at times and a previous boring survey showed that a depth of rock of 18 or 19 feet at mean low tide would obtain if the sand were removed, it is thought that a complete set of borings would probably demonstrate that in certain locations the underlying ledge would not interfere with a channel of reasonable depth if the overlying sand were scoured away. Originally, before works of improvement were undertaken, the bar was crossed by three shifting narrow channels, with a best obtainable depth at low water of from 7 to 9 feet. Now, since the jetties were completed in 1895, there is usually only one channel, in which the controlling depth at mean lower low water was found to be 11 feet in August, 1915. The channel runs seaward from between the ends of the jetties in a westerly direction.

8. At a distance of about a mile to seaward is a reef of rocks approximately parallel to the shore, having from one to several fathoms of water over it. There are several gaps in the reef free from obstructions. A wide opening nearly opposite the entrance to the bay gives easy entrance to vessels. Between the reef and the outer edge of the bar the channel is about one-fourth of a mile wide, with low-water depths of from 4 to 6 fathoms. Outside the reef the depth increases rapidly seaward. This reef partially protects the entrance by first breaking somewhat the heavy storm seas, thus reducing the size of the breakers on the bar.

9. The United States Coast and Geodetic Survey surveyed the locality in 1868 (Chart No. 6057), and resurveyed the bar and river to Toledo in 1914. The results of this last survey have not been published.

#### PREVIOUS EXAMINATIONS AND SURVEYS.

10. Yaquina Bay has been the subject of several previous examinations and surveys, as follows:

Preliminary examination and survey of Yaquina Bay, Oreg., in 1879, by Col. G. L. Gillespie, Corps of Engineers. On June 14, 1880, \$40,000 was appropriated and a project was prepared for improvement by closing the south channel by a jetty 2,500 feet long on the south side of the entrance and to open and maintain the central channel with a depth of water on the bar of not less than 17 feet at high tide. (Ex. Doc. No. 148, 46th Cong., 2d sess.)

Special report on improvement of Yaquina Bay, made January 13, 1890, by Capt. Thomas W. Symons, Corps of Engineers. Estimated cost of completing improvement, \$370,560.30. (Ex. Doc. No. 47, 51st Cong., 1st sess.)

Special report on improvement of Yaquina Bay, made December 11, 1880, by Col. G. L. Gillespie, Corps of Engineers. Favorable recommendation for jetty construction at an estimated cost of \$35,750. (Ex. Doc. No. 30, 52d Cong., 1st sess.)

Preliminary examination of harbor at Yaquina, with a view to obtaining 25 feet of water at mean low water upon the bar entrance. Made in 1892, by Maj. W. H. Heuer, Corps of Engineers. Report unfavorable. (Ex. Doc. No. 96, 52d Cong., 2d sess.)

Preliminary examination of Yaquina Bay, Oreg., for increased depth, made in 1895 by Capt. Thomas W. Symons, Corps of Engineers. Report unfavorable (Ex. Doc. No. 227, 53d Cong., 3d sess.)

Preliminary examination of Yaquina Bay, Oreg., with a view to a project for deeper water, made by a board of engineers appointed by the President of the United States. A project was submitted by the board for extending the north jetty 2,100 feet and the south jetty 2,200 feet with groins 100 feet long at intervals of 300 feet, and an additional spur to be built 800 feet long from the south jetty near its root, and removal of 2 detached rocks in the track of vessels about 2,000 feet outside the ends of the present jetties, at an estimated cost of \$1,025,000. Pursuant to the above report the river and harbor act of June 3, 1896, appropriated \$25,000 for constructing the improvement, and provided that contracts may be entered into for its completion as recommended by the board, the total liabilities incurred not to exceed \$1,000,000, exclusive of the amount therein and heretofore appropriated (H. Doc. No. 68, 54th Cong., 1st sess.).

Special report of examination of improvement of Yaquina Bay, Oreg., made in 1899 by a Board of Officers. Unfavorable, except as to removal of a cluster of detached rocks at an estimated cost of \$20,000 (H. Doc. No. 110, 56th Cong., 1st sess.).

Special report of board of engineers, dated September 26, 1903, was referred to the Board of Engineers for Rivers and Harbors, which reported that in its opinion it was not desirable for the United States to continue the improvement at that time except for removal of rocks and maintenance for a period of 2 years (H. Doc. No. 158, 58th Cong., 2d sess.).

Preliminary examination of Yaquina Bay and Bar entrance in 1912, by Capt. Henry H. Robert, Corps of Engineers. Report unfavorable (H. Doc. No. 1358, 62d Cong., 3d sess.).

11. Yaquina River has also been the subject of the following examinations:

Preliminary examination of Yaquina and Big Elk Rivers, in 1897, by Capt. W. L. Fisk, Corps of Engineers. Report unfavorable (H. Doc. No. 112, 55th Cong., 2d sess.).

Preliminary examination of Yaquina River, Oreg., in 1902, by Capt. W. C. Langfitt, Corps of Engineers. Report unfavorable (H. Doc. No. 240, 58th Cong., 2d sess.).

Preliminary examination of Yaquina River, Oreg., from Yaquina to Elk City, in 1909, by Maj. J. F. McIndoe, Corps of Engineers. Report unfavorable (H. Doc. No. 351, 61st Cong., 2d sess.).

Preliminary examination of Yaquina River, Oreg., from Toledo to Yaquina, in 1911, by Maj. Jay J. Morrow, Corps of Engineers. Favorable recommendation for completion of port project at an estimated cost of \$72,000 (H. Doc. No. 519, 62d Cong., 2d sess.).

## PROJECTS FOR THE IMPROVEMENT OF THE ENTRANCE.

12. In 1880 \$40,000 was appropriated and Maj. G. L. Gillespie, Corps of Engineers, prepared a project for construction of a high-tide brush mattress and stone jetty about 4,000 feet long on the south side of the entrance to Yaquina Bay, to close a rock-obstructed channel, and to provide a central free channel of increased depth; the depth to be obtained in 1891 was 17 feet, which was subsequently raised to 19 feet at mean high tide; estimated cost \$465,000. This project was adopted in 1881 and work commenced the same year.

In 1886 \$235,000 was appropriated for the work, and Capt. C. F. Powell, Corps of Engineers, proposed the construction of a north jetty, which, with the further extension of the south jetty, was estimated to cost \$308,970 additional to the amount already appropriated.

In 1888 Capt. W. Young, Corps of Engineers, recommended the construction of a mid-tide jetty of rubblestone extending from the north head along and behind the reef for a distance of about 2,300 feet, also to raise the south jetty to full high water, leaving an entrance width between the jetties of about 1,000 feet, at an estimated cost of \$196,750. Approved by the Board of Engineers in 1889.

In 1890 \$145,600 was estimated as required to complete the project.

In 1892-3 Capt. Thomas W. Symons, Corps of Engineers, modified the project of 1888 by providing for raising the north jetty to full high tide and for constructing five groins channelward from the south jetty.

In 1895 a board of engineers recommended the extension of the north jetty 2,100 feet and the south jetty 2,000 feet and the removal of rock in the projected channel, and the construction of a spur 800 feet long inside the existing south jetty, all at an estimated cost of \$1,025,000.

In 1899 a board of engineers did not deem the harbor worthy of further improvement, with the exception of the removal of rock in the channel near the south jetty, which could be removed for \$20,000 from funds available.

The river and harbor act of March 3, 1905, provided that the unexpended balance should be returned to the Treasury, except that an amount may be retained sufficient for maintenance for two years. In compliance with this act, on July 1, 1907, an unexpended balance of \$1,681.04 reverted to the Treasury.

## HISTORY OF THE IMPROVEMENT OF THE ENTRANCE.

13. The work of building jetties at the entrance was commenced in 1880. A high-tide south jetty of rubble, 3,500 feet long, and a high-tide north jetty of rubble, 2,800 feet long, with their sea ends 1,000 feet apart, were completed in 1895.

Several pinnacle rocks, which projected from the rocky foundation of the ocean bar about 2,000 feet from the ends of the jetties, were removed during the summers of 1901 and 1902. The total cost of the improvement was about \$715,000, including the removal of submerged rocks and surveys.

There was no cooperation on the part of the local interests in the construction of the jetties. Local interests contributed about \$1,000 in 1888 to prevent shore erosion on the south beach.



The jetties when completed resulted in securing generally a single channel across the bar with a controlling depth at mean lower low water of from 10 to 14 feet.

#### PRESENT CONDITION OF JETTIES AND RIVER.

14. Since completion both the north and south jetties have been considerably beaten down by the winter storms. Both jetties are exposed to within 200 or 300 feet of their outer ends at extreme low tide. It is estimated that at high tide the inner one-quarter of the north jetty enrockment and at least the inner half of the south jetty enrockment are above ordinary high water. The receiving wharves, tramways, and all plant have practically been destroyed or removed.

The result of the jetty construction is a net gain of 5 or 6 feet of controlling depth in a more permanent channel across the bar.

15. In 1912 a project for the improvement of the Yaquina River by securing a channel 150 feet wide and 10 feet deep at mean lower low water between deep water opposite Oysterville and Toledo on Depot Slough, about  $6\frac{1}{2}$  miles above, in cooperation with local interests, was approved. This work was completed in 1914 by building two dikes and dredging, and some subaqueous rock removal. The cost of the work was \$72,000, of which the port of Toledo, representing the local interests, contributed 60 per cent. Since the completion of the improvement the dredged channel has maintained itself satisfactorily, although it has shoaled slightly in a few places.

#### RESOURCES.

16. The watershed and the neighboring country within 15 or 20 miles of Yaquina Bay is hilly and covered for the most part by brush and small trees. The original stand of timber was burned off many years ago, and the drainage basin is neither populous nor rich in undeveloped natural resources or agricultural products.

There are two towns on the bay. Newport, a summer resort near the entrance, with a permanent population of about 700; and Toledo, the county seat, on the railroad, with 800 inhabitants, situated on Depot Slough at its mouth. Besides these, there is a village of about 100 people at Elk on the river 20 miles from the entrance, and a small settlement at Yaquina, about 3 miles above Newport.

Of the local industries the most important are a sawmill at Toledo and a smaller one at Elk, with a combined capacity of about 200,000 feet board measure per day. Since the improvement of the river channel the Toledo mill has shipped several cargoes of lumber to California points in vessels carrying from 600,000 to 650,000 feet board measure on a draft of about 14 feet. Shipments are not being made at present on account of the depressed condition of the lumber market. There is a creamery at Toledo and a small salmon cannery situated above Yaquina, but no fish have been packed for two years. The run of salmon in the bay, however, is not large. A good many oysters are obtained near Oysterville and shipped to market. The country is especially adapted to stock raising and dairying, and these industries are increasing. The narrow bottoms of the streams are fertile and produce good crops of vegetables, hay, and fruits.

Many halibut are taken on the fishing banks off the coast 15 or 20 miles from Yaquina Bay, and a small cold-storage plant has been established at Newport to care for the catch.

17. Yaquina Bay is the terminus of the Corvallis & Eastern Railroad, now a branch of the Southern Pacific Railway. This road runs from Yaquina to Hoover, in the Cascade Mountains, a distance of 142 miles, and crosses the main line of the Southern Pacific at Albany, in the Willamette Valley. The railroad owned several steamers in the eighties and operated them to San Francisco; among which were the *Yaquina City*, of 1,200 net tons and 14 feet draft, also the *Willamette Valley*, *Eastern Oregon*, and *Yaquina Bay*, drawing 15 feet, which was wrecked in entering the bay in 1888. Several years ago the *Francis Leggett* made one voyage from the bay, drawing 16 feet and carrying nearly 1,000,000 feet board measure of lumber.

At the time the railroad was built it was hoped by those interested that the improvement of Yaquina Bay would develop an important water route to California ports from the Willamette Valley. These hopes were not realized.

#### COMMERCIAL STATISTICS.

18. Commercial statistics on Yaquina Bay have not been collected since 1902, but the following is a comparative statement of the commerce of the port for the years 1882 to 1902, inclusive:

Year.	Com- merce.	Depth at mean high water.	Year.	Com- merce.	Depth at mean high water.
	<i>Tons.</i>			<i>Tons.</i>	
1882.....	1,830	14-17	1893.....	24,767	21
1883.....	1,359	17	1894.....	23,345	19-21
1884.....	4,995	19	1895.....	24,589	19-22
1885.....	9,951	18	1896.....	17,883	22
1886.....	6,249	20	1897.....	15,364	-----
1887.....	24,694	18	1898.....	10,380	22
1888.....	23,431	21	1899.....	5,990	19
1889.....	32,921	18-19	1900.....	691	18
1890.....	40,074	18-19	1901.....	576	17-19
1891.....	27,540	18	1902.....	1,152	18-19
1892.....	27,111	17-22			

The following commercial statistics for the calendar year ended December 31, 1914, have been furnished by the United States deputy collector of customs at Newport, Oreg.

Arrivals and clearances irrespective of number of vessels:

Steamers.....	33
Gasoline boats.....	263

*Freight traffic.*

Articles.	Amount in custom-ary units.	Amount in short tons.	Valua-tion.
Brick.....	7,500.....	15	\$1,500
Box shooks.....	5,360 bundles.....	134	4,020
Cannery supplies.....	328 tons.....	328	32,800
Cheese.....	1 ton.....	1	360
Cement and lime.....	680 barrels.....	102	1,360
Coal.....	451 tons.....	451	2,255
Dynamite.....	65 tons.....	65	19,500
Flour.....	1,970 barrels.....	197	9,850
Fruit.....	3,040 hundredweight.....	152	9,120
General merchandise.....	3,368 tons.....	3,368	336,800
Halibut.....	275 tons.....	275	16,500
Hay and feed.....	280 tons.....	280	4,200
Lath.....	390 bundles.....	9	58
Lumber.....	6,197,000 feet b. m.....	12,394	77,462
Machinery.....	87 tons.....	87	17,400
Oil.....	750 barrels.....	150	938
Shingles.....	6,636 bundles.....	138	4,977
Tan and chittim bark.....	57 tons.....	57	5,700
Other articles.....	38 tons.....	38	3,800
Total.....		18,241	548,600

19. The water-borne commerce is chiefly carried on now by gasoline schooners of from 100 to 300 tons, but vessels drawing as much as 14 feet can safely use the harbor at present at high tide. The freight rate by sea between bay points and Portland, Oreg., is \$6 per ton. The rate on lumber from Toledo, Oreg., to San Francisco, Cal., is \$4 per 1,000 feet board measure.

20. The future great resource of the region is the standing timber of the Siletz Valley, which lies from 10 to 20 miles to the north and which is reported to contain 12,000,000,000 feet board measure of the finest fir, spruce, and hemlock, the natural water outlet for which is Yaquina Bay.

**PORT DISTRICTS.**

21. There are two port districts in the locality, formed under State laws, the port of Toledo, with an assessed valuation of \$1,364,612, which cares for the waterway above Oysterville to Toledo and has bonded itself for \$50,000 for improving the river to Toledo, and the port of Newport, with an assessed valuation of \$1,109,104, which attends to the commercial welfare of the bay proper. The latter port has not bonded its district, but has constructed a public wharf at Newport from direct taxes. The timber interests of Siletz Valley are not organized, but it is believed they will eventually act with these two ports in the improvement of the entrance. The total assessed valuation of Lincoln County for the year 1914 is \$10,187,235, with an area of 643,000 acres.

**DESIRES OF LOCAL INTERESTS.**

22. The local interests are all desirous of having the ocean bar improved by the restoration and extension of the jetties and the removal of obstructing rock.

On September 18, 1915, a mass meeting of the citizens of Lincoln County, including the commissioners of the ports of Newport and Toledo, was held in Newport for the purpose of taking steps to secure

the improvement of Yaquina Harbor. Although no definite offer of cooperation was made, this meeting, representing the local interests, resolved that the sense of the meeting was that if a feasible project at a reasonable cost can be adopted, a liberal percentage of the cost of said improvement will be contributed by local interests; also that they were willing to bear one-half of the cost of a survey.

#### RAILROADS.

23. The only railroad in the vicinity is the Corvallis & Eastern, which runs down the valley of the Yaquina River from its source and terminates at Yaquina, about  $3\frac{1}{2}$  miles from the entrance, where vessels can be loaded directly from the cars on the company's private wharf.

#### PUBLIC WHARVES.

24. The port of Newport has constructed a public wharf with 140-foot face, on 600 feet of public water frontage in the town of Newport, at a cost of about \$6,000.

The port of Toledo purchased about 400 feet of water frontage on the improved channel of Depot Slough and has built a wharf with a 200-foot frontage at a cost of about \$3,000. The track of the Corvallis & Eastern Railroad passes very close to this wharf, and a spur track could be run onto it at slight expense.

A charge of about 25 cents per ton is made for handling freight over these wharves, which are open to all on equal terms. There are no mechanical appliances for handling freight at either of these wharves.

#### WATER POWER.

25. The fresh-water discharge of the Yaquina River is very small, and there are no water powers in the locality that could be coordinated with any improvement of the bar or bay in this locality.

#### CONCLUSIONS AND RECOMMENDATIONS.

26. It is not believed that present commerce warrants further improvement by the General Government. The only reason for such action would be to improve the harbor to make a better outlet for the timber of Siletz Valley, but in view of the fact that the local interests have expressed a willingness to contribute a liberal percentage of the cost of improvement if a feasible and reasonable project can be adopted, it is believed that the locality is worthy of improvement at least to the extent of making a hydrographic and boring survey of the entrance to determine definitely whether the rocky ledge underlying the bar is of such an extent and elevation as to render the cost prohibitive or unwarrantable.

ARTHUR WILLIAMS,  
*Major, Corps of Engineers.*

[First indorsement.]

UNITED STATES ENGINEER OFFICE,  
NORTHERN PACIFIC DIVISION,  
Portland, Oreg., October 19, 1915.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. Forwarded recommending that a survey be made without local cooperation in the expense of such survey. It is believed that local cooperation should not be accepted until the cost and practicability of the work had been determined.

2. While it appears doubtful if present or immediately prospective commerce would justify further improvement, it is believed that the final settlement of the question of the cost of further improving this harbor is worth more than the estimate for a survey, and the question of local cooperation can not be brought to an issue without an estimate of the cost of the improvement.

CHAS. L. POTTER,  
*Lieutenant Colonel, Corps of Engineers,  
Division Engineer.*

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
February 23, 1916.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. For reasons stated herein, the board concurs with the district officer and the division engineer in recommending a survey in order to determine the extent and advisability of the improvement and the extent of local cooperation that can be secured. The board concurs with the division engineer in the opinion that the entire expense of the survey should be borne by the United States.

2. The board gave a hearing on this subject to-day, and the data<sup>1</sup> submitted by interested parties are transmitted herewith for the information of the district officer.

For the board:

FREDERIC V. ABBOT,  
*Colonel, Corps of Engineers,  
Senior Member Present.*

SURVEY OF YAQUINA BAR, BAY, AND HARBOR, OREG.

UNITED STATES ENGINEER OFFICE, FIRST DISTRICT,  
Portland, Oreg., January 17, 1917.

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army  
(Through the Division Engineer).

Subject: Survey of Yaquina Bar, Bay, and Harbor, Oreg.

1. In compliance with department letter of February 28, 1916, I submit report on survey of Yaquina Bar, Bay, and Harbor, Oreg. This report covers the item in section 2 of the river and harbor act of March 4, 1915, for Yaquina Bar, Bay, and Harbor, Oreg., and also the item in section 2 of the river and harbor act of July 27, 1916, for

Yaquina Bay and Harbor, Oreg., including consideration of any proposition for cooperation of local interests.

2. The report on the preliminary examination which was submitted under date of October 8, 1915, described the locality and its resources and commerce, as well as referring to previous examinations. Since that report no marked changes have taken place.

3. The field work of the survey was done in July and August, 1916, borings being made through the sand to the bedrock. The material overlying the bedrock at the entrance is a fine sand through which the jet pipe was easily pushed until it struck the rock bottom. The plane of reference to which both soundings and borings are referred is mean lower low water, as determined several years ago by this office and referred to a permanent bench mark at Newport.

4. The following maps have been made and accompany this report, viz: A general map of the locality from the bar to Yaquina City, near the upper end of the bay; a map showing the depths to bedrock at the bar and entrance; and a map showing bar soundings.

5. The survey shows the controlling depth on the bar last summer to be about 15 feet at mean lower low water in a channel trending to the southwest, the length of this channel between the 18-foot contours being in its shortest place but 400 feet. There is also a north channel across the bar, which was more generally used by the small gasoline craft, in which the controlling depth was 12 feet at mean lower low water, with a channel length between the 18-foot curves of 2,400 feet. There is also an inner bar shown situated about 2,000 feet inside the outer ends of the jetties on which the controlling depth is 17 feet at mean lower low water. Between the entrance and Yaquina, the terminus of the Corvallis & Eastern Railroad, shoals appear in the channel, just above the town of Newport and about 2 miles from the bar, of considerable extent, on which the controlling low-water depth is not more than 17 feet. The boring survey shows that if the sand were scoured away the controlling depth over the bedrock would be about 22 feet at mean lower low water in a westerly channel. The governing portion of the bedrock lies in a broken ledge running north and south about 2,000 feet from the ends of the jetties and about 800 feet inside the crest of the bar. The bedrock is a moderately soft argillaceous sandstone easily drilled and blasted.

6. It is believed that any plan of improvement should include the restoration and extension of the existing jetties to more fully control the influx of sand at flood tide, especially during storms; to fix the position of the bar channel within more permanent limits; and to scour the sand from off the rocky reef at the bar so that its higher points may be removed by blasting and dredging.

7. An inspection of the boring survey map indicates that the general elevation of the bedrock will not permit of a deeper practical channel than of about 20 feet at mean lower low water without extensive and very expensive subaqueous rock removal. A channel of somewhat greater depth to the rock exists to the north of the present channel range, but it does not lie in an advantageous position, unless a wide channel cut is made through the outer reef, as it crosses the bar too far to the north. An extension of the jetties seaward would undoubtedly cause an advance of the bar in that

direction and possibly entangle the entrance channel with the rocky shoals of the outer reef. It is not proven that sufficient littoral current prevails between the bar and the outer reef to prevent a very considerable advance of the bar if the jetties were extended, and it is possible such advance of the bar seaward would nearly equal that of any moderate jetty extension.

8. The following plan of improvement is proposed to obtain as much controlling depth from the sea to the railroad terminus at Yaquina as the general elevation of the reef will permit, which does not exceed, at the bar, 20 feet at mean lower low water, viz: The extension of the south jetty seaward on line of the existing jetty 2,200 feet; the restoration of and the extension of the existing north jetty seaward 1,400 feet, parallel to the south jetty, with a distance between these jetty extensions of 1,000 feet. This plan of jetty extension is similar to that proposed by the board of engineers in its report dated October 11, 1895 (see Ex. Doc. No. 68, 54th Cong., 1st sess.), but the trace of the south jetty trends slightly more to the north, the better to adapt its location to the control of the underlying bedrock. The south jetty is planned 200 feet shorter than the board's proposed jetty, and the north jetty extension is to be only 1,400 feet long to save expense, as it is believed that a longer north jetty may not be needed. It is proposed to make both extensions of rubblestone to full high tide. It is believed that such jetty extension would uncover the rocky ledge so that it could be more easily removed to a depth of 20 feet at mean lower low water, and that although the bar might be somewhat advanced the direction of the channel would permit of its navigation without undue interference from the outer reef. No groins are proposed, as the proximity of the bedrock would prevent any great undermining of the structures, and in making the estimate of enrockment it is assumed that it will eventually rest on the bedrock. In addition to the jetties for the improvement of the ocean bar, a spur jetty of rubblestone about 800 feet long, similar in position and construction to that proposed by the board of engineers in 1895, is proposed to deepen the channel across the inner bar. For an 18-foot mean lower low water channel to Yaquina,  $4\frac{1}{2}$  miles from the bar, which would be about right for a 20-foot bar depth, the shoals immediately above Newport, on which the governing depth does not now exceed 17 feet, will require dredging for a total distance of about 4,000 feet.

*Estimate.*

**SOUTH JETTY.**

1 receiving wharf.....	\$3,500	
6,300 linear feet single-track tramway approach, at \$4.....	25,200	
1,700 linear feet double-track tramway approach, at \$5.50.....	9,350	
2,200 linear feet double-track jetty tramway, at \$7.....	15,400	
Sidings, spurs, etc.....	2,000	
271,000 tons stone for south jetty enrockment, at \$1.05.....	284,550	
		\$340,000

**SPUR AT SOUTH JETTY.**

950 linear feet single-track tramway, at \$4.....	3,800	
22,500 tons stone, at \$1.05.....	23,625	
		27,425

## NORTH JETTY.

1 receiving wharf.....	\$3, 500
1,500 linear feet single track tramway approach, at \$4.....	6, 000
3,000 linear feet double-track tramway approach, at \$5.50.....	16, 500
1,400 linear feet double-track jetty tramway, at \$7.....	9, 800
Sidings, spurs, etc.....	2, 000
20,000 tons of stone for restoration of existing jetty, at \$1.05.....	21, 000
197,000 tons of stone for north jetty enrockment, at \$1.05.....	206, 850
	<hr/>
	\$265, 650
Removal of 6,000 cubic yards of subaqueous rock from bar reef, at \$20 per cubic yard.....	120, 000
Excavating channel 200 feet wide and 18 feet deep at mean lower low water in bay above Newport, dredging 60,000 cubic yards, at \$0.12 per cubic yard.....	7, 200
Engineering and contingencies, about 10 per cent.....	75, 725
	<hr/>
Grand total.....	836, 000

9. It is estimated that it will require the expenditure of \$5,000 annually for repairs and maintenance during construction and \$5,000 every two years to maintain the 18-foot bay channel. The proposed plan of improvement is indicated on maps herewith. It is assumed that the jetties will be built of sandstone, which occurs in the territory tributary to the bay. After the bar reef is fully exposed it can be cut down to afford a controlling low-water depth of 20 feet by blasting and dredging, although this work will necessarily be expensive on account of its exposed position.

10. An estimate was made of an alternate plan of improvement by extending the rubble high-tide jetties on curves about the same length as those of the first estimate, so as to guide the channel over the deepest part of the bar reef to the north, and at the same time to cut an opening about 900 feet wide and 20 feet deep at mean lower low water through the outer rocky reef in front of the jetty. The cost of this plan would considerably exceed the cost of that for which the estimate is given.

11. It is estimated that to improve and maintain the bar channel by dredging alone to a depth of 20 feet at mean lower low water would cost for a suitable bar dredge at this time about \$500,000, with an annual charge for operation and maintenance of dredge of about \$70,000. It would be almost impossible to dredge a well-placed straight bar channel 20 feet deep at mean lower low water without subaqueous rock removal, which would be extremely difficult until it was first uncovered by scour from jetty extension.

12. The existing channel over the bar is of ample depth to accommodate the existing commerce. It is claimed by local interests that since the passing of the Siletz Indian Reservation into private ownership there is from fifteen to eighteen billion feet board measure of very fine standing timber tributary to Yaquina Bay ready to market. A large proportion of this timber is fully matured and much is overripe. It appears that in the last 14 years the percentage of this overripe timber has increased from about 5 per cent to about 35 per cent. The cutting of this timber and the marketing of the lumber in the very near future is imperative.

13. Only coastwise lumber carriers with capacity of about 600,000 feet board measure can now enter the bay. While the number of



foreign-bound lumber carriers from this coast at the present time is small, it is expected that at the conclusion of the European war there will be an unprecedented demand for lumber abroad and many carriers will then be available for this foreign trade. Deepening of the bar channel will result in the expansion of existing mills and establishment of new ones; such deepening is necessary to accommodate foreign-bound vessels and enable this locality to participate in supplying the anticipated demand. Local interests comprising the ports of Newport and Toledo and the large timber owners will, therefore, agree to contribute one-half of the estimated cost of the work.

14. In view of the large increased commerce that may reasonably be expected and the liberal local cooperation involved, it is my opinion that the proposed improvement by the extension of the existing jetties, subaqueous rock removal, and dredging, as outlined above, at an estimated cost of \$836,000, is worthy of being undertaken by the United States at this time, subject to the condition that local interests shall first satisfy the Secretary of War that they are prepared and will contribute 50 per cent of the first cost of the project.

15. In the event of the adoption of the project by Congress the work should be prosecuted with a view to completion within a period of four years; the initial appropriation should be not less than \$200,000, and the work placed under the continuing-contract system.

16. There are no questions as to terminal facilities, water-power, or other collateral subjects other than those referred to in the report on preliminary examination.

HENRY C. JEWETT,  
*Major, Corps of Engineers.*

[First indorsement.]

OFFICE DIVISION ENGINEER,  
NORTHERN PACIFIC DIVISION,  
*February 3, 1917.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. Forwarded.

2. The plan of improvement submitted is considered well designed to increase the depth of the channel across the bar, and if carried out will probably secure the additional depth contemplated.

3. The improvement is required only to accommodate commerce almost wholly prospective, and its advisability is therefore largely a matter of opinion as to whether or not the expected large commerce will develop to take advantage of the proposed improvement.

4. The timber from which such commerce must come is available, and being already overripe should be marketed as soon as possible to prevent further deterioration. The owners of the timber, in order to secure cheaper transportation to favorable markets, are willing to contribute one-half the cost of securing an improved channel. I am therefore of the opinion that the United States would be warranted in assuming that additional water-borne commerce in sufficient volume to justify the expenditures of the United States will be forthcoming.

5. I therefore concur in the views of the district officer that the improvement of Yaquina Harbor in the manner and upon the conditions of cooperation proposed by him is worthy of being undertaken by the United States.

J. B. CAVANAUGH,  
*Lieutenant Colonel, Corps of Engineers,*  
*Division Engineer.*

[For report of the Board of Engineers for Rivers and Harbors on survey, see p. 3.]

