# LIBBY DAM and Reservoir 

## FEDERAL MULTIPLE-DEVELOPMENT PROJECT ON THE

## KOOTENAI RIVER N.W. MONTANA




## PROJECT DESCRIPTION

Libby Dam and Reservoir, a multiple-purpose project planned on the Kootenai River in northwestern Montana, is a key element of the compre hensive plan for development of the Columbia River Basin in the interest of flood control, power generation, recreation and related water uses.

The dam will rise about 420 feet above bedrock, be 2900 feet long at the crest, and will include a hydropower plant with an initial installation of four 105,000-kilowatt generators and provisions for four additional units. The resrvoir, with gross storage capacity of $5,850,000$ acre-feet, will be 90 miles long, backing water 42 miles into Canada, approximately 5 miles upstream from Wardner, British Columbia. The normal full-pool elevation at the dam will be 2459 feet above mean sea level and the minimum elevation will be 2287 feet.

Within the United States, construction of the dam will require relocation of about 60 miles of Great Northern Railway's main trans-continental line, 52 miles of Montana State Highway 37, 50 miles of Forest Service roads, and relocation or adjustment of other facilities and utilities and services affected by the reservoir In Canada, a few communities, roads, and section of a branch-line railroad will be affected by the reservoir.

The total cost of the project will be about $\$ 352,000,000$, based on 1966 prices.

The project will provide 4,965,000 acre-feet of usable storage for downstream flood protection and power generation. It will afford almost complete flood protection for communities downstream lete flood protection froy, Mont and Bonners from the dam, such as Troy, Mon 000 , and Bonners erry, Maho, and for about 34,000 acres of fer ile valley in the Kootenal Flats in Idaho, as well as la Columbia. This storage in conjunction with
$8,450,000$ acre-feet of future Canadian storage to be provided under terms of the treaty with Canada for development of the Columbia River, will also be a major element in controlling floods to safe limits on the lower Columbia River below Bonneville Dam. Under initial conditions the project will regulate the stream flow to result in production of about 544,000 kilowatts of prime power at the dam and at existing and future installations on the Columbia River in the United States. This flow regulation will also increase the power production of existing and future plants on the Kootenay River in Canada between Nelson and Castlegar, B. C.

## AUTHORIZATION

The Libby Dam and Reservoir project was authorized by the 8lst Congress in 1950. Preliminary planning started in 1952 and was substantially terminated in 1954. Planning was reactivated in April 1961 after ratification by the Congress of the United States of the treaty with Canada relating to international cooperation in water-resource development of the Columbia River Basin. The treaty was consummated September 16, 1964, beside the Peace Arch at Blaine, Washington, with a formal exchange of instruments of notification by the two Governments.

The treaty provides that the United States may commence construction of the Libby project within five years from the treaty's effective date, and that operation of the Libby storage shall commence within seven years after beginning of the project' construction.

## SCHEDULE

The Corps of Engineers started construction of Libby Dam Project in 1966. The first work is on relocations of the Great Northern Railway line and the perimeter roads along the reservoir. Construction of the dam will also begin in 1966. The
harvesting of merchantable timber within the resrvoir will begin in 1966 and extend over about a five-year period.

## RELOCATIONS

Publicly-owned roads and utility systems, as well as privately-owned railroads and utility systems affected by Libby Dam construction will e provided for in relocation agreements beween the Federal Government and the respective wners. The owners' interests will be fully recognized and they will be equitably compen sated as required by existing law. In the case f roads, railroads, power and telephone lines there will be close coordination between the owners and the Federal Government to serve the owners ic interest by providing a replacement facility as nearly equivalent to the existing facility as will be feasible. Relocation contracts have been entered into with the Great Northern Railway Company and the Montana State Highway Commission. Negotiations are being conducted with the U. S. Forest Service and public and private util ities. Relocation will be accomplished with a minimum of inconvenience to residents of the area.

Cemeteries and graves within the reservoir area will be relocated if surviving relatives or responsible groups or individuals desire that they be relocated. The selection of new sites, disinterment and reinterment of remains, and transferring of monuments will be accomplished in close coordination with relatives, responsibl local individuals or ministerial groups or other recognized organizations.

The Government will acquire properties within the reservoir in accordance with the general procedure described in the paragraph following on land acquisition. In addition to payment for lands and improvements, owners will be compensated for moving or resettlement costs to the full extent permitted by law.

WHY THIS DAM?
lood waters have no respect for houses or highways, farmlands or factories, State or National orders. The Kootenai has a record of causing millions of dollars of damages by its many overflows through the years, in Montana, Idaho and British Columbia. The Kootenai is a main tributary of the Columbia, therefore any unrestrained high flows coming down from Canada and going on into the Columbia have added to the flood problems along that iver's main stem between Washington and Oregon.

Libby Dam will turn this loss into benefits through flood control, power production, recrea-


FOR THE PUBLIC
Jur rapidly-expanding population, with more isure time, more purchasing power, more mobility continues to seek more opportunities to enjoy the outdoors. The demand for outdoor recreation consequently has become greater each year. From 54 Con-person visits in 1954, attendance at Corp gineers projects increased in ten years to 143 million. The public's desire is a strong trend to the use of water areas, including lakes or reser-
voirs formed behind power and flood-control dams. Full consideration is given to public outdoor recreation as a purpose in the planning of water-resource-development projects by the Army's Corps of Engineers. Along with flood control, power, and other benefits, recreation is a major item in the Libby Dam and Reservoir Project. We are cooperating with other Federal, State, and local agencies in planning the development of Libby Res ervoir for extensive recreation use.
tion and other uses. By conservation and regulation, Libby Dam will provide water which will augent low-season river flow in the Columbia and res to navigation, irrigation, additional generation at downstream power plants, and other benefits.

British Columbia Hydro and Power Authority is constructing three large storage dams, Duncan, Arrow and Mica, under provisions of the Columbia River Treaty between the United States and Canada This notable water-resources-development treaty requires Canada to provide $15 \frac{1}{2}$ million acre-feet of live storage to help control the Columbia's flood waters and permit greatly-increased power generation at United States plants downstream. Both countries benefit.

COLUMBIA RIVER DEVELOPMENT



## LAND ACQUISITION

Approximately 43,000 acres of land will be required for all features of the project, such as dam site and construction areas, lands for the reservoir, lands for relocations of utilities, roads and highways and the Great Northern Railway. Of this area, about 13,000 acres are Federally owned, the remainder being in State, County and private ownership.

Corps of Engineers personnel have obtained and will renew temporary rights from landowners in the project area for surveys and sub-surface explorations. Generally, no money is paid for these temporary rights; however, any damages caused by the Government crews will be compensated at the termination of the temporary rights.

Under normal conditions, the reservoir area will be acquired by outright purchase to the fullpool elevation of 2459 feet above mean sea level, plus a lateral distance of approximately 300 feet to provide for adverse effects of saturation, wave action and bank erosion.

Periphery lands also will be acquired for permanent structures at the dam, for public access and recreation and for operation and maintenance of the project. An effort will be made to purchase privately-owned land along normal subdivision lines to avoid leaving useless isolated portions.

As a result of appropriation of construction funds by the Congress, actual purchase of private-ly-owned lands required for the project will begin in 1966 and should be completed within three years. Correspondingly, flooding of reservoir lands could begin in 1972.

Private property will be acquired only upon payment of just compensation. It is the policy of the Corps of Engineers to acquire lands and easements by purchases negotiated directly with the landowners. Condemnation proceeding will be used only as a last resort. Owners may use their own
appraisers, attorneys, real estate men, or others to advise them during negotiations.

Preliminary estimates indicate that approximately 1,000 separate tracts of land will be involved in the dam site, reservoir and necessary road and railroad relocations, the majority of which will lie in the reservoir area.

The Corps of Engineers desires that people in the vicinity of Libby Dam, particularly those whose lands will be required for the project, have full information about the project and land-acquisition program. To that end, information pamphlets were issued and public meetings were held on the land-acquisition program in 1965.

## RECREATIONAL PLAN

A master plan for recreational development in the reservoir area will be prepared by the Corps of Engineers and the U. S. Forest Service. Other Federal, State, and local agencies will be consulted at various stages of development of the plan.

The Corps of Engineers will have primary responsibility for accommodations for visitors at and near the damsite. Because the remainder of the 48 -mile-long reservoir area in the United States is within the jurisdiction of the Kootenai National Forest, the Forest Service has been assigned responsibility for the development of the recreation potential of the reservoir and adjacent lands.

When the preliminary recreational planning is completed, the Corps of Engineers and the Forest Service will hold one or more public hearings to inform and advise all interested persons about the proposed plan and afford them an opportunity to suggest possible modifications and to discuss recreation problems which are of mutual concern.

The master plan will give first priority to the recreational needs of the general public. Planning will provide for swimming, boating, fishing, hiking, picnicking, and camping facilities. Boats, boat docks and services, restaurants, overnight and
vacation accommodations, and similar services which the plan shows as being essential for public use of the area and are not supplied by the Government agencies, may be provided through concession leases to private individuals or organizations.

Consideration will be given to development and management of public parks in the reservoir area by local governmental agencies. The plan will provide for coordinated multiple-use management of all resources in the area to assure protection of lakeshore and scenic recreational values so that visitors will have the unique experience of enjoying a large forest-girded lake in a near-natural setting.


If additional information is needed at this time, phone or write the District Engineer, U. S. Army Engineer District, Seattle; 1519 Alaskan Way South, Seattle, Washington 98134. (MUtual 2-2700).


Lower Monumental lock and dam stand out sharply in a low December sunshine, and this Army Engineers' aerial view shows construction progress within the north-shore cofferdam. Perfect construction weather until the year-end holidays have enabled excavation down to bedrock in the powernorth
section.

 construction was delayed a few months by flood waters in December 1964 and April 1965.-(Ehoto LMNS 2002, Army Engineers's Seattle District)


CORPS OF ENGINEERS, U. S. ARMY<br>Office of the District Engineer SEATTIE DISTRICT<br>4735 E. Marginal Way<br>G. R. Bean, Information Officer<br>Seattle 4, Washington<br>NEWS RETEASE 10 April 1952

## PRRT, agh.--

Columbia River Constructors are expected to be moving men and equipment onto the site at Chief Joseph Dam where they will begin construction of the intake and powerhouse structures before the end of this month.

Award of the contract for this $\$ 39,749,997$ unit of the great power project on the Columbia River near Bridgeport was announced April 2 by Colonel John P. Buehler, Seattle District Engineer, Army Corps of Engineers.

Columbia River Constructors, a joint-venture concern made up of nine of the country's big contractors, will be close riverside neighbors to project's Chief Joseph Builders, another big combine, who have tha/ $\$ 27,000,000$ second-stage contract which includes erecting the spillway, abutments, second cofferdam, training walls, and stilling basin.

All of the intake and powerhouse construction will be on the south bank of the river. This job will require an estimated 720,000 barrels of cement, 800,000 cubic yards ( $1,600,000$ tons) of concrete, and 37,100,000 pounds of reinforcing steel. The intake structure, which will form part of the dem, will be 2,036 feet long. The powerhouse sub-structure will be 1,546 feet long, and the super-structure will be 1,336 feet long in this contract, providing space for 16 generating units. Eventually the powerhouse will be extended to 2,036 feet to accommodate the ultimate 27 units. This then will be the world's longest single straight-line hydromelectric powerhouse.

Work on this new contract, to be started this month, will be completed by July 1, 1956. The first four generators, however, with a rated capacity of 256,000 kilowatts ( 64,000 each), are to be putting electricity on the distribution lines by December 1955. Four generators will be added each year then until the presently-authorized 16 units are installed. When the ultimate 27 units are in, the rated capacity will be 1,728,000 kilowatts, making Chief Joseph Dam the world's second-largest producer of hydro-electric power, next to Grand Coulee Dam only 51 miles upstream on the Columbia.

Excavation in the powerhouse area at Chief "Joe" was stepped up by Chief Joseph Builders to an around-the-clock operation the last week in March, according to the Army Engineers. This work had been on a two-shift basis six days a week since last April. A total of more than $8,000,000$ cubic yards of rock and earth are to be removed on this project, a large portion of it from the powerhouse and intake area.

Placing of concrete was resumed last month by Chief Joseph Builders who are working a two-shift schedule six days a week building up the dam's right abutment and right training wall, and starting placing "mud" in forms for the spillway's left abutment on the south bank of the river. Work also is under way again on the earth fill on the north-end "wrap-around".

The steel-celled upstream arm of the second cofferdam, on the south side of the river, was joined to the completed center arm last week. The downstream a rm is expected to be in place by this week-end, the Corps' resident engineer at the dam, C. H. Wagner, reported. This will enable dewatering of the area to begin next week and excavation to be under way the following week to clear the solid-rock foundation for the second section of the spillway.

The various phases of construction on this massive project are up to schedule, according to the Engineers. The water, always a concern, has been
holding safely below flood stage, the volume fluctuating between 60,000 and 70,000 cubic feet per second. Velocity of the Columbia through the first spillway section is around 25 miles an hour.

Employment by the Chief Joseph Builders is up to approximately 800 this week, a fast, stedy climb since February. Start of the powerhouse contract this month by Columbia River Constructors will bring in many more workers. Employment rolls of the two contractor groups are expected to total up to a round 2,000 by late summer.

The construction firm of Chief Joseph Builders is made up of L. E. Dixon Company, San Gabriel, California; the Arundel Corporation, Baltimore, Maryland; Hunkin-Conkey Construction Company, Cleveland, Ohio; and American Pipe and Construction Company, South Gate, California.

In the Columbia River Constructors are Morrison-Knudsen Company, Inc.; Peter Kiewit Sons' Company; General Construction Company; Henry J. Kaiser Company: Macco Corporation; Walsh Construction Company; B. Perini and Sons, Inc.; Puget Sound Bridge and Dredging Company; and MacDonald, Young and Nelson, Inc.
otal foverment fivestment in chief foseph Dam when completed is estimated to be $\{206,000,000$.


PUBLIC NOTICE NO, P-63-141

Revised application has been received by the U. S. Army Engineer District, Seattle, from the WASHINGTON STATE HIGHWAY COMMISSION, HIGHWAYSLICENSES BUILDING, OLYMPIA, WASHINGTON, for approval by the Department of the Army, in accordance with the General Bridge Act of 1946 , of the PLANS and LOCATION of a FIXED HIGHWAY BRIDGE it proposes to construct across the COLUMBIA RIVER at VERNITA, WASHINGTON This application will be considered at a public hearing to be held by the undersigned in the dining hall of the Bonneville Power Administration Midway Substation, near Vernita, Washington, at 1:00 P.M., 20 November 1963.

Plans submitted with the application (copies inclosed) show that the bridge will be situated approximately 0.3 of a mile upstream of the existing Highway 11-A ferry crossing near Vernita, Washington. The principal navigational span will provide a horizontal clearance of 250 feet, rather than the 200 feet, described in Seattle District Public Notice No. P-63-119, dated 7 August 1963. Minimum vertical clearances of 10 feet and 46 feet, respectively, will be provided above high water elevation 426 feet mean sea level, and low water elevation 390 feet mean sea level. Plans show the bridge will be a fixed structure with provisions for converting to a lift bridge, if future development of navigation on the Columbia River should require such action.

All interested parties are invited to be present at the above time and place, including representatives of Federal, State, county and municipal agencies, and those of commercial, industrial, civic, and transportation interests. They will be given an opportunity to express their views upon the suitability of the location and the adequacy of the plans of the bridge in relation to their effect on navigation, and to suggest changes considered desirable. Discussion will be limited to navigation and itt allied features.

The procedure at the hearing will be to first ask representatives of the applicant to explain the proposal. All interested parties will then be given an opportunity to speak. It is requested that the attendance register card which will be distributed at the hearing be filled in by
each person present, and that in furtherance of the procedure described above, those wishing to speak indicate on the card whether they will speak in favor of or in opposition to the proposal.

Oral statements will be heard, but for accuracy of record all important facts and arguments should be submitted in writing, as the record of the hearing will be forwarded for consideration by the Department of the Army. Written statements may be handed to the undersigned at the hearing or mailed to him beforehand.

Particular information desired from opposing interests is a dollar estimate of the losses to anticipated navigation that the bridge would create because of increased vessel operating costs, reduced sailing speeds or other delays, damages to vessels, tows or cargoes, modification of vessels to permit passage under the vertical clearances proposed, transfer of cargo to smaller vessels or to other methods of transportation, and other pertinent factors. Information is also desired as to possible modifications of the bridge plans that would eliminate or reduce these losses.

2 Inc1
Plans (back to back)


