U.S. Army Corps of Engineers • Bonneville Power Administration

Columbia River Treaty

History and 2014/2024 Review

The Columbia River Treaty between the United States and Canada has served as a model of international cooperation since 1964, bringing significant flood control and power generation benefits to both countries. Either Canada or the United States can terminate most of the provisions of the Treaty any time on or after Sept.16, 2024, with a minimum 10 years' written advance notice. The U.S. Army Corps of Engineers, the Bonneville Power Administration and B.C. Hydro, the agencies responsible for implementing the Treaty, are leading a multi-year effort to address post-2024 Treaty provisions. This effort is the 2014/2024 Columbia River Treaty Review.

History of the Treaty

The Columbia River, the fourth largest river on the continent as measured by average annual flow, generates more power than any other river in North America. While its headwaters originate in British Columbia, only about 15 percent of the 259,500 square miles of the Columbia River Basin is actually located in Canada. Yet the Canadian waters account for about 38 percent of the average annual volume, and up to 50 percent of the peak flood waters, that flow by The Dalles Dam on the Columbia River between Oregon and Washington.

In the 1940s, officials from both the United States and Canada began a long process to seek a joint solution to the flooding caused by the unregulated Columbia River and to the postwar demand for greater energy resources. That effort culminated in the Columbia River Treaty, an international agreement between Canada and the United States of America for the cooperative development of water resources regulation in the upper Columbia River Basin. It was signed in 1961 and implemented in 1964.

Hydroelectric Development on the Columbia River

Hydroelectric development of the Columbia River in the United States began with the construction of Rock Island Dam in central Washington, completed in 1932. A year later, the U.S. government began construction of Bonneville and Grand Coulee dams. These massive public works projects brought thousands of jobs, giving the region a much needed economic boost during the Great Depression. Bonneville Dam primarily provided power generation and navigation, while Grand Coulee provided flood control, irrigation and power.

When the Grand Coulee power plant came into service in 1942, there was little demand for the electricity. But the low-cost power available in the Northwest was soon used to attract manufacturing industries supporting the World War II effort, including the creation of support communities such as Vanport, Ore., just north of Portland, which housed shipyard workers. In addition, the economy and population of the Pacific Northwest grew rapidly during the postwar period. This growth spurred the construction of a number of federal and nonfederal dams on the Columbia mainstem and its tributaries.

However, these new projects did not and could not adequately address flooding concerns since they provided little storage. In 1948, a spring flood caused major damage from Trail, British Columbia, to Vanport, Ore. Vanport, the second largest city in Oregon at that time, was completely destroyed. The flood displaced 30,000 people from their homes and caused more than 50 deaths. The magnitude of the flood event served as a trigger for action and added a sense of urgency to international discussions of flood control. The United States and Canada collaborated to identify a preferred method – a coordinated development plan – that would address Columbia River Basin flooding and meet the region's increasing demands for energy.

International Joint Commission Studies

In 1944, the United States and Canada asked the International Joint Commission, an organization formed by both countries under the 1909 Boundary Waters Treaty, to investigate development of Columbia Basin water resources in Canada. The Commission established the International Columbia River Engineering Board to conduct technical studies in the basin, an effort that received added impetus following the 1948 Vanport flood.

Vanport flood of 1948

The Columbia Basin study, which took 15 years to complete, investigated a number of different dam sites on the Columbia-Kootenay system above the U.S.-Canadian border, as well as alternative development plans. At the same time, the U.S. Army Corps of Engineers began updating its master resource plan, which had served as the basis for U.S. federal development on the Columbia River. Both studies recommended the development of upriver storage on the Columbia River and its tributaries for economic and flood control benefits to both countries.

In addition to the technical studies, the International Joint Commission recommended principles for determining and apportioning benefits from the cooperative use of storage. In developing the principles, the Commission recognized that developing and operating Canadian storage would help regulate water flows. The regulated flows would allow a greater amount of useable energy and a higher level of dependable capacity to be generated at downstream power plants than was possible without Canadian

storage. This would ultimately enable the United States and Canada to serve greater power demands. At the same time, the regulation would greatly reduce peak river flows during the spring runoff (snowmelt season) and provide significant flood protection to river basin occupants in both countries.

Negotiations

On Feb. 11, 1960, direct negotiations began between U.S. and Canadian representatives on the selection, construction and joint use of specific hydroelectric projects.

Talks proceeded rapidly and on Jan. 17, 1961, U.S. President Dwight D. Eisenhower and Canadian Prime Minister John Diefenbaker signed the Columbia River Treaty. It would be more than three years, however, before President Lyndon Johnson, Prime Minister Lester Pearson and Premier W.A.C. Bennett would meet on Sept. 16, 1964, at the International Boundary at Blaine, Wash., and Surrey, B.C., to acknowledge legislative ratification of the Columbia River Treaty and its Protocol, which amplified and clarified certain aspects of the Treaty.

Treaty Governance

The Treaty called for two "entities" to implement the Treaty — a U.S. Entity and a Canadian Entity. The U.S. Entity, created by the President, consists of the Administrator of the Bonneville Power Administration (chair) and the Northwestern Division Engineer of the U.S. Army Corps of Engineers. The Canadian Entity, appointed by the Canadian Federal Cabinet, is the British Columbia Hydro and Power Authority (B.C. Hydro).

The Treaty also established the Permanent Engineering Board (PEB), set up by the two governments to monitor and report on the results being achieved under the Treaty. Additionally, the board assists in reconciling differences concerning technical or operational matters that may arise between the Entities. The U.S. Secretaries of Army and Energy each appoint a PEB member. The governments of Canada and British Columbia also each appoint a Canadian member.

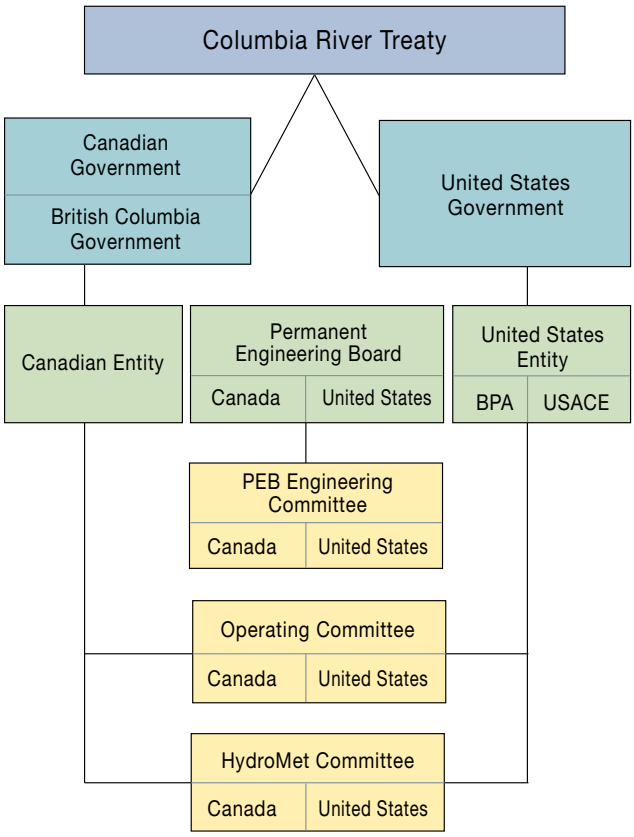
Mica Dam

Duncan Dam

Treaty Implementation

A main component of the Treaty called for Canada to develop reservoirs in the higher reaches of the Columbia Basin sufficient to provide 15.5 million acre-feet of water storage. To do this, Canada built three dams: Duncan (1968), Hugh Keenleyside (also referred to as Arrow) (1969) and Mica (1973). The Treaty also allowed the United States an option to build Libby Dam on the Kootenai River, a tributary of the Columbia River, in Montana. Construction on Libby Dam, whose reservoir Lake Koocanusa backs 42 miles into Canada, began in 1966 and was completed in 1973. Together, these four dams more than doubled the storage capacity of the Columbia River Basin at the time.

The Columbia River Treaty also requires the United States and Canada to prepare annually an Assured Operating Plan for the operation of Canadian Treaty storage six years in advance of each operating year. The Assured Operating Plan is developed to meet flood control and power objectives, the only recognized purposes for project operation when the Treaty was signed, and to define the amount of Canadian Entitlement to downstream power benefits to be delivered for that year. The Treaty allows the



Keenleyside Dam

Libby Dam

Entities the option to develop Detailed Operating Plans that may produce results more advantageous to both countries than the Assured Operating Plan. It permits the Entities to include fishery and other non-power objectives that provide mutual benefits. The Assured Operating Plan and the Detailed Operating Plan form the basis for the operating rule curves for Treaty projects in Canada. They provide the projected releases of water from those reservoirs crucial for coordinated system planning in the United States.

The Bonneville Power Administration markets power from the federal projects in the Columbia Basin in the United States while the U.S. Army Corps of Engineers oversees flood control matters and other major civil engineering works on the Columbia River. Under the provision of the Treaty, B.C. Hydro is responsible for the operation of the three Canadian Treaty dams.

Payment for Benefits

Sharing the benefits of cooperative water management was an integral part of the Treaty's design. The principle applied in the Treaty was to share these benefits equally. Thus, for flood control, Canada was to be paid 50 percent of the value of U.S. flood damages prevented. Instead of receiving an annual payment for the flood control benefits, Canada elected to receive lump sum payments totaling $64.4 million for one-half of the estimated flood control benefits through September 2024. In exchange for providing and operating the Treaty storage projects for power, Canada also received an entitlement to one-half of the estimated downstream power benefits generated in the United States.

Canada initially sold its share of this additional power for $254 million to a group of U.S. utilities for a period of 30 years, an agreement which expired in 2003 after which the Canadian Entitlement power from downstream benefits was fully delivered to the Province of British Columbia. The initial $254 million payment from U.S. utilities for downstream power benefits, together with the $64.4 million payment from the U.S. Government for flood control, helped fund the construction of the three Treaty dams in Canada.

Economic Impacts of the Treaty

The direct benefits of the Treaty in Canada and the United States include:

- On-site generation at Treaty dams (Mica and Keenleyside in British Columbia and Libby in Montana)
- Increase in dependable capacity at downstream projects in Canada and the United States from assured flows. (Dependable capacity is the load-carrying ability of a station or system under adverse conditions for a specified period of time.)
- Increase in firm energy and usable nonfirm energy at downstream projects in Canada and the United States. (Firm energy refers to the actual energy guaranteed to be available even in drought years. Nonfirm energy refers to all available energy above and beyond firm energy.)
- Flood damage reduction in both countries
- Cash payments and entitlement power for Canada

In addition, a number of other indirect economic benefits and developments were made possible by the Treaty. For example, other hydropower resources in both Canada and the U.S. Pacific Northwest may not have been developed without the Treaty. In British Columbia, Arrow Lakes Hydro project (2002), Revelstoke Dam (1984) and the Kootenay Canal plant (1975) were all made feasible by the streamflow regulation provided by upstream Treaty storage. In the United States, the Grand Coulee third powerhouse

and expansion of most downstream project powerhouses were enabled by the Treaty.

The Intertie

Because the operation of the new Canadian dams created additional power in the United States, with a sizeable portion of the Canadian Entitlement to flow to California, the Pacific Northwest-Southwest Intertie, a system of high-voltage transmission lines that carries large amounts of electricity, was built. The Intertie ensured that the Canadian Entitlement could be exported or resold in the California market during the early years of the Treaty implementation, when British Columbia and the Northwestern United States had no need for the additional power. The Intertie remains a vital component of the western-connected grid, providing enhanced reliability and power trading benefits to western Canada and the western United States.

PNCA Agreement

The Treaty also spurred development of the U.S. Pacific Northwest Coordination Agreement (PNCA), which helps optimize the operation of Pacific Northwest projects to take advantage of improved water flows from Canada. Under this agreement, most Pacific Northwest hydropower projects operate as though they were owned by one utility, taking advantage of the regional diversity in stream flows and power loads, as well as the ability to optimize all reservoir storage operations to one power load. Sixteen parties, including the U.S. Army Corps of Engineers, the Bonneville Power Administration and the Bureau of Reclamation, are members of the PNCA. First signed in 1964, the agreement has been renewed once since then and is now referred to as the 1997 PNCA.

The 2014/2024 Treaty Review

Over the years, the Columbia River Treaty has provided significant benefits on both sides of the border through coordinated river management. It remains the standard against which other international water coordination agreements are compared. The low electricity rates enjoyed both in the Pacific Northwest and British Columbia are due primarily to coordination benefits provided by the joint development and operation of hydroelectric projects within the Columbia Basin and the Intertie – all made possible by the Columbia River Treaty.

Either Canada or the United States can terminate most of the provisions of the Treaty any time on or after Sept. 16, 2024, with a minimum 10 years' written advance notice. Unless it is terminated, most of the provisions of the Treaty continue indefinitely. The terms

for flood control under the Treaty, however, will change automatically in 2024. After 2024, Canada will still be required to provide some operations for flood control in the United States whether or not the Treaty is terminated. However, the United States will be required to provide additional reimbursement to Canada for their lost power benefits and operational costs due to the requested flood control operations. If the Treaty is terminated, the United States will no longer be obligated to pay Canada its entitlement to one-half of the downstream power benefits realized in the United States.

Treaty Players and Decision Makers

While the U.S. and Canadian Entities were given broad discretion to implement the Treaty, they are not authorized to modify or terminate the Treaty. In the United States, the U.S. Department of State assists the U.S. government in foreign relations matters and is primarily responsible for international negotiations. The authority over international treaties rests with the President, who must seek the advice and consent of the U.S. Senate.

In Canada, international treaties are within the prerogative of the executive branch of the federal government. In some cases, a treaty may be ratified by parliamentary resolution. The Canada-B.C. agreement requires Canada to obtain the agreement of the Province of British Columbia before Canada issues a terminating notice for the Treaty.

Looking to the Future

For the life of the Treaty, both countries will enjoy flood control and power production benefits provided by regulating the water flow in the Columbia River. Since the Treaty was signed, however, circumstances in both countries have changed in areas influenced by hydro operations in the Columbia Basin, such as fish and wildlife, recreation, cultural resources, irrigation, navigation and water supply. Before studying these additional influences, it is important for both countries to better understand the power and flood control implications of continuing with or terminating the Treaty. Power and flood control are the only components recognized in the Treaty. Future studies will address the other uses of the Columbia River.

The U.S. and Canadian Entities are reviewing future scenarios regarding the Treaty. This joint effort has been named the 2014/2024 Columbia River Treaty Review. The Entities launched the first phase of the review with technical studies designed to establish rudimentary baseline information of what power and flood control operations might look like after 2024 with and without the Treaty. They are not designed to establish future strategic direction or policy. The first phase of studies should be completed around the spring of 2009, at which time BPA and the U.S. Army Corps of Engineers will host public workshops to discuss the initial findings and seek input on the direction for the second phase of studies.

This publication on the 2014/2024 Columbia River Treaty Review was developed to inform you of issues surrounding the Columbia River Treaty. It is published by the Bonneville Power Administration and the U.S. Army Corps of Engineers. For more information, call the Bonneville Power Administration at (503) 230-3000 or the U.S. Army Corps of Engineers at (503) 808-3700.

US Army Corps of Engineers

BONNEVILLE POWER ADMINISTRATION

April 2008