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Remarks by Brigadier General L.H. Foote,
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before the

Inland Empire Waterways Association
Yakima, Washington - 27 November, 1956

PROGRESS AND TRENDS OF THE
CORPS' COLUMBIA BASIN PROGRAM

I appreciate the privilege of again appearing before the Inland Empire Waterways Association on one of the occasions I have come to look forward to with genuine pleasure--your annual convention. Your Executive Vice President, Mr. Herb West, in inviting me to address this convention, suggested the subject "Progress and Trends of the Corps' Columbia Basin Program," which would seem to sum up our civil works activities and the direction they are taking as well as any I can think of.

We are at an interesting stage of development in the Columbia River Basin. To look back fifteen years, comparing that time with the present, we are prone to appraise what has been accomplished with satisfaction, if not complacency. But to look ahead and consider what yet remains to be done--and without too much delay if we are to keep abreast of regional requirements--satisfaction must give way to concern for the future and real urgency to get on with the development program. Paradoxically, none will deny that the progress that has been made in development of the Columbia Basin in such a short period of time is little short of miraculous. Yet, to maintain our economy on an even keel, bigger and better miracles will be needed.

I think most of you are familiar with the marked evolution planning for the development of water resources has undergone in the past few decades. From single-purpose, single-project approach to development of river basins we have advanced to multiple-purpose, multiple-project planning for optimum productive use of all our resources, distributing the benefits as widely as possible.

Today only truly comprehensive planning can be accepted. We look to all the benefits of water use and control--domestic and industrial supply, irrigation, navigation, flood control, power, recreation, fish and wildlife, and pollution abatement. Such planning must likewise consider other resources. Nor can it be disassociated from the fields of economic activity which give rise to the need for water resource development in the first place.

The Presidential Advisory Committee on Water Resources Policy has put it this way: (and I quote) The objective of planning should be the best utilization of all water resources from the time precipitation falls upon the land until the water again finds its way into the sea. (end of quote) Best utilization must

consider all the needs of the economy.

All of us must keep our eyes on the future in today's planning. As industry and commerce expand we must try to anticipate the services and facilities that will be needed to support the expansion. In some of our activities we all are necessarily concerned largely with the prices and markets and developments of the next year, or the next few years. But in the field of water resource development we must try to project our vision ahead not by years but by decades. It takes many years to put a major development project through the planning, design and construction stages and into operation. Every flood-control, waterway, harbor, or multi-purpose project is in a sense a prophecy, for it must be built to serve not just in the times and conditions in which it is begun, but in the times and conditions that will prevail when it is finished, and perhaps far into the future.

How accurately we hit the target in the foretelling of future events as to growth and regional requirements in planning, designing and building today's projects depends, of course, on our ability to profit from what we have experienced in the past--this and a wise interpretation of present trends, some of which are so pronounced as to be easily recognizable as a departure from the familiar pattern.

Before discussing these trends, however, let us consider the present status of development in order to better determine where we are--both as to actual accomplishment and what may be expected in terms of recent Congressional appropriations.

Taking its place as the third federal multi-purpose project on the main stem of the Columbia River, McNary Dam will be completed in December when the fourteenth and final generating unit is placed in operation. The two other completed federal projects, of course, are Bonneville and Grand Coulee. Chief Joseph is partially completed with six generators in operation. Although not a federal project, Priest Rapids Dam is in the initial stage of construction under supervision of the Grant County Public Utility District and when completed will be tied into the Northwest Power Pool.

With Bonneville and McNary completed, The Dalles Dam on the Columbia and Ice Harbor on the lower Snake under construction, and John Day Dam in the advance planning stage, our navigation program on the Columbia River system is well launched. John Day would provide the final link in the chain of dams providing slackwater navigation from tidewater, at Bonneville, to the Pasco-Richland area on the Columbia. Slackwater to Lewiston will be realized with completion of Ice Harbor and the other three authorized Snake River dams--Lower Monumental, Little Goose and Lower Granite.

Not so optimistic, however, is our flood control progress. This phase of the development program is sadly lagging. Of the approximately 27,000,000 acre-feet of usable storage at various sites throughout the basin envisioned in the

Columbia River 308 Report which is now under re-study, not more than 13,500,000 acre-feet now seem possible of attainment. This is not sufficient to control a major flood such as that of 1948. We are badly in need of upstream storage. The Clearwater River projects in Idaho, Bruces Eddy and Penny Cliffs, together would provide 3,700,000 acre-feet of storage to help overcome this deficiency. When our present review studies are concluded we will have the benefit of other pinpointed projects in the upper Columbia Basin as alternate storage possibilities.

With respect to power, it is clear that we must move faster if we are to keep abreast of regional requirements in this phase of development. We need additional firm power in larger amounts than is now being made available to the industries we already have in this area, and far greater blocks of power will be required to attract new industries and allow for healthy expansion and growth. This additional power can best be provided by a balanced system of storage and run-of-river projects.

Congress appropriated about \$88,000,000 for civil works construction during fiscal year 1957 to carry forward the development program in this region, again giving us the distinction of leading all others in civil works allocation, as in several years past. This is slightly more than we expended last fiscal year when \$85,000,000 was invested in civil works construction.

The Dalles Dam received \$47,000,000 for fiscal year 1957, the largest allocation for a single project. Chief Joseph Dam received \$9,500,000 and Ice Harbor got \$8,000,000 while McNary, now virtually completed, received \$4,500,000. These allocations are sufficient to keep these main-stem projects on schedule in accordance with our construction plan. Hills Creek and Cougar Reservoirs in the Willamette Sub-Basin, both of which are in the initial stage of construction, received \$2,125,000 and \$1,650,000, respectively.

For continuing the dredging project at the mouth of the Columbia River to obtain an entrance channel 48 feet deep and one-half mile wide, \$1,300,000 was allocated. Favorable weather and sea conditions materially aided dredging operations during the past season and only about 4,000,000 cubic yards of the total 19,000,000 cubic yards to be dredged to reach project dimensions remained when the "Essayons" completed its mission in October. Depths of 48 feet generally prevailed throughout the entrance channel, although material along the side slopes and in the overdepth part of the channel remains to be removed. Dredging will continue next spring and summer. Frequent condition surveys of the entrance channel will be made to observe the nature and extent of shoaling action. The need for construction of the authorized jetty to maintain the 48-foot channel will be determined after studies have been made, based on analysis of repeated condition surveys, and possibly on model studies.

Two other navigation projects at or near the mouth of the Columbia received appropriations. For channel improvement at Baker Bay, including a small-boat

basin at Ilwaco, Washington, \$70,000 was allocated. Skipanon channel received \$185,000 which will be applied to completion of a small-boat basin at Warrenton, Oregon.

Funds were included in the 1957 fiscal year appropriations for a number of navigation projects on the Oregon and Washington coast, including \$300,000 for a small-boat basin at Coos Bay in Charleston Harbor; \$444,000 for construction of a breakwater and anchorage basin at the mouth of the Quillayute River at LaPush, on the northern Washington coast; \$61,000 for Breakwater "C" at Westhaven in Grays Harbor; \$1,300,000 for continuing work on the Bayocean Peninsula in Tillamook Bay; \$225,000 for construction of Chetco Harbor on the southern Oregon coast; \$400,000 for a small-boat basin in Bellingham Harbor and \$116,000 for a small-boat basin in Blaine Harbor, both in northern Washington; \$120,000 for work in Everett Harbor on Puget Sound; \$130,000 for small-boat basins in Willapa River and Harbor on the southern coast of Washington; \$400,000 for a boat basin in Shilshole Bay, Seattle, including construction of a breakwater; and \$150,000 for a small-boat basin in Anacortes Harbor in the Puget Sound Region.

Flood control projects for which substantial appropriations were provided include \$300,000 for continuation of the Willamette River bank protection work at various locations in the Willamette Valley; \$400,000 for constructing levees and revetments and channel rectification on the upper Snake River in the Jackson Hole area of Wyoming; \$150,000 for channel clearing and rectification of Johnson Creek in Portland; \$100,000 for improvement of the Amazon Creek channel in Eugene, Oregon; and \$55,000 for revetment of the banks of the Snake River in the Malheur Improvement District near Weiser, Idaho.

More than half of the river and harbor and flood control projects which I have listed represent new starts for which we will require additional funds in the 1958 fiscal year to continue the work towards completion or, in some cases, to completion. In addition to these appropriations for construction, we received more than \$2,100,000 for planning and approximately \$10,500,000 for operation and maintenance work, of which about \$6,200,000 is for navigation, \$3,900,000 for multiple-purpose projects, and \$400,000 for flood control.

Planning funds in the amount of \$1,450,000 were received for the continuation of advance design work on John Day Dam on the Columbia River. We expect to complete preconstruction planning with this appropriation. Hence, this important main-stem project is progressing rapidly toward the stage of actual construction. I need not remind you that although John Day is authorized for construction by the Corps of Engineers, its future seems somewhat uncertain in view of recent developments. You will recall that an application for a preliminary permit on the John Day site has been filed with the Federal Power Commission by Klickitat County Public Utility District No. 1. Also, the Portland General Electric Company and the Pacific Power and Light Company have indicated their interest in John Day as a partnership project. However, these developments have had no

effect on the planning work which is being pushed as rapidly as possible.

An allocation of \$200,000 was received for planning and design work in connection with Green Peter Reservoir on the Middle Santiam River. The general design work will be carried to approximately 50 percent of completion with these funds. Holley Reservoir on the Calapooya River, another unit of the Willamette Valley Flood Control Project, received \$100,000 with which to initiate planning. Preconstruction planning for Holley Reservoir will require about two years for completion.

In addition to these larger projects in the planning stage for which appropriations were received, one small navigation project--Columbia River at the Head of Sand Island-- and 22 flood control projects, primarily of local interest, in scattered portions of the Columbia River Basin received allocations, ranging from \$5,000 to \$50,000 or more each.

The last Congress also appropriated \$1,400,000 for the Columbia River Fishery Development program. These funds have been transferred to the U. S. Fish and Wildlife Service which will have administrative charge of the program concerned with the construction and maintenance of fish hatcheries and stream and fish passage improvement.

I should like now to discuss briefly some of the trends that have developed recently having a direct bearing on our water resources program. While all of them are not as yet so sharply defined as to represent a permanent break with the past, some of these trends do indeed indicate a definite departure from the familiar pattern and must be recognized if our planning is to be truly realistic.

One example which all of us have noticed is the tendency for agencies other than federal to embark on major construction enterprises to provide hydroelectric power in large quantities. In the past, private utilities in this region have for the most part confined their programs to developing power on smaller streams and tributaries while purchasing a large part of the power they distribute from the Federal system. Now they are more interested in constructing their own large projects--in some instances by forming combines with other companies, or through partnership arrangements with the federal government, as well as by contracts with Public Utility Districts. The PUD's themselves are currently very active in financing and constructing major hydroelectric projects. Some of us used to hold the opinion that only the U.S. Government could finance and build large projects like Priest Rapids, but the federal construction agencies are no longer alone in this field.

I think there is a definite trend, on a national scale as well as in this region, towards giving greater recognition to the importance of waterway improvements. Waterborne commerce in the United States reached a new all-time record during 1955, exceeding a billion tons for the first time in history. The total was

1, 016, 000, 000 tons as compared with 867, 600, 000 tons in 1954, and ten percent greater than the 924, 100, 000 tons in 1951, the previous record year. In addition, the ton-miles of freight carried on our inland waterways reached a new high of over 216 billion in 1955, compared with 173 billion in 1954, and 202 billion in 1953, the previous record year. Every year piles up fresh evidence that waterways are coming into their own. The Wall Street Journal recently compared the contemporary rush to the river banks with that of the early days of American history when canal and rivers formed the principal routes to the interior. Our own area is sharing in this "rush to the river". The Columbia and Lower Willamette River ports reported a total of 19, 800, 000 tons in 1955 as compared with 17, 700, 000 tons in 1954.

There is an increasing recognition of the importance of water supply, and the problem of meeting future water supply requirements is one of considerable concern to us of the Corps of Engineers. We are anxious that authority and means be provided whereby Corps development of water resources might be shaped so as to enable us to provide maximum assistance to this and other regions in meeting their needs in this regard just as we are now authorized to do for flood control and navigation. Under present laws we are permitted to consider water supply, but only when it is reasonably associated with the specific purposes of the study we are making. This gives us a basis for such water supply planning as we are currently engaged in. Water supply will undoubtedly be one of the most important factors in attracting new industries in the future.

There is a noticeable trend toward placing more emphasis on thermal power generation as it becomes increasingly clear that our resources are limited for producing hydroelectric power, compared with the estimated 1975 load demand. And there is a corresponding interest in the possibility of nuclear development of power. The power studies we are making in our review survey take into account the part that thermal generation may be expected to play in the immediate future of supplementing the hydro power capabilities of the Columbia Basin in meeting the continued load growth.

In planning projects it has long been our policy to consult with the fishery interests in matters relating to fish conservation. But recently we have succeeded in establishing a better working relation, not only with fishery interests but also with wildlife groups and recreationists, based on real understanding and full appreciation of each others problems. Gradually the old controversy of "fish vs. dams" is subsiding and a more reasonable attitude of mutual endeavor to solve common problems is taking shape. Not even the most dedicated conservationist will tell you today that engineers are interested only in building dams and care nothing about the preservation of fish and wildlife. By inviting the fish and wildlife interests to participate in the planning of our development program--as in the Corps of Engineers' present review studies--we have been able to secure the valuable assistance of these interests in solving conservation problems.

We are engaged in a program of research to discover more economical and effective facilities for the up and downstream passage of fish at dams. The investigations are being made by the district offices of the Corps, state fisheries agencies, universities, and the Fish and Wildlife Service under contract with the Corps which is supervising the program. Technical advisory committees composed of directors of research for the State and Federal fisheries agencies, assist in coordinating the program, estimated to cost \$2,500,000. Approximately \$2,000,000 has been expended or is under contract. The investigation has now reached a point where results, although not final, are beginning to be evident. All possible methods of directing downstream migrants to safe passage at high dams have been considered. Electrical current and light have been shown in field tests to have distinct possibilities of success. Gradient and capacity tests made at Bonneville indicate that a definite criteria for more economical and effective fish ladders will be worked out. Other investigations, such as the use of surface currents to attract downstream migrants, are under way and it is anticipated that the efficiency of artificial spawning areas to replace unavailable spawning grounds or expensive hatcheries will be tested. Present developments in this program offer great promise of more definite and economical standards for fish facilities and give reason for optimism as to the solution of the problem of maintaining fish runs at high dams which has been of so much concern to both fisheries and power interests.

Progress is being made in solution of the problem of benefits for power downstream from headwater storage--a problem that has been under study and evaluation for some time. The regional office of the Federal Power Commission in 1952 formed the Headwater Benefits Committee to evaluate the problem in accordance with an order of the Commission and pursuant to Section 10(f) of the Federal Power Act. This group, comprised of representatives of federal agencies and public and private power interests in the Columbia Basin concerned with power development, just recently reached an agreement on values for the power actually generated from headwater storage at downstream plants for the 1949-1954 period. This agreement, however, is yet to be approved by the Commission.

In addition, the Engineering Committee of the Pacific Northwest Governors' Power Policy Committee has undertaken the study of headwater benefits with a view of considering not only the domestic but also the international aspect of the problem. Their efforts will result in a report and recommendation for solution.

The Corps of Engineers in its review of House Document 531 on the Columbia River and Tributaries is considering this same problem and will probably include some comments on headwater benefits in its report which will be completed in the fall of 1957. In arriving at any conclusion, however, you may be sure it will be only after full collaboration with other federal agencies concerned. Difficult and controversial though it is, involving several interests with conflicting views, I believe that with the best talent of the region working on the problem a satisfactory answer will be found.

With regard to the Canadian portion of the Columbia River Basin, intensive studies are being conducted for the first time to develop this untapped resource. The Columbia River and its tributaries in Canada represent 15 percent of the total drainage area and produce nearly 30 percent of the annual runoff. In 1948, when the Columbia River Review Report was being prepared, there was little active interest in water resource development in the Canadian portion of the basin. Since that time, however, the continued growth of the United States portion of the Columbia Basin, due primarily to the availability of low cost power, has focused Canadian attention on their potentials. Various interests in the United States, seeking additional power for their needs, also added considerable impetus by offering to undertake developments in Canada themselves.

As a result, the potentials in Canada are now under intensive study by the Canadians. Also, studies directed by the International Joint Commission back in 1944 to determine the best plan for development of the water resources of the Columbia River Basin from an international point of view have been revitalized and are now scheduled for completion within two years. The active international interest in one possible development in Canada--the diversion of Columbia River water into the Fraser, thus reducing the water that would be allowed to pass downstream into Grand Coulee and on to the sea--resulted in discussions last April between Canadian Prime Minister St. Laurent and President Eisenhower. In short, the eventualities of Canadian development in the Upper Columbia are now very real. The immediate effect of this activity has been the deferment of the Libby project until Canadian plans for development of the Kootenay and Columbia Rivers in Canada have been firmed up. From the Canadian point of view, this is necessary to permit the Libby project to be integrated, if it can be, into the over-all plan. They also desire to await a necessary international agreement on the sharing of benefits that will result in the United States from use of Canadian resources.

The rapidly moving situation also makes it imperative that any development plans which are worked out for the United States give careful consideration to the possible Canadian developments. Until their plans are finalized, however, United States planning is necessarily complicated. That is the position in which we find ourselves today in our current review investigation.

I am sure you will be interested to learn that in our current review studies we are considering revised navigation benefits. Long range forecasts generally err on the conservative side, and this is true of our estimates of navigation benefits on the Columbia and Snake Rivers. Accordingly, in our re-study we shall include revised navigation benefit estimates for the Columbia and Snake River projects. The revised estimates are substantially greater than present estimates in House Document 531.

We profited immensely from the public hearings on our review studies held last July and we will hold additional public hearings next spring. Many of the projects included in our review were given active support in our July hearings,

although in some cases with reservations. Opposition to some projects was expressed. For example, at our hearing in Missoula, testimony was presented in opposition to the Swan River project in western Montana on the basis of displacement of farms and major disruption of the local economy. Ninemile Prairie Project on the Blackfoot River in Montana, on the other hand, was well supported.

At the Boise hearing, strong opposition to the Marsing Project on the Snake River was voiced because of irrigated and potential irrigable lands that would be inundated by the reservoir. At the same hearing it was urged that adequate consideration be given to water resource problems in the Upper Snake River area and that the study be combined with the Columbia River Review. Protection of fish and wildlife resources was urged at all the hearings, including those at Lewiston, Spokane and Portland.

In accordance with testimony and data presented our studies on all potential projects will continue, with the exception of Swan River and Marsing. These two projects have been dropped from the active program. We will continue to coordinate our studies with all interests--Federal, State and other agencies and interested groups. As the studies develop, our policy of maintaining maximum reference to the general public will be emphasized so that the final report will adequately reflect the views of the people residing in this region.

With your help, and the help of other interested organizations throughout the region whose services we highly value, we shall endeavor to serve you in the future as we have in the past in the sound development of water and related resources--geared realistically to the expanding economy of this great river basin.