70TH CONGRESS, 1st Session } HOUSE OF REPRESENTATIVES { DOCUMENT No. 315

CHEHALIS RIVER, WASH.

LETTER

FROM

THE SECRETARY OF WAR

TRANSMITTING

REPORT FROM THE CHIEF OF ENGINEERS ON PRELIMINARY EXAMINATION AND SURVEY OF CHEHALIS RIVER, WASH.

CHEHALIS

MAY 21, 1928.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with three illustrations

WAR DEPARTMENT,
Washington, May 21, 1928.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated May 19, 1928, from the Chief of Engineers, United States Army, on preliminary examination and survey of Chehalis River, Wash., authorized by the river and harbor act approved March 3, 1925, together with accompanying papers and maps.

Sincerely yours,

C. B. ROBBINS,
Acting Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, May 19, 1928.

Subject: Preliminary examination and survey of Chehalis River, Wash.

To: The Secretary of War.

1. I submit, for transmission to Congress, my report, with accompanying papers and maps on preliminary examination and survey of Chehalis River, Wash., authorized by the river and harbor act approved March 3, 1925.

2. Chehalis River, which flows into Grays Harbor, is under improvement as part of the project for Grays Harbor, inner portion, and Chehalis River. The project provides for a channel 18 feet deep from deep water in the bay to Cosmopolis and a channel 6 feet deep between Cosmopolis and Montesano. Another project provides for a channel at the entrance of such depth as can be secured by dredging. Under an agreement made in 1919, local interests now maintain the inner project as far as Cosmopolis. The improvement now desired is a channel 16 feet deep up to Montesano The range of tide between mean lower low water and mean higher high water is 10.1 feet at Hoquiam and 9 feet at Montesano.

3. The commerce on the river and inner harbor, exclusive of 2,549,000 tons which moved over the bar, was 4,631,000 tons in 1926, of which 4,351,000 tons was floated logs. At the present time only one of the mills at Montesano ships its products by water. Some private dredging has been done by that company, so that a 7-foot channel is now available between Cosmopolis and Montesano. Interested parties estimate that a deeper channel would result in a saving of $235,471 annually. It is also pointed out that Montesano is a distributing center for a large area and that the water movement of commodities produced and consumed therein would result from the improvement requested.

4. The district engineer states that in 1926 shipments from Montesano totaled about 100,000,000 feet b. m. of lumber and 7,420,000 laths. Of this total, 38,479,000 feet of lumber was shipped direct to California, while the balance was lightered or rafted to Aberdeen for shipment to the Atlantic coast or for export. A channel depth of 16 feet would, in the opinion of the district engineer, make possible a saving of $1 per thousand feet on lumber and lath shipped to the Atlantic coast, a saving of $1 per thousand on one-fourth of the lumber lightered to Aberdeen for export, and $0.50 per thousand feet on lumber rafted to Aberdeen. On this basis, the total savings are estimated at $41,000. While at present the savings would accrue largely to a single concern, there is expectation of the development of additional traffic in pulp and paper and in farm products.

5. The dredging of channels 10, 13, 16, and 18 feet deep and generally 150 feet wide is estimated to cost $118,000, $231,500, $423,000, and $623,000, respectively. Taking into account the 9-foot tidal range at Montesano, loaded drafts up to 18, 21, 24, and 25 feet would be possible on channels 10, 13, 16, and 18 feet deep, respectively. A 16-foot channel would permit the operation of the smaller vessels engaged in the off shore and intercoastal trade, while the traffic which could be accommodated on 10 and 13-foot channels would be limited to light-draft steam schooners in the coastwise trade. No additional vessel movements would be provided by a channel 18 feet deep, although such craft would be able to operate at a lower stage of the tide or would be able to carry heavier loads. The port authorities agree with the district engineer that the additional cost of an 18-foot channel would not be justified. The district engineer therefore recommends a channel 16 feet deep and generally 150 feet wide, at an estimated cost of $423,000, provided local interests pay one-half the cost, assume the entire cost of maintenance and provide a suitable public terminal at Montesano.

6. The cost of the improvement appears to the division engineer to be very large in proportion to the prospective benefits. He considers that the usable depths and corresponding vessel drafts given by the district engineer are overestimated. Future work of the United States should, in the opinion of the division engineer, be limited to improvement at the entrance of Grays Harbor, local interests assuming the entire cost of the work in the inner river and harbor.

7. The report of the district engineer has been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, agreeing in general in his views.

8. After due consideration of the above-mentioned reports I concur in the views of the Board of Engineers for Rivers and Harbors. Montesano, about 15 miles by water above Aberdeen, is a growing community and a distributing center for a large area. Prospective developments in addition to the existing water movements of lumber appear, on the basis of estimated savings in transportation costs, to justify Federal expenditure to the extent recommended. I therefore report that modification of the existing project for Grays Harbor, Inner Portion, and for Chehalis River, Wash., is deemed advisable so that the project shall hereafter provide for a channel 18 feet deep and 200 feet wide from deep water in the bay to Cosmopolis, and a channel 16 feet deep and 150 feet wide thence to Montesano, at an estimated cost of $423,000, subject to the provision that local interests pay one-half the first cost of the work and give assurances satisfactory to the Secretary of War and the Chief of Engineers that they will assume the entire cost of maintenance and will provide a suitable public terminal at Montesano. The estimated cost of the work to the United States is $211,500.

EDGAR JADWIN,
Major General, Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

SYLLABUS

The Board of Engineers for Rivers and Harbors concurs with the district engineer in recommending a channel 16 feet deep and 150 feet wide between Cosmopolis and Montesano, subject to certain conditions of local cooperation.

[Third indorsement]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., May 16, 1928.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the reports on preliminary examination and survey of Chehalis River, Wash., authorized by the river and harbor act approved March 3, 1925.

2. Chehalis River flows into Grays Harbor, which is under improvement by the United States for the provision of a channel at the entrance of such depth as can be secured by dredging, and for a channel 18 feet deep from deep water in the bay to Cosmopolis. Provision is also made for a 6-foot channel between Cosmopolis and Montesano. Under an agreement made in 1919, local interests now maintain the

inner project as far as Cosmopolis. The improvement desired was at first stated to be a channel 26 feet deep, but subsequently interested parties stated that they would be satisfied with a 16-foot channel. The range of tide between mean lower low water and mean higher high water is 10.1 feet at Hoquiam and 9 feet at Montesano.

3. The commerce moving over the bar in 1926 amounted to 2,549,000 tons; in 1925 it was 1,778,000 tons; and in 1924, 1,680,000 tons. The commerce of the river and inner harbor, exclusive of that passing over the bar, was 4,631,000 tons in 1926, of which 4,351,000 tons was floated logs. There are several sawmills at Montesano, only one of which ships its products by water at the present time. That company has done some private dredging, so that a 7-foot channel is now available at mean lower low water, and vessels drawing as much as 15½ feet have been moved from Montesano. It is claimed that in addition to the lumber moved on the river from Montesano, that point is a distributing center for a large area, and that the improvement requested would result in the water movement of commodities produced and consumed therein. In a brief submitted by interested parties a possible saving is shown of $235,471 annually.

4. The district engineer states that shipments from Montesano in 1926 included, in addition to 38,479,000 feet b. m. of lumber shipped direct to California, 18,277,000 feet b. m. of lumber and 7,420,000 lath lightered to Aberdeen from Montesano for shipment to the Atlantic coast. Also there was moved to Aberdeen for export 22,509,000 feet b. m. of lumber on lighters and 20,218,000 feet b. m. of lumber in rafts. With a 16-foot channel the district engineer thinks that there would be a possible saving on a movement equivaalent to that handled in 1926 of $1 per 1,000 feet b. m. on lumber and laths shipped to the Atlantic coast, a saving of $1 per 1,000 feet on one-fourth of the lumber lightered to Aberdeen for export, and 50 cents per 1,000 feet on the lumber rafted to Aberdeen. These savings total in round numbers about $41,000. The estimates are based on the assumption that some of the vessels which operate to the Atlantic coast and foreign ports would go to Montesano for lumber, notwithstanding the dangers and difficulties of navigating the channel. At the present time the savings would accrue largely to a single concern. There is a possibility, however, of the development of additional trade in pulp and paper and in farm products.

5. Estimates are submitted of the cost of dredging channels 10, 13, 16, and 18 feet deep, and generally 150 feet wide, of $118,000, $231,500, $423,000, and $623,000, respectively. The material is in general sand and gravel throughout, except for the 18-foot channel where some rock will be encountered. With a 9-foot tidal range at Montesano, channels 10, 13, 16, and 18 feet deep at mean lower low water would accommodate at high water vessels with loaded drafts up to 18, 21, 24, and 25 feet, respectively. While the 10 and 13-foot channels would accommodate light-draft steam schooners engaged in coastwise trade, a 16-foot channel would in addition permit the operation of the smaller vessels engaged in the offshore and intercoastal trade. A channel 18 feet deep would not provide for additional vessel movements, but would permit their operation at a lower stage of the tide or would admit of carrying heavier loads. The additional cost of an 18-foot channel does not appear to the district engineer to be justified and the port authorities agree in this view. He therefore recommends a channel 16 feet deep and 150 feet wide, at an estimated cost of $423,000 provided local interests pay one-half the cost, assume the entire cost of maintenance and provide a suitable public terminal at Montesano.

6. The division engineer considers that the usable depths and corresponding vessel drafts given by the district engineer are overestimated. The cost of the improvement appears to him to be very large in proportion to the prospective benefits. The United States should, in his opinion, limit its future work of improvement at Grays Harbor and connecting waterways to the entrance, local interests assuming the entire cost of work in the river and inner harbor.

7. In its study of the case the board has received additional information from interested parties. They indicate a willingness to assume the full amount of cooperation recommended by the district engineer. Montesano, which is located about 15 miles by water above Aberdeen, is a growing trade center. The products and supplies of a considerable area would probably move to some extent by water. The prospective developments of this area, in addition to the existing lumber movements, appear, on the basis of estimated savings and transportation costs, to justify Federal expenditure to the extent recommended by the district engineer. The board therefore recommends modification of the existing project for Grays Harbor, inner portion, and for Chehalis River, Wash., so that the project shall hereafter provide for a channel 18 feet deep and 200 feet wide from deep water in the bay to Cosmopolis, and a channel 16 feet deep and 150 feet wide up to Montesano, at an estimated cost of $423,000, subject to the provisions that local interests pay one-half the first cost of the work and give assurances satisfactory to the Secretary of War and the Chief of Engineers that they will assume the entire cost of maintenance and will provide a suitable public terminal at Montesano. The estimated cost of the work to the United States is $211,500.

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:

HERBERT DEAKYNE,
Brigadier General, Assistant Chief of Engineers,
Senior Member.

PRELIMINARY EXAMINATION OF CHEHALIS RIVER, WASH.

SYLLABUS

The present channel to Montesano has a depth of 14 to 14½ feet at high tide and steam schooners are now taking out part cargoes of lumber from the mills located there. The improvement asked for is a channel 26 feet deep at mean lower low water with a view to providing for direct shipments of lumber to Atlantic coast and foreign ports and to making Montesano the port for the entire Grays Harbor territory.

The district engineer does not consider that it would be economically advisable to extend deep water to Montesano above the already existing ports on Grays Harbor. The immediately prospective commerce is not large, consisting mainly

of lumber shipments from one concern, and while large savings in freight charges are claimed no offer of local cooperation is made. The cost of the improvement would be large both in first cost and maintenance and, in his opinion, disproportionate to the general or national benefits. An improvement to a lesser depth that would be sufficient to provide for full loading of vessels in the California trade and possibly part cargoes for certain types of vessels in the intercoastal and oriental trade would also be quite expensive and the benefits would be still more local and special. He therefore recommends that no further improvement of the Chehalis River than that now authorized be undertaken at this time.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Seattle, Wash., August 22, 1925.

Subject: Preliminary examination of Chehalis River, Wash.
To: The Chief of Engineers, United States Army.

1. In compliance with section 8 of the river and harbor act of March 3, 1925, and instructions contained in department letter [1] of March 19, 1925, the following report, with map,[1] is submitted on a preliminary examination of Chehalis River, Wash. This river is now under improvement in connection with the inner portion of Grays Harbor, under the title "Grays Harbor, inner portion, between Aberdeen and the entrance to said harbor, and Chehalis River, Wash."

2. *General description.*—The Chehalis River rises in the southwestern part of the State of Washington, about 40 miles east of the Pacific Ocean, flows in a northerly and then westerly direction and empties into the eastern part of Grays Harbor. Its length is about 115 miles and its drainage area, including the Wishkah River, approximately 2,140 square miles. Considering the mouth as being located just below Cow Point, Aberdeen, where the north and south channels of the inner harbor branch, the distance to Cosmopolis is about 4½ miles, to Montesano 15 miles, and to Elma 27 miles. The tidal portion extends to Elma. The average tidal range at Montesano is about 7 feet as compared with 8½ feet at Aberdeen. The extreme tidal range at Hoquiam, 3 miles below Aberdeen, is 16.6 feet. The range between mean lower low water and mean higher high water is 10.1 feet. The width between Cosmopolis and Montesano varies from about 500 to 1,000 feet. There are no discharge data available.

3. *Original condition.*—When first officially examined in 1875, the river was found obstructed by log jams or rafts at the Chehalis Indian Reservation, near the mouth of Black River, but it was considered as navigable for light-draft boats during the high-water season to Claquato (near the present town of Littell), 3 miles above the mouth of the Newaukum River and some 80 to 90 miles above the mouth of the Chehalis. Below Montesano there was about 5 feet depth at extreme low tide, and sufficient depths at high tide for coastal steamers then in use. Above that point the river was obstructed by snags, drift, and gravel bars, having but little depth of water thereon during the low-water season.

4. *Examinations and surveys.*—Examinations and surveys of this locality and reports thereon have been made as follows:

(*a*) Examination of "Chehalis River for removing jams, Washington Territory," ordered by the river and harbor act of June 23, 1874. Report dated February 8, 1875, page 799, Annual Report, Chief of Engineers, 1875, submitted an estimate of $32,500 for removal of two jams or rafts.

(*b*) "Survey of Chehalis River in Washington Territory" ordered by the river and harbor act of March 3, 1881. Report dated January 26, 1882, page 2686, Annual Report, Chief of Engineers, 1882, and Senate Executive Document No. 112, Forty-seventh Congress, first session. Favorable for removal of rafts and snags, at an estimated cost of $5,000.

(*c*) Preliminary examination and survey of "Grays Harbor and Bar, and extending up Chehalis River to Montesano," ordered by the river and harbor act of September 19, 1890. Reports on preliminary examination dated October 3, 1890, and on survey dated April 29, 1891, page 3297, Annual Report, Chief of Engineers, 1891. Favorable for improvement of inner harbor by construction of dikes, at an estimated cost of $46,200, and for dredging and closing subsidiary channels in Chehalis River, at an estimated cost of $103,400.

(*d*) Preliminary examination and survey of "Grays Harbor, inner portion, and Chehalis River to Montesano," ordered by the river and harbor act of March 3, 1905. Reports on preliminary examination dated June 23, 1905, and on survey dated January 10, 1906, House Document No. 507, Fifty-ninth Congress, first session. Favorable for a 200-foot channel 18 feet deep at mean lower low water from Grays Harbor City to Cosmopolis, at an estimated cost of $187,500. Unfavorable for any additional improvement of Chehalis River above Cosmopolis.

(*e*) Survey and estimate, "with a view to the improvement of the Chehalis River up to Montesano by the removal of bars," ordered by the river and harbor act of March 2, 1907. Report dated March 31, 1908, House Document No. 1125, Sixtieth Congress, second session. Favorable for increase of depth to 6 feet, at an estimated cost of $50,000.

5. *Previous projects.*—The original project for Chehalis River was based on the report of January 26, 1882 (A. R., C. of E., 1882, p. 2686), and contemplated the removal of snags and log jams as far as Claquato at an estiamted first cost of $5,000 and with annual maintenance. The first appropriation was made in the river and harbor act of August 2, 1882 and subsequent appropriations were made, amounting in all to $19,000. The jams were removed in 1884 and snagging was carried on intermittently thereafter. Some work was done as far up as Chehalis, but in general it was limited to the portion of the river below, or to a limited distance above Montesano.

6. The river and harbor act of July 13, 1892, adopted the project for Grays Harbor (inner portion) and Chehalis River recommended in the report of April 29, 1891 (A. R., C. of E., 1891, p. 3297), which contemplated a channel 200 feet wide and 16 feet deep at mid-tide as far as Montesano to be secured by the construction of dikes in the harbor to concentrate the flow in the north channel (estimated cost $46,200) and by dredging four shoals and closing subsidiary channels in the Chehalis River (estimated cost $103,400). The act of 1892 appropriated $50,000 for this work and the act of 1894, $25,000. Work of dike construction in the harbor was commenced under contract in 1893 and completed in 1895. Some dike work was done in the river but no dredging. Work under this project was suspended and the remaining balance turned into the Treasury in 1896.

[1] Not printed.

7. The river and harbor act of June 13, 1902 appropriated $50,000 for "Improving Grays Harbor, inner portion, between Aberdeen and the entrance to said harbor, and Chehalis River, Washington" and these two projects were thereafter combined. With these funds and $30,000 additional appropriated in the act of March 3, 1905, the harbor dikes were repaired and a 15-foot channel dredged. Snagging in the river was continued but no other work done there. On the completion of this work a maximum draft of 11 feet at mean lower low water could be carried to Cosmopolis and 5½ feet to Montesano.

8. The total amount spent was $113,134.38 for improvement and $37,415.45 for maintenance of dikes and snagging, making a total of $150,549.83. It is impracticable to give the division between expenditures in the harbor and in the river proper, but probably not to exceed $40,000 was spent in the river.

9. *Existing project.*—The existing project provides for an 18-foot channel to Cosmopolis and a 6-foot channel thence to Montesano.

10. The act of March 2, 1907, provided for dredging a channel 200 feet wide and 18 feet deep at mean lower low water between Cosmopolis and deep water in the bay at an estimated cost of $187,500 as recommended in House Document No. 507, Fifty-ninth Congress, first session. This act also directed a survey and estimate with a view to the improvement of the Chehalis River to Montesano. The report on that survey contained in House Document No. 1125, Sixtieth Congress, second session, recommended a channel 6 feet deep at mean lower low water to be secured by dredging and a small amount of dike work, at an estimated cost of $50,000, together with annual snagging. This project was adopted by the act of June 25, 1910.

11. *Work done and present condition.*—The work of dredging the 18-foot channel was started by contract in 1907 and completed by the U. S. dredge *Oregon* in 1910. The 6-foot channel to Montesano was dredged by the *Oregon* in 1910. No dike work was done, the subsidiary channels being closed by pumping the dredged material therein. The total number of yards removed was approximately 1,800,000, of which 64,000 were from the river above Cosmopolis.

12. The channels have required frequent redredging. Maintenance dredging has amounted to approximately 1,430,000 yards of which 60,000 were in the river. Snagging has been done as required.

13. The expenditures from United States funds to June 30, 1925, have been $238,188.26 for new work and $121,042.68 for maintenance, a total of $359,230.94, and from contributed funds $32,496.12. Of the total amount expended probably only about $15,000 was in the river proper.

14. The port of Grays Harbor Commission (see par. 28) has removed approximately 5,787,000 yards in maintaining and deepening the channel below Cosmopolis. The controlling depths at mean lower low water in June, 1925, were 22 feet below Hoquiam, 25 feet between Hoquiam and Cosmopolis, and 7 feet from Cosmopolis to Montesano.

15. *Bridges.*—The lower river is crossed by seven bridges as shown by the following table:

No.	Miles above mouth	Location with reference to nearest town	Owner	Character	Clear width	Vertical clearance at high water
					Feet	*Feet*
1	1½	At Aberdeen	Oregon-Washington R. R. & Navigation Co.	Swing	125	8
2	1¾	do	City of Aberdeen	do	130	8.5
3	3¼	At South Aberdeen	Tacoma, Olympia & Grays Harbor Ry. (now N. P.).	do	125	9
4	15¼	At Wynoochee	Oregon-Washington R. R. & Navigation Co.	do	100	8
5	15½	Wynoochee-Montesano	Grays Harbor County	do	100	8
6	23¾	Opposite Satsop	do	Fixed	194	8
7	28¼	Opposite Elma	do	do	260	17

16. *Resources and local industries.*—Aberdeen, Hoquiam, and Cosmopolis, with population, according to the 1920 census, of 15,337, 10,058, and 1,512 respectively, are located on deep water. Montesano, at the head of the 6-foot project, 10½ miles above Cosmopolis, had a population according to that census of 2,158, and is the trade and distributing center for the entire eastern portion of Grays Harbor County. The population of the territory tributary to the harbor is in round numbers about 60,000. The business and manufacturing activities consist mainly in the production of lumber, cascara bark, cheese and dairy products, condensed milk, and canned fruits and vegetables.

17. *Railways and highways.*—The locality is served by branch lines from three transcontinental railroads, the Northern Pacific, Union Pacific, and Chicago, Milwaukee & St. Paul. The former parallels the river on the right bank and the other two use a joint track on the south bank. A number of branch lines, mostly logging roads, connect with the lines on both banks.

18. The Olympic Highway passes down the right bank and gives connection by paved road to Puget Sound and Columbia River ports.

19. *Steamship lines.*—Coastwise vessels of the steam schooner type are now making regular trips to Montesano as follows:

Hartwood Lumber Co.: Three boats, six monthly trips, carrying 1,000,000 feet of lumber. Draft, 14.5 feet on 50 per cent load. Capacity, 2,000,000 feet board measure.

W. R. Chamberlain Line: Two boats, four trips monthly. One million feet of lumber per load. Draft, 14.5 feet on 50 per cent load. Capacity 2,000,000 feet board measure.

R. Wilson Lumber Co.: One boat, two trips per month. Capacity, 550,000 feet board measure.

20. *Adjacent ports.*—Grays Harbor is 45 miles north of the entrance to Columbia River. Willapa Harbor and River, with a depth of 24 feet, on which are located the towns of Raymond and South Bend, and from which large shipments of lumber are made, lies about 15 miles to the south. To the north there are no harbors suitable for deep-draft vessels between Grays Harbor and Cape Flattery at the entrance to the Straits of Juan de Fuca.

21. *Commerce.*—The coastwise and foreign commerce of Grays Harbor, i. e., that crossing the outer bar—amounted in 1924 to 1,681,380 tons, valued at $28,928,655. The outbound cargoes consisted of 1,596,753 tons of lumber valued at $25,548,048; and 426 tons miscellaneous valued at $82,181. The inbound cargoes consisted of 73,480 tons of oil and gasoline valued at $1,619,510; 3,757

tons food products valued at $690,813; 3,310 tons of steel and wire rope valued at $302,918; 3,654 tons miscellaneous valued at $685,185. A comparative statement for the years 1920 to 1924 is as follows:

Comparative statement

Calendar year	Short tons	Value	Calendar year	Short tons	Value
1920	625,437	$14,429,471	1923	1,402,304	$28,761,989
1921	636,571	8,821,602	1924	1,681,380	28,928,655
1922	1,180,289	22,741,793			

22. The internal traffic—i. e., that in the inner harbor and Chehalis River—amounted in 1924 to 4,205,124 tons, valued at $27,720,875. This consisted of 3,831,726 tons floated logs, value $22,990,356; 174,749 tons lumber, value $2,795,984; 176,639 tons sand and gravel, value $158,637; 12,690 tons fuel oil, value $145,301; 1,084 tons fresh fish, value $113,820; 1,910 tons railroad rails, $124,150; 857 tons machinery, $359,940; and 5,469 tons miscellaneous, $1,032,687. A comparative statement for the years 1920 to 1924 is as follows:

Comparative statement [1]

Calendar year	Total [2]		Floated timbers	
	Short tons	Value	Short tons	Value
1920	1,671,922	$13,826,012	1,482,793	$13,345,137
1921	1,908,663	8,960,552	1,761,000	8,488,020
1922	2,532,546	15,381,849	2,352,768	12,484,300
1923	3,739,062	27,421,106	3,386,250	23,703,750
1924	4,205,124	27,720,875	3,831,726	22,990,356

[1] Exclusive of traffic credited to "Grays Harbor and bar entrance," in 1924, 1,681,380 tons, valued at $28,928,655.
[2] Includes floated timbers.

23. Until recently the commerce on the river between Cosmopolis and Montesano consisted entirely of rafted logs, floated lumber, lightered lumber, shingles and laths, sand and gravel, and a small amount of miscellaneous materials, all handled by towboats with a maximum draft of 9 feet, for which the available depth is ample by taking advantage of the tide. About a year ago, however, the Schafer Bros. Lumber Co., which operates three mills at Montesano and Wynoochee, induced a steam schooner operator to make an experimental trip to their docks to load a partial cargo. This was successful and regular trips have since been made, drafts of 14 to 14½ feet being carried on tides with cargoes of about 1,000,000 feet board measure. From June, 1924, to June, 1925, about 60,000 tons were handled in this manner.

24. The total commerce for the calendar year 1924 was as given by the following table:

Classes and commodities	Amount in short tons by commodities		Amount in short tons by classes	Value	
	Bulk	Package		By commodities	By classes
Internal, downstream:					
Wood and paper			1,006,637		$7,450,917
Logs floated	873,000			$5,238,000	
Lumber barged	91,136			1,533,820	
Lumber floated	16,460			263,360	
Lumber (coastwise)	25,052			400,832	
Lath		749		9,625	
Shingles		240		5,280	
Nonmetallic minerals			176,264		158,637
Gravel	157,938			142,144	
Sand	18,326			16,493	
Total downstream	1,181,912	989	1,182,901		7,609,554
Internal upstream: Ores, metals, and manufactures of—Steel rails	400		400	26,000	26,000
Total	1,182,312	989	1,183,301		7,635,554

Summary

Classes of commodities	Internal	
	Tons	Value
Wood and paper	1,006,637	$7,450,917
Nonmetallic minerals	176,264	158,637
Ores, metals, and manufactures of	400	26,000
Total	1,183,301	7,635,554

25. *Views of local interests.*—For the purpose of securing the desires and views of local interests a public hearing was held at Montesano on July 7, 1925, at which some 60 persons were present. Copies of the notice [1] of the hearing, list [1] of persons to whom it was sent, and minutes [1] of the hearing accompany this report. A brief [1] submitted jointly by the Montesano Chamber of Commerce and the port of Grays Harbor is also inclosed.

26. The additional improvement desired is the deepening by dredging of the Chehalis River between Cosmopolis and Montesano to a depth of 26 feet at mean lower low water so that practically all vessels in the lumber-carrying class, coastwise, intercoastal, or foreign, may go direct to Montesano and depart with full cargo.

27. The arguments in favor of this improvement as set forth in the brief of the Montesano Chamber of Commerce and the port of Grays Harbor, and stated by those who spoke at the hearing, are substantially as follows; that it is a—

broad general principle proven by the history of every important world port that navigation always goes inland as far as possible and that a community enjoying the privilege of water transportation well into its interior has a very decided advantage over a port whose hinterland is served only by harbors immediately adjacent to the coast. Furthermore, this advantage is shared by the entire country adjacent to the port, due to the lessened cost of marketing by water. There can be no question that the improvement of the Chehalis River will make Montesano the port for the entire Grays Harbor territory. With the improvement of the Chehalis River there will be an immediate saving on the transportation of all commodities produced and consumed in the territory from Montesano eastward to and including Chehalis and Centralia. This

[1] Not printed.

entire territory is at the present time under a handicap due to the fact that the development of Grays Harbor and its tributary, the Chehalis, has stopped 12 miles below the logical head of navigation. * * * With the opening of the Chehalis River to Montesano, it is natural to assume that the city will become the port for any territory from or to which goods may be shipped overland at rates cheaper than to some other port. The division of territory in this case, therefore, must be determined at rail points where the rates are equal either to Montesano, Portland, or Tacoma. These points are located about 10 miles north and south, respectively, of Chehalis. * * * The principal commodities available for shipment in the territory that would be opened to water commerce with the improvement of the Chehalis River, are lumber and forest products, canned goods, cascara bark, and agricultural products. At the present time, such of these commodities as are sent to markets served by ocean carriers must be transported either by rail or truck to the municipal docks operated at Aberdeen and Hoquiam, or are lightered down the Chehalis River from Montesano to Cosmopolis, or points to the westward. The improvement of the Chehalis River to Montesano would eliminate much of this inconvenience and unnecessary expense.

That while the present amount of ocean-going commerce is small, being limited by the available draft, with the improvement asked for all of the commodities produced and consumed in the territory affected would move by water direct from Montesano; that the potential commerce and savings on commodities produced and consumed in Montesano alone (estimated to be less than 10 per cent of the total territory involved) would be as shown by the following table:

Annual saving on possible water-borne commerce in and out of Montesano only, based on production and consumption in 1924

Commodity	Amount produced or consumed in 1924 in short tons	Value	Rail rates to points usually shipped	Water rates per hundredweight	Possible yearly saving by water
Lumber	171,523	$3,120,000	Saving of lighterage, Montesano to Aberdeen of $1.50 per thousand feet board measure.		$106,609
Subject to lighterage charges.	106,609				
Shingles	37,120	542,400	Saving of lighterage, Montesano to Aberdeen of 20 cents per thousand.		36,251
Number of shingles, 180,800,000 (water shipment).	27,188		At $1.33⅓ per ton		
Cascara	900	165,759	$1.50 per hundredweight	$1.00	9,000
Canned goods	1,000		Saving of truck haul, Montesano to Aberdeen of 12 cents per case.		4,800
Dairy products	653		Saving of truck haul, Montesano to Aberdeen of $3 per ton.		1,960
Poultry products	3,500	334,016	do		10,500
Honey	100	30,000	do		300
Fuel oil	21,360	204,000			
Railroad delivery rate by tank cars Aberdeen to Montesano, $90 per 10,000-gallon car. Rate by barge or light tanker Aberdeen to Montesano, $55 for barge load of approximately 42,500 gallons. Rail rate equals cost of $0.009 per gallon. Barge rate equals cost of $0.001 per gallon. Saving affected is $0.008 per gallon, or $0.336 per barrel.					
Total saving affected by water haul.					40,320

Annual saving on possible water-borne commerce in and out of Montesano only, based on production and consumption in 1924—Continued

Commodity	Amount produced or consumed in 1924 in short tons	Value	Rail rates to points usually shipped	Water rates per hundredweight	Possible yearly saving by water
Gasoline	3,600	180,000	One-half cent per gallon differential account rail haul Aberdeen to Montesano.		4,500
Sugar	400	64,000	Saving of truck haul, Aberdeen to Montesano of $3 per ton.		1,200
Total possible yearly saving by water shipment.					235,471

1924 schooner shipments from Montesano, 17,360, 698 feet board measure.
1925 schooner shipments from Montesano to June 1, 1925, 18,639,302 feet board measure.
This amount has been included in totals of lumber production.

That the annual savings ($235,471) for this limited territory capitalized at 6 per cent would represent nearly $4,000,000 which the Government might profitably spend on the improvement and that this would be probably over five times the cost of the work; that this annual saving would pay for the cost of the work in four years; that competition would force much of this saving to be reflected in the marketing price to the benefit of the ultimate consumer. That—

in any discussion relative to the improvement of Pacific Northwest ports it should be borne in mind that the country has not even begun the development of its raw resources, and while the present basic industry is lumber the potentialities for development of other industries in the territory tributary to the proposed port are vast and far-reaching. Probably the development of coal and of the paper and pulp industry are among the more important and more likely to be developed in the very near future.

Without question, the most extensive coal field in the Northwest lies just east of Centralia and Chehalis. Estimates by conservative mining engineers place the visible quantity of these deposits at over one billion tons. This coal can be mined and delivered to Montesano at not to exceed $4.50 per ton, and can come to Montesano at from $0.50 to $1 per ton cheaper than to any other Northwest port.

This low price of $4.50 per ton would enable Montesano to compete on a favorable basis with any port in the Northwest on the marketing of bunker and industrial fuel.

During the past year this district, specifically the Wynoochee River, has been under investigation by various paper concerns. Surveys effected show everything favoring the location of large paper industries, both from a standpoint of ample raw material and water conditions.

Transportation would be largely a determining factor in the establishment of such industries at this point.

That the amount of merchantable lumber in the area tributary to Montesano is over 10,000,000,000 feet board measure, and that a saving of lighterage or rail haul of $1.50 per thousand on 50 per cent of this would amount to $7,500,000. That—

The effect of this improvement will, as pointed out above, greatly reduce the cost of marketing the products of the port. It will also increase the amount of present commerce due to the fact that with better water transportation facilities there can be no question that sawmills and other woodworking plants, furniture factories, canneries, etc., will begin operations at Montesano, Elma, and the east end of Grays Harbor County generally.

For instance, at the present time a very appreciable percentage (estimated by some authorities as high as 50 per cent) of the berry and small-fruit crop in this territory is going to waste, due to the fact that Montesano is not on an equitable market basis with other ports. The competition in this business is so keen that Montesano canneries can not afford to absorb the truck or rail haul necessary to reach deep water. They must, therefore, limit their production to a very small market.

It is a very well known fact that the supply of good merchantable timber is becoming limited to a very few localities, of which this port is one. One of the largest logging operators near Montesano is obliged to ship his best logs to Puget Sound points, due primarily to the fact that the type of plants utilizing the best grades of logs can not operate in this locality because of unequal marketing conditions, due in turn to the extra expense of reaching water transportation. This increase in commerce will be almost entirely a matter of new business and in the case of woodworking plants alone, will decrease to an appreciable extent the cost of doors, sash, etc., to the ultimate consumer, by just that proportion of the cost that the manufacturer on Puget Sound is likely obliged to pay for hauling his logs from Montesano to his plant. There will evidently be a very distinct advantage accruing to the general public of the United States with the improvement of the Chehalis River, due to the fact that a large percentage of the building materials for the entire country come from this section of the country, and it is safe to predict that within a very short period of time, a still larger percentage of the total of lumber and forest products can come only from the territory affected by the requested improvement. This is due to the fact that Montesano is the center of one of the two or three remaining large stands of timber, and due further to the fact that active steps are being taken to perpetuate the lumber industry through reforestation, which will be more successful here than elsewhere, due to the favorable climate condition.

That with the draft of 14 to 14½ feet now available shipments are limited to the California markets while the greater part of the lumber shipped from Montesano is destined for Atlantic coast or foreign markets and must therefore pay lighterage or rail charges amounting to about $1.50 per thousand feet; and that the fact that full advantage is now being taken of the available depth to Montesano as well as the fact that large size vessels are now taking full cargoes at Cosmopolis, less than 11 miles away, indicates that the proposed improvement would be immediately utilized.

28. *Local cooperation.*—In the fiscal year 1916, 64,957 cubic yards were removed from the inner harbor by the United States dredge *Colonel P. S. Michie* at a cost of $7,496.12 with funds contributed by the port of Grays Harbor Commission, and during the fiscal year 1920 the port commission contributed $25,000 which was expended in connection with Government funds in removing 115,142 cubic yards near Grays Harbor City. In January, 1919, the commission agreed to undertake the future maintenance of this improvement to a depth commensurate with that obtained on the outer bar by the United States. Under that agreement about 5,787,000 cubic yards have been removed at an approximate cost of $549,000. About 7.8 miles of the channel 175 to 200 feet wide has been deepened to about 24 feet at mean lower low water.

29. In 1924 in order to permit the inauguration of steam schooner service to Montesano the Schafer Bros. Lumber Co. dredged about 45,000 yards of material at a cost of $4,795 from shoals in the river above Cosmopolis.

30. A large amount of sand and gravel for commercial use has also been removed from the river above Cosmopolis which has undoubtedly aided in maintaining the project depth.

31. No monetary cooperation is offered by local interests in connection with the improvement now requested, it being claimed that the district has been taxed to the full legal limit by the port of Grays Harbor in order that the port might carry out its agreement as to the maintenance of the channel in the inner harbor. A willingness is expressed to provide docks and terminal facilities as rapidly as new business justifies and attention invited to the work done by the Schafer Bros. Lumber Co. above referred to.

32. *Terminal and transfer facilities.*—At Aberdeen, Hoquiam, and Cosmopolis there are 20 sawmill wharves and 3 miscellaneous wharves privately owned and operated. There are two public wharves, privately owned but open to general use, and one railroad wharf similarly open to public use. The port of Grays Harbor has a terminal on its property between Hoquiam and Aberdeen with storage shed, two hammer-head cranes, 2 locomotive cranes, portable conveyors, etc., and berthing space for 5 vessels, each 420 feet long. These facilities are considered adequate for existing commerce.

33. At Montesano and Wynoochee there are 3 sawmill wharves owned by the Schafer Bros. Lumber Co., the only concern now operating on the river at that point.

34. *Water power, floods, drainage.*—The portion of the river under consideration is tidal and there is no possibility of water-power development. Floods of moderate height occur during the winter which overflow some of the lowlands bordering the river but nothing has been developed in connection with this examination to indicate that matters of flood prevention, land reclamation or drainage are of much importance or in any manner related to the improvement of the river for navigation.

35. *Discussion and recommendation.*—The improvement to a depth of 26 feet at mean lower low water asked for is with a view not only to providing for offshore shipments of lumber from the mills already operating at Montesano, but to making "Montesano the port for the entire Grays Harbor territory," as stated in the brief submitted by the Montesano Chamber of Commerce and the port of Grays Harbor, from which pertinent extracts giving the arguments advanced in support of the improvement are quoted above.

36. Waiving the inconsistency of providing a channel of greater depth in the Chehalis River to Montesano than is now authorized or has been permanently maintained over the ocean bar and in the inner harbor to Aberdeen and Cosmopolis, it is not believed that it is economically advisable to attempt to carry deep water inland to Montesano, even were it admitted that the broad general principle stated in the brief as to the establishment of deep-water ports inland and above well-established ports at or near the harbor entrance had been fully established. While examples in this country of improvements embodying this principle may be cited as having been apparently carried out successfully, at least so far as the handling of a large commerce is concerned (i. e., Houston ship channel and Sabine-Neches waterway), or as having been authorized or recommended (i. e., Hudson River to Albany and the San Joaquin River and Stockton Channel), the conditions at this locality can hardly be considered as comparable thereto. In those cases the new inland ports were located at large and flourishing cities, generally important railroad centers, where a large prospective commerce seemed fairly well assured, and in each case a large local contribution was offered and required. Montesano is but a small community, and the amount of reasonably prospective commerce is not large, consisting mainly

of lumber shipments from one concern. The estimated savings in freight charges as given are sufficiently large to justify a liberal cooperation, but the absence of any offer thereof leads to a doubt as to whether these savings are well assured. Some of the area claimed as tributary is also claimed by Olympia as tributary to that harbor were deep water provided as requested in a preliminary examination ordered by the same act as that authorizing this investigation. Mills already established on deep water at Hoquiam, Aberdeen, and Cosmopolis would, it is believed, continue to draw the greater portion of the timber supply from this watershed, and it may be questioned whether a differential in ocean rates on lumber shipments might not still exist against Montesano on account of the greater distance thereto and the narrow and somewhat crooked river channel. This delay and difficulty in navigation would be a still greater handicap to the development of a commerce of a general nature, which requires the locality to be made a port of call for regular liners running on schedule. Such a commerce of any considerable proportions has not as yet been developed at the existing deep-water ports at Grays Harbor, though it is hoped by local interests that the recent establishment of joint rail and water export rates for those ports by the transcontinental railroads equal to those in force for Puget Sound ports will facilitate such a development.

37. Both the original cost and the annual maintenance charges for the improvement desired would be very large, and in view of the situation as above outlined, this cost is believed to be wholly disproportionate to the general or national benefits that might accrue from the improvement.

38. The present condition of the channel to Montesano permits steam schooners with a cargo of about 1,000,000 feet b. m. of lumber to go out by taking advantage of the tide. While this does not permit direct shipments to Atlantic coast or foreign ports, it does provide for direct transportation to California ports at a differential of about 50 cents per thousand above the cost of shipment from the deep-water ports on this harbor and a saving of about $1 on the cost of lighterage, taking the figure of $1.50 for this cost, as given at the hearing. While a somewhat greater depth, probably about 15 feet at mean lower low water, would permit carrying full cargoes on the type of steam schooners in use for this trade, which draw about 21 feet loaded, and possibly part cargoes on certain types of vessels engaged in intercoastal and oriental trade, a channel of even this depth would be quite expensive both in first cost and maintenance. The benefits would probably be even more local and special than in the case of the larger channel.

39. I therefore report that in my opinion the improvement of the Chehalis River to a further extent than that now authorized by the existing project is not worthy of being undertaken by the United States at this time.

40. In compliance with law I further report that at the present time there are no questions of land reclamation, water power, floods, or other related subjects which could be coordinated with the desired improvement so as to lessen the cost or compensate the Government for expenditures made in the interest of navigation.

W. J. BARDEN,
Colonel, Corps of Engineers,
District Engineer.

[Second indorsement]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., March 15, 1927.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. While not as yet convinced of the advisability of the United States undertaking any improvement of the Chehalis River beyond that authorized by the existing project, the board recommends a survey to obtain additional information necessary in reaching a sound conclusion.

2. The report of survey should contain a further discussion of the increased commerce and savings in transportation costs which may be expected to result from a deeper channel, particularly as affecting the general public. Estimates should be submitted covering the cost of channels of various depths from 10 to 18 feet at mean lower low water and of suitable width.

3. There is inclosed, for the information of the district engineer, a transcript[1] of a hearing held by the board at which representatives from the locality submitted additional information. It is requested that this record be returned when it has served its purpose.

For the board:

HERBERT DEAKYNE,
Brigadier General, Assistant Chief of Engineers,
Senior Member.

SURVEY OF CHEHALIS RIVER, WASH.

SYLLABUS

The district engineer considers that the further improvement of the Chehalis River is desirable to the extent of providing a channel 150 feet wide by 16 feet deep to Montesano, provided local interests will pay one-half the cost of dredging, assume the work of maintaining the channel after completion, and provide a suitable terminal at Montesano, open to the public on equal and reasonable terms.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Seattle, Wash., November 22, 1927.

Subject: Survey report, Chehalis River, Wash.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).

1. In compliance with section 8 of the river and harbor act of March 3, 1925, and instructions contained in departmental letter[1] of March 22, 1927, the following report, with map, on survey of Chehalis River, Wash., is submitted.

2. Attention is invited to the report on preliminary examination submitted August 22, 1925, for a general description of the locality, the existing project, work done, present condition, and general discussion of the situation on this river. Attention is also invited to the proceedings[1] of the hearing before the Board of Engineers on Rivers and Harbors at Washington, D. C., March 15, 1927.

[1] Not printed.

3. Instrumental survey of that portion of the river between Cosmopolis and Montesano was made in May and June, 1927. This survey included cross sections of the river and probings to determine the nature of the material. The results of the survey are shown on the map submitted with this report.

4. Estimates of cost of providing channels 10, 13, 16, and 18 feet deep at mean lower low water and 150 feet wide with suitable widening at the turns and with a turning basin at the upper end have been made and are as follows:

(*a*) Channel 150 feet wide by 10 feet deep at mean lower low water:	
Dredging 410,000 cubic yards, at 25 cents	$102, 500
Engineering and contingencies, about 15 per cent	15, 500
Total	118, 000
(*b*) Channel 150 feet wide by 13 feet deep at mean lower low water:	
Dredging 816,000 cubic yards, at 24 cents	201, 500
Engineering and contingencies, about 15 per cent	30, 000
Total	231, 500
(*c*) Channel 150 feet wide by 16 feet deep at mean lower low water:	
Dredging 1,600,000 cubic yards, at 23 cents	368, 000
Engineering and contingencies, about 15 per cent	55, 000
Total	423, 000
(*d*) Channel 150 feet wide by 18 feet deep at mean lower low water:	
Dredging 2,160,000 cubic yards, at 25 cents	540, 000
Engineering and contingencies, about 15 per cent	83, 000
Total	623, 000

5. These estimates include 1-foot overdepth at full price and are based on the assumption that the material is composed of sand and gravel, except in the 18-foot channel, where the borings indicate that some rock may be found, and that the dredged material may be deposited within the limits of the river banks without danger of being washed into the dredged channel.

6. These conclusions are believed justifiable as the probings indicate sand and gravel and a large amount of such material has been dredged from shoals in this section of the river for use in road construction.

7. The river and tidal currents are not strong and it is believed that the heavy material to be dredged and deposited along the river banks will not be moved by these currents. Placing the material within the river banks will increase the concentration of the currents in the dredged channel and will aid in its maintenance.

8. The lower portion of the Chehalis River is not subject to floods although some flooding of banks occurs, but this is due to extreme tidal conditions, and not to river floods. The deposit of the dredged material within the river is therefore not objectionable from the standpoint of flood damage.

9. The tidal range at Hoquiam between mean lower low water and mean higher high water is 10.1 feet and at Montesano is about 9 feet. Therefore, the channels which are 10, 13, 16, and 18 feet deep at mean lower low water will provide depths at Montesano of 19, 22, 25, and 27 feet at mean higher high water and will probably be able to accommodate vessels with loaded drafts up to 18, 21, 24, and 25 feet, respectively, at high water. The present controlling depth to Montesano is 7 feet at mean lower low water and vessels drawing as much as 15 feet 6 inches have been taken to sea from Montesano during high tide.

10. A channel 10 feet deep at mean lower low water would accommodate the light-draft steam schooners engaged in California trade, and permit them to load full cargoes (1,400,000 feet b. m.). Such a channel, while it would somewhat facilitate the present vessel movement, would not accommodate the type of vessels engaged in intercoastal or offshore trade, nor extend the existing market.

11. A channel 13 feet deep at mean lower low water would permit full loading (2,250,000 feet b. m.) of nearly all the vessels engaged in the California trade, and part loading (1,500,000 feet b. m.) of the smaller vessels operating to the Gulf-Pacific ports and Hawaii. It would probably not accommodate any vessels operating offshore.

12. A channel 16-feet deep would permit full loading of vessels operating to California and of the smaller vessels engaged in trade with the west coast of South America and Hawaii. It would also provide sufficient depth to accommodate the smaller vessels engaged in the offshore and intercoastal trade when fully loaded and some of the larger of these vessels with part cargo. However, considerable care will be required in the handling of the larger class of vessels through the narrow channel as proposed.

13. A channel 18 feet deep at mean lower low water would not include any additional vessels to those served by a 16-foot channel, but would permit them to operate on a lower stage of the tide or to carry greater loads.

14. It appears from the above that no material aid to the commerce on the Chehalis River is to be expected from providing any channel with a depth less than 16 feet at mean lower low water and that the additional cost of increasing this to 18 feet is not commensurate with the resulting benefits. This conclusion is concurred in by local port authorities.

15. A channel 16 feet deep at mean lower low water would permit direct shipments of lumber from Montesano to the Atlantic coast and foreign ports by means of the smaller vessels operating to these ports.

16. Taking the year 1926 as a basis we find that in addition to the 38,479,000 feet b. m., of lumber shipped to California in lumber schooners, there were 18,277,000 feet b. m. of lumber and 7,420,000 pieces of lath lightered to Aberdeen from Montesano for shipment to the Atlantic coast and 22,509,000 feet b. m. of lumber lightered and 20,218,000 feet b. m. of lumber rafted to Aberdeen for export.

17. It is estimated that if a 16-foot channel had been available, it would have effected a saving of $1 per thousand feet b. m. on the lumber and lath shipped to the Atlantic coast, a saving of $1 per thousand feet b. m. on one quarter the lumber lightered to Aberdeen for export, and 50 cents per thousand feet b. m. on the lumber rafted to Aberdeen for export. (The rafted lumber was composed of heavy timbers.) This amounts to, in round numbers, a saving of $41,000. This estimated saving is based on the assumption that some of the vessels which operate to the Atlantic coast and the foreign ports would go to Montesano for lumber, notwithstanding the dangers and difficulties of navigating such large vessels in a narrow and crooked

channel. The saving in lumber shipments at the present time would accrue largely to the benefit of one concern.

18. On the other hand there is the possibility of the development of additional trade in farm products and pulp and paper. Montesano affords an excellent location for pulp and paper mills with better foundations than on the lower harbor and plenty of suitable water.

19. The manufacture of pulp and paper is rapidly developing and new mills are being built at a number of places in this district. Montesano has available a large supply of raw material for the manufacture of pulp, and the necessity of good foundations for paper mills makes this a better location than either Aberdeen or Hoquiam.

20. The benefits resulting from any further improvement of the Chehalis River would be largely local, and a large amount of cooperation should therefore be required in any work authorized.

21. The general benefit of providing additional harbor facilities on Grays Harbor, which will cause a general upbuilding of the community, which will be reflected in increased commerce, is believed sufficient to jusify further improvement, if sufficient cooperation is obtained.

22. I report, therefore, that in my opinion the further improvement of the Chehalis River to the extent of providing a channel 150 feet wide and 16 feet deep to Montesano is worthy of being undertaken by the United States provided local interests will cooperate to the extent of paying one-half the cost of dredging such a channel, assume the maintenance of the channel after completion, and provide a suitable terminal at Montesano, open to the public on equal and reasonable terms.

23. The estimated cost of such a channel is $423,000, one-half of which, or $211,500, would be paid by the United States.

24. The total amount of $211,500 should be made available at one time, so as to provide for the completion of the work under one contract.

JOHN S. BUTLER,
Major, Corps of Engineers,
District Engineer.

[First indorsement]

OFFICE DIVISION ENGINEER,
NORTHERN PACIFIC DIVISION,
Portland, Oreg., December 10, 1927.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The usable depths and the corresponding vessel drafts cited, under high-tide conditions and with the channel depths below mean lower low water plane discussed in the report above (par. 9), are believed to be over-estimated.

2. The survey shows that the first cost of a 16-foot channel will be about $423,000. This is a very large sum contrasted with the prospective benefits as they are seen by me. The proposed Federal share of the first cost, one-half, appears to be wholly out of proportion to national benefit likely to result. The $623,000 estimate of cost for an 18-foot channel based on the survey is much larger than the outside figure, $250,000, used by the proponents in advocating an 18-foot channel at the hearing before the Board of Engineers for Rivers and Harbors on March 15, 1927 (p. 27).

3. It is my opinion that the United States should limit its future participation in improvement of Grays Harbor and connected waterways to work at the entrance, and that no project should be adopted increasing Federal cooperation inside the entrance. Such a division of financial responsibility between the General Government and the port district would be in line with the recent trend at other ports similarly circumstanced, and would, in my opinion, be fair to both parties in the present case. The port district to which they belong and not the General Government, should be looked to by the people of Montesano for relief, if their project is a worthy one. The General Government's interest in Montesano and the waterway connecting it with Grays Harbor is reflected in the work at the entrance where the improvement provides for vessels that would reach Montesano if Chehalis River were deepened as desired. The district's interest in Chehalis River as part of its system of waterways is a direct one, and, it appears, the port district should be concerned, and charged with improvement of that waterway, along with other channels of the inner system. That the agreement of 1919 regarding division of costs between the United States and the district did not expressly cover extensions of the inner project is not considered a good argument against this view.

G. R. LUKESH,
Lieutenant Colonel, Corps of Engineers,
Division Engineer.

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