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MEMORANDUM

TO: Water Resources Commission

FROM: Ruben E. Ochoa, Water Policy Analyst

SUBJECT: Agenda Item C, November 15, 2012
Water Resources Commission Meeting

Information Regarding the U.S./Canada Columbia River Treaty and the Columbia River Treaty 2014/2024 Review Process

I. Issue Statement

This agenda item focuses on the U.S./Canada Columbia River Treaty 2014/2024 Review Process and covers the following five subject areas: 1) The Columbia River Basin – facts and figures; 2) The establishment of the U.S./Canada Columbia River Treaty; 3) Treaty provisions and operations; 4) The Columbia River Treaty 2014/2024 Review Process and Oregon's participation in the process; and 5) A look ahead.

One of the recommended actions to help ensure that Oregon can meet its instream and out-of-stream water needs, as described in Goal 2 of Oregon's Integrated Water Resources Strategy, is to partner with federal agencies, tribes, and neighboring states in long-term water resources management. Oregon's active participation in the Columbia River Treaty 2014/2024 Review Process represents a clear and direct manifestation of this recommended action.

II. Columbia River Basin – Facts and Figures

The Columbia River and its tributaries have been central to the region's culture and economy for thousands of years. They have been used for transportation since ancient times, linking the many cultural groups of the region. The river system hosts many species of anadromous fish, which migrate between freshwater habitats and the saline Pacific Ocean. These fish—especially the salmon species—provided the core subsistence for Native Americans.

The Columbia River drainage basin is roughly the size of France and extends into British Columbia and seven states in the United States (predominantly the states of Washington, Oregon, Idaho and Montana). It is home to fifteen U.S. Indian tribes and eleven First Nations in Canada.

The headwaters of the Columbia River are located in the Rocky Mountains of British Columbia. The river flows northwest and then south into and through the state of Washington, then turns west to form most of the border between Washington and Oregon before emptying into the Pacific Ocean. While its headwaters originate in British Columbia, only about 15 percent of the 259,500 square miles of the river's drainage basin is located in Canada. Yet the Canadian water accounts for about 38 percent of the average annual flow volume, and up to 50 percent of the peak flood waters, that flow in the lower Columbia River between Oregon and Washington. Most of the annual precipitation in the basin occurs in the winter with the largest share falling in the mountains as snow. The moisture that is stored during the winter as snowpack is released in the spring and early summer, and about 60 percent of the natural runoff in the basin occurs during May, June, and July.

The Columbia River is 1,243 miles long and its largest tributary, the Snake River, is 1,078 miles long. By volume, the Columbia is the fourth-largest river in the U.S., and with an estimated annual flow of 198 million acre-feet, it has the greatest flow of any North American river that drains into the Pacific Ocean.

The river's heavy flow and its relatively steep gradient give it a tremendous potential for the generation of electricity. The 14 hydroelectric dams on the Columbia's main stem and many more on its tributaries produce more hydroelectric power than the hydroelectric power generated on any other North American River.

Today, the Columbia River basin has more than 55 million acre-feet of reservoir storage, which represents 41 percent of the average annual flow as measured at The Dalles. This relatively small percentage of storage allows only limited control of the Columbia compared to other major rivers. The Missouri and Colorado, for example, have two to three times more storage than average annual flow.

III. Establishment of the Columbia River Treaty

The 1909 Boundary Waters Treaty established principles and procedures affecting U.S./Canada boundary waters and created a permanent International Joint Commission (IJC) to study and help resolve problems relating to the use of boundary waters. In 1944, Canada and the U.S. requested that the IJC determine "whether a greater use than is now being made of the waters of the Columbia River System would be feasible."

Detailed studies began after a 1948 flood severely damaged communities from Trail, B.C., to the lower Columbia and destroyed Vanport, the second largest city in Oregon at that time. At the time of the 1948 flood, total storage capacity of the Columbia was about 6 percent of the average annual flow. After more than a decade of analysis and discussions, the IJC reported its study results and recommended principles for determining and apportioning benefits from the cooperative use of storage. Guided by these principles, formal negotiations began in 1959 and culminated in 1961 with ratification of the Treaty by the U.S. government and in 1964 by the federal Crown for

Canada following parliamentary approval and agreement with the province of British Columbia.

Implementation of the Treaty has proceeded at the federal level in the U.S. through the appointment of the Administrator of the Bonneville Power Administration and Division Engineer of the Northwestern Division U.S. Army Corps of Engineers as the U.S. Entity, and in Canada through the appointment of British Columbia Hydro (BC Hydro) as the Canadian Entity.

IV. Columbia River Treaty Provisions/Operations

In general, the goal of the Columbia River Treaty is simple and straightforward: create upstream storage in Canada and then share the power and flood control benefits that are derived downstream in the United States. More specifically, the terms of the Treaty required the construction and operation of three large dams in the upper Columbia River basin in British Columbia and provided the U.S. the option to build a fourth dam in Montana with a reservoir that extended into Canada. The dams would create 15.5 million acre-feet of reservoir storage for hydroelectric power generation and flood control benefits in Canada and downstream in the United States.

Canadian storage projects and associated reservoirs developed under the terms of the Treaty include: Duncan Dam (Duncan Lake), which began operation in 1967, followed by Keenleyside Dam (Arrow Lakes), which began operation in 1968, and Mica Dam (Kinbasket Lake), which began operation in 1973. Libby Dam (Lake Kookanusa), constructed on the Kootenai River in Montana for flood control and other purposes in the U.S., began operation in 1972.

Hydroelectric Power Benefits

Under the terms of the Treaty, Canada agreed to provide in the Columbia River Basin in Canada 15.5 million acre-feet of storage for the purpose of increasing hydroelectric power generation in Canada and the U.S. In consideration for Canada's agreement for providing this storage, the U.S. agreed to operate projects in the U.S. to make the most effective use of the Canadian storage and to reimburse to Canada one-half of the estimated increase in downstream power benefits. The consideration due to Canada from the U.S. is commonly referred to as the "Canadian Entitlement".

Canada initially sold its share of the downstream power benefits to the U.S. for $254 million to a consortium of U.S. utilities for a period of 30 years. This agreement and subsequent extensions expired completely in 2003. Since then, the Canadian Entitlement is delivered by the U.S. on a daily schedule to the Province of British Columbia for Canada's use or resale. The current annual value of the Canadian Entitlement is estimated at between $250-$350 million.

Flood Control Benefits

Under the Treaty, the U.S. agreed to pay Canada $64.4 million for the assured use for 60 years and on an annual basis of 8.45 million acre-feet of Canadian Treaty project storage space for U.S. flood control. The assured flood control storage was subsequently raised to 8.95 million acre-feet. Use of this guaranteed annual space has been implemented in the Treaty Flood Control Operating Plans (FCOP). Last updated in 2003, the FCOP is part of a coordinated operation of U.S. and Canadian projects. The goal is to reduce to non-damaging levels the flows at all potential flood damage areas insofar as possible, and to regulate larger floods that cannot be controlled to non-damaging levels to the lowest possible level.

V. 2014-2024 Columbia River Treaty Review

The Columbia River, shaped by millions of years of steady and sometimes explosive geologic and hydrologic forces, has been altered in the relative blink of geologic time by human engineering. Implementation of the Columbia River Treaty has played a major role in the engineered alteration of the Columbia River. These alterations have provided significant and direct benefits from flood control and hydroelectric power and indirect benefits of economic growth to both Canada and the U.S. for almost 50 years.

Since the Treaty was signed, however, circumstances and interests in both countries have changed in areas influenced by Treaty-driven hydro operations that go beyond flood control and power generation, such as those associated with fish and wildlife, recreation, cultural resources, water supply, water quality, and navigation. Future and potentially significant impacts resulting from climate change has been joined to this expanding array of circumstances and interests—all of which are currently being analyzed in the 2014-2024 Columbia River Treaty Review Process.

Treaty Review – Why Now?

There are two primary reasons why the U.S. Entities (Bonneville Power Administration and the U.S. Army Corps of Engineers, Northwest Division) have engaged a number of northwest states, tribal governments, other federal agencies and the public in the 2014-2024 Columbia River Treaty Review Process:

1. The Treaty has no specified end date; however, either nation can terminate most of the provisions of the Treaty as early as September 16, 2024, with a minimum of 10 years' written notice, and

2. Canada's obligation to provide assured flood control storage will expire in 2024. This obligation shifts from the current assured amount of annual flood storage in Canada to a process that allows the U.S. to 'call upon' Canada for flood storage.

It should be noted, however, that under a situation in which the Treaty continues after 2024 (when assured flood storage ends), pre-coordinated power planning under Assured and Detailed Operating Plans will still continue. This will provide the U.S. detailed forecasts on available Canadian reservoir space from power drafts, reservoir releases, and flows at the border, thereby enabling the U.S. to develop a fairly specific annual plan for flood operations.

Also, it should be noted that some provisions of the Treaty continue indefinitely even if one party gives notice to terminate. The provisions that survive termination include Canada's obligation to provide "called upon" flood control on certain terms and conditions and the right of the United States to continue to operate Libby Dam and maintain the Koocanusa reservoir that backs up into Canadian territory. Termination is therefore something of a misnomer. In brief:

If the Treaty continues:

- Coordinated annual planning of an optimum U.S. and Canadian power operation continues.
- U.S. continues to deliver the 'Canadian Entitlement'.
- Certainty in Canadian storage operations through Treaty planning and coordination continues.

If the Treaty is terminated:

- B.C. Hydro will operate the Treaty projects (Mica, Keenleyside, and Duncan) for the benefit of Canada (subject to Boundary Waters Treaty), except for 'called upon' flood control operations. The U.S. will continue to coordinate with Canada on the operation of Libby Dam and Koocanusa reservoir.
- The Canadian Entitlement will cease to exist.

The dynamic created by possible Treaty termination in 2024 (by notice given in 2014) as well as the automatic changes to the flood control operations that will occur in 2024 has created both the opportunity, and perhaps the need, to take a broader look at the Treaty.

VI. The Treaty Review Process and Oregon's Participation

The stated purpose of the Columbia River Treaty 2014-2024 Review Process is "to enable the United States Entity and the regional sovereigns to make an informed recommendation to the U.S. Department of State as to whether or not it is in the best interest of the U.S. to continue the Treaty, terminate the Treaty, or seek to negotiate with Canada on amendment of the Treaty." To develop the informed recommendation, the U.S. Entity (Bonneville Power Administration and the U.S. Army Corps of Engineers, Northwest Division) have organized and established a Sovereign Review Team (SRT) and a Sovereign Technical Team (STT) and have undertaken a comprehensive iterative process to arrive at a final recommendation to be submitted to the U.S. State Department.

Sovereign Review Team (SRT)

The SRT is responsible for defining and overseeing the assignments given to the STT and the supporting U.S. Entity Treaty Review Study Team for both policy and technical matters. The SRT provides guidance to the STT concerning study scoping, alternatives, evaluation tools and methodologies, and refinement of preliminary recommendations. The SRT consists of the U.S. Entity Coordinators, who serve as co-chairs, SRT Staff Designees, and their Alternates representing:

- Regional states (Oregon, Washington, Idaho, and Montana)
- 15 NW Tribes (5 representatives – Upper Snake River Tribes, Upper Columbia United Tribes, Columbia River Inter-Tribal Fish Commission, Cowlitz, and Confederated Salish and Kootenai Tribes of Flathead Reservation), and
- 11 Federal Agencies (National Marine Fisheries Service, US Fish and Wildlife Service, Bureau of Reclamation, US Army Corp of Engineers, Bonneville Power Administration, Bureau of Land Management, Environmental Protection Agency, US Forest Service, US Geological Survey, Bureau of Indian Affairs, and National Parks Service)

Oregon's representatives to the SRT are Bill Bradbury and Henry Lorenzen, Vice-Chair and member of the Northwest Power and Conservation Council, respectively.

Sovereign Technical Team (STT)

The STT is comprised of technical staff designated by their respective sovereign. Based on direction from the SRT, the STT is responsible for the development of the study scope, alternatives, evaluation tools and methodologies, alternative impact assessments, documentation of results, and preliminary recommendations.

Oregon's representatives to the STT are Rick Kruger (Oregon Department of Fish and Wildlife) and Ruben Ochoa (Oregon Water Resources Department).

Technical Studies – Iterative Process

As noted earlier, the U.S. Entities have undertaken a comprehensive iterative process to assist the U.S. Entity and regional sovereigns in arriving at a final recommendation for submission to the U.S. State Department. The iterative process began with joint technical studies designed to develop baseline information to help understand what power and flood control operations might look like after 2024 with and without the Treaty. Subsequent efforts will involve three iterations of studies designed to progressively narrow the options and alternatives for consideration and development of a final recommendation to the State Department.

In general, the technical studies revolve around three primary operational drivers: hydropower, flood risk management, and ecosystem-based functions. Impact assessments of various alternative future operational scenarios on water supply,

recreation, navigation, cultural resources, estuary, and climate change are also being conducted. In addition, an assessment of opportunities for additional water supply from Canadian reservoirs for instream and out-of-stream uses in Washington and Oregon will be conducted.

Water Supply

An important and foundational Sovereign Participation Process document, approved by the SRT in July 2011, establishes the following objectives of the Treaty Review process for Water Supply:

- Assess the impacts (of alternatives) on the ability to provide current water supply reliability.
- Assess the opportunities for additional water supply from Canada for instream and out-of-stream uses for the Columbia River Basin, and
- Assess the impacts of effective use on instream and out-of-stream uses for the Columbia River Basin.

The states of Oregon and Washington have taken the lead in the SRT and STT to ensure that technical studies be conducted that provide meaningful information on the potential for accessing additional water from Canadian Treaty reservoirs for instream and out-of-stream uses. With regard to out-of-stream uses in Oregon, the objective of the study will be to meet the long-term water supply needs (agriculture, municipal, and industrial) in that area of the state (primarily the Umatilla River Basin) that could benefit from additional water supplies made available for diversion from the Columbia River. This effort is most clearly manifest in one of several water supply impact studies (Task 4) being performed by HDR, which is under contract with the Corps to do the following:

> Task 4: Develop and Assess Water Supply Components to be Incorporated into Post-2024 Treaty Alternatives.
>
> The contractor shall provide assistance to the Government in developing and assessing water supply components or scenarios that are tiered to Canadian Reservoirs into post-2024 Treaty alternatives. The components or scenarios would be based on Iteration 3 modeling, and as such would be scenario(s) that combine multiple uses such as additional water in spring and summer for environmental and water supply purposes. The contractor shall estimate the timing and suggested quantities of water that would be desired for water supply based on direction from the STT Water Supply Work Group. These requests are currently motivated by interests in Oregon and Washington State. The Contractor shall also provide an overview of the potential contractual/Treaty/commercial mechanisms and the river and storage operations needed to provide additional water.

VII. A Look Ahead

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. Any negotiations and outcomes of post-2024 Treaty issues will be handled by the U.S. and Canadian governments. In the United States, the U.S. Department of State is primarily responsible for international negotiations. The President of the United States and the U.S. Senate, with their constitutional authority over international treaties, will also have a role in making decisions concerning the future of the Treaty.

The U.S. Entities have committed to delivering a recommendation to the U.S. Department of State by September 2013 as to whether or not it is in the best interest of the U.S. to: (1) continue the Treaty; (2) terminate the Treaty; or, (3) seek to negotiate with Canada on modification or amendment to the Treaty.

Attachment 1: U.S./Canada Treaty and Protocol
Attachment 2: Columbia River Treaty Review Program Map
Attachment 3: Sovereign Participation Process

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The Columbia Treaty

Treaty between Canada and the United States of America relating to Cooperative Development of the Water Resources of The Columbia River Basin

The Governments of Canada and the United States of America

Recognizing that their peoples have, for many generations, lived together and cooperated with one another in many aspects of their national enterprises, for the greater wealth and happiness of their respective nations, and

Recognizing that the Columbia River Basin, as a part of the territory of both countries, contains water resources that are capable of contributing greatly to the economic growth and strength and to the general welfare of the two nations, and

Being desirous of achieving the development of those resources in a manner that will make the largest contribution to the economic progress of both countries and to the welfare of their peoples of which those resources are capable, and

Recognizing that the greatest benefit to each country can be secured by cooperative measures for hydroelectric power generation and flood control, which will make possible other benefits as well.

Have agreed as follows:

ARTICLE I
Interpretation

1. In the Treaty, the expression

(a) “average critical period load factor” means the average of the monthly load factors during the critical stream flow period;

(b) “base system” means the plants, works and facilities listed in the table in Annex B as enlarged from time to time by the installation of additional generating facilities, together with any plants, works or facilities which may be constructed on the main stem of the Columbia River in the United States of America;

(c) “Canadian storage” means the storage provided by Canada under Article II;

(d) “critical stream flow period” means the period, beginning with the initial release of stored water from full reservoir conditions and ending with the reservoirs empty, when the water available from reservoir releases plus the natural stream flow is capable of producing the least amount of hydroelectric power in meeting system load requirements;

(e) “consumptive use” means use of water for domestic, municipal, stock-water, irrigation, mining or industrial purposes but does not include use for the generation of hydroelectric power;

(f) “dam” means a structure to impound water, including facilities for controlling the release of the impounded water;

(g) “entity” means an entity designated by either Canada or the United States of America under Article XIV and includes its lawful successor;

(h) “International Joint Commission” means the Commission established under Article VII of the Boundary Waters Treaty, 1909, or any body designated by the United States of America and Canada to succeed to the functions of the Commission under this Treaty;

(i) “maintenance curtailment” means an interruption or curtailment which the entity responsible therefor considers necessary for purposes of repairs, replacements, installations of equipment, performance of other maintenance work, investigations and inspections;

(j) “monthly load factor” means the ratio of the average load for a month to the integrated maximum load over one hour during that month;

(k) “normal full pool elevation” means the elevation to which water is stored in a reservoir by deliberate impoundment every year, subject to the availability of sufficient flow;

(l) “ratification date” means the day on which the instruments of ratification of the Treaty are exchanged;

(m) “storage” means the space in a reservoir which is usable for impounding water for flood control or for regulating stream flows for hydroelectric power generation;

(n) “Treaty” means this Treaty and its Annexes A and B;

(o) “useful life” means the time between the date of commencement of operation of a dam or facility and the date of its permanent retirement from service by reason of obsolescence or wear and tear which occurs notwithstanding good maintenance practices.

2. The exercise of any power, or the performance of any duty, under the Treaty does not preclude a subsequent exercise of performance of the power or duty.

ARTICLE II
Development by Canada

1. Canada shall provide in the Columbia River basin in Canada 15,500,000 acre-feet of storage usable for improving the flow of the Columbia River.

2. In order to provide this storage, which in the Treaty is referred to as the Canadian storage, Canada shall construct dams:

(a) on the Columbia River near Mica Creek, British Columbia, with approximately 7,000,000 acre-feet of storage;

(b) near the outlet of Arrow Lakes, British Columbia, with approximately 7,100,000 acre-feet of storage; and

(c) on one or more tributaries of the Kootenay River in British Columbia downstream from the Canada-United States of America boundary with storage equivalent in effect to approximately 1,400,000 acre-feet of storage near Duncan Lake, British Columbia.

3. Canada shall commence construction of the dams as soon as possible after the ratification date.

ARTICLE III
Development by the United States of America Respecting Power

1. The United States of America shall maintain and operate the hydro electric facilities included in the base system and any additional hydroelectric facilities constructed on the main stem of the Columbia River in the United States of America in a manner that makes the most effective

use of the improvement in stream flow resulting from operation of the Canadian storage for hydroelectric power generation in the United States of America power system.

2. The obligation in paragraph (1) is discharged by reflecting in the determination of downstream power benefits to which Canada is entitled the assumption that the facilities referred to in paragraph (1) were maintained and operated in accordance therewith.

ARTICLE IV
Operation by Canada

1. For the purpose of increasing hydroelectric power generation in Canada and in the United States of America, Canada shall operate the Canadian storage in accordance with Annex A and pursuant to hydroelectric operating plans made thereunder. For the purpose of this obligation an operating plan if it is either the first operating plan or if in the view of either Canada or the United States of America it departs substantially from the immediately preceding operating plan must, in order to be effective, be confirmed by an exchange of notes between Canada and the United States of America.

2. For the purpose of flood control until the expiration of sixty years from the ratification date, Canada shall

(a) operate in accordance with Annex A and pursuant to flood control operating plans made thereunder

(i) 80,000 acre-feet of the Canadian storage described in Article II(2)(a),
(ii) 7,100,000 acre-feet of the Canadian storage described in Article II(2)(b),
(iii) 1,270,000 acre-feet of the Canadian storage described in Article II(2)(c),

provided that the Canadian entity may exchange flood control storage under subparagraph (ii) for flood control storage additional to that under subparagraph (I), at the location described in Article II(2)(a), if the entities agree that the exchange would provide the same effectiveness for control of floods on the Columbia River at the Dalles, Oregon;

(b) operate any additional storage in the Columbia River basin in Canada, when called upon by an entity designated by the United States of America for that purpose, within the limits of existing facilities and as the entity requires to meet flood control needs for the duration of the flood period for which the call is made.

3. For the purpose of flood control after the expiration of sixty years from the ratification date, and for so long as the flows in the Columbia River in Canada continue to contribute to poten-tial flood hazard in the United States of America, Canada shall, when called upon by an entity designated by the United States of America for that purpose, operate within the limits of existing facilities any storage in the Columbia River basin in Canada as the entity requires to meet flood control needs for the duration of the flood control period for which the call is made.

4. The return to Canada for hydroelectric operation and the compensation to Canada for flood control operation shall be as set out in Articles V and VI.

5. Any water resource development, in addition to the Canadian storage, constructed in Canada after the ratification date shall not be operated in a way that adversely affect the stream flow control in the Columbia River within Canada so as to reduce the flood control and hydroelectric power benefits which the operation of the Canadian storage in accordance with the operating plans in force from time to time would otherwise produce.

6. As soon as any Canadian storage becomes operable Canada shall commence operation thereof in accordance with this Article and in any event shall commence full operation of the Canadian storage

described in Article II(2)(b) and Article II(2)(c) within five years of the ratification date and shall commence full operation of the balance of the Canadian storage within nine years of the ratification date.

ARTICLE V
Entitlement to Downstream Power Benefits

1. Canada is entitled to one half the downstream power benefits determined under Article VII.

2. The United States of America shall deliver to Canada at a point on the Canada-United States of America boundary near Oliver, British Columbia, or such other place as the entities may agree upon, the downstream power benefits to which Canada is entitled, less

(a) transmission loss,

(b) the portion of the entitlement disposed of under Article VIII(1), and

(c) the energy component described in Article VIII(4).

3. The entitlement of Canada to downstream power benefits begins for any portion of Canadian storage upon commencement of its operation in accordance with Annex A and pursuant to a hydroelectric operating plan made thereunder.

ARTICLE VI
Payment for Flood Control

1. For the flood control provided by Canada under Article IV(2)(a) the United States of America shall pay Canada in United States funds:

(a) 1,200,000 dollars upon the commencement of operation of the storage referred to in subparagraph (a)(i) thereof,

(b) 52,100,000 dollars upon the commencement of operation of the storage referred to in subparagraph (a)(ii) thereof, and

(c) 11,100,000 dollars upon the commencement of operation of the storage referred to in subparagraph (a)(iii) thereof.

2. If full operation of any storage is not commenced within the time specified in Article IV, the amount set forth in paragraph (1) of this Article with respect to that storage shall be reduced as follows:

(a) under paragraph (1)(a), 4,500 dollars for each month beyond the required time,

(b) under paragraph (1)(b), 192, 100 dollars for each month beyond the required time, and

(c) under paragraph (1)(c), 40,800 dollars for each month beyond the required time.

3. For the flood control provided by Canada under Article IV(2)(b) the United States of America shall pay Canada in United States funds in respect only of each of the first four flood periods for which a call is made 1,875,000 dollars and shall deliver to Canada in respect of each and every call made, electric power equal to the hydroelectric power lost by Canada as a result of operating the storage to meet the flood control need for which the call was made, delivery to be made when the loss of hydroelectric power occurs.

4. For each flood period for which flood control is provided by Canada under Article IV(3), the United States of America shall pay Canada in United States funds:

(a) the operating cost incurred by Canada in providing the flood control, and

(b) compensation for the economic loss to Canada arising directly from Canada foregoing alternative uses of the storage used to provide the flood control.

5. Canada may elect to receive in electric power, the whole or any portion of the compensation under paragraph 4(b) representing loss of hydroelectric power to Canada.

ARTICLE VII

Determination of Downstream Power Benefits

1. The downstream power benefits shall be the difference in the hydroelectric power capable of being generated in the United States of America with and without the use of Canadian storage, determined in advance, and is referred to in the Treaty as the downstream power benefits.

2. For the purpose of determining the downstream power benefits:

(a) the principles and procedures set out in Annex B shall be used and followed;

(b) the Canadian storage shall be considered as next added to 13,000,000 acre-feet of the usable storage listed in Column 4 of the table in Annex B;

(c) the hydroelectric facilities included in the base system shall be considered as being operated to make the most effective use for hydroelectric power generation of the improvement in stream flow resulting from operation of the Canadian storage.

3. The downstream power benefits to which Canada is entitled shall be delivered as follows:

(a) dependable hydroelectric capacity as scheduled by the Canadian entity, and

(b) average annual usable hydroelectric energy in equal amounts each month, or in accordance with a modification agreed upon under paragraph (4).

4. Modification of the obligation in paragraph (3)(b) may be agreed upon by the entities.

ARTICLE VIII

Disposal of Entitlement to Downstream Power Benefits

1. With the authorization of Canada and the United States of America evidenced by exchange of notes, portions of the downstream power benefits to which Canada is entitled may be disposed of within the United States of America. The respective general conditions and limits within which the entities may arrange initial disposals shall be set out in an exchange of notes to be made as soon as possible after the ratification date.

2. The entities may arrange and carry out exchanges of dependable hydroelectric capacity and average annual usable hydroelectric energy to which Canada is entitled for average annual usable hydroelectric energy and dependable hydroelectric capacity respectively.

3. Energy to which Canada is entitled may not be used in the United States of America except in accordance with paragraphs (1) and (2).

4. The bypassing at dams on the main stem of the Columbia River in the United States of America of an amount of water which could produce usable energy equal to the energy component of the downstream power benefits to which Canada is entitled but not delivered to Canada under Article V or disposed of in accordance with paragraphs (1) and (2) at the time the energy component was not so

delivered or disposed of, is conclusive evidence that such energy component was not used in the United States of America and that the entitlement of Canada to such energy component is satisfied.

ARTICLE IX
Variation of Entitlement to Downstream Power Benefits

1. If the United States of America considers with respect to any hydroelectric power project planned on the main stem of the Columbia River between Priest Rapids Dam and McNary Dam that the increase in entitlement of Canada to downstream power benefits resulting from the operation of the project would produce a result which would not justify the United States of America in incurring the costs of construction and operation of the project, Canada and the United States of America at the request of the United States of America shall consider modification of the increase in entitlement.

2. An agreement reached for the purposes of this Article shall be evidenced by an exchange of notes.

ARTICLE X
East-West Standby Transmission

1. The United States of America shall provide in accordance with good engineering practice east-west standby transmission service adequate to safeguard the transmission from Oliver, British Columbia, to Vancouver, British Columbia, of the downstream power benefits to which Canada is entitled and to improve system stability of the east-west circuits in British Columbia.

2. In consideration of the standby transmission service, Canada shall pay the United States of America in Canadian funds the equivalent of 1.50 United States dollars a year for each kilowatt of dependable hydroelectric capacity included in the downstream power benefits to which Canada is entitled.

3. When a mutually satisfactory electric coordination arrangement is entered into between the entities and confirmed by an exchange of notes between Canada and the United States of America the obligation of Canada in paragraph (2) ceases.

ARTICLE XI
Use of Improved Stream Flow

1. Improvement in stream flow in one country brought about by operation of storage constructed under the Treaty in the other country shall not be used directly or indirectly for hydroelectric power purposes except:

(a) in the case of use within the United States of America with the prior approval of the United States entity, and

(b) in the case of use within Canada with the prior approval of the authority in Canada having jurisdiction.

2. The approval required by this Article shall not be given except upon such conditions, consistent with the Treaty, as the entity or authority considers appropriate.

ARTICLE XII
Kootenai River Development

1. The United States of America for a period of five years from the ratification date, has the option to commence construction of a dam on the Kootenai River near Libby, Montana, to provide storage to meet flood control and other purposes in the United States of America. The storage reservoir of the dam shall not raise the level of the Kootenai River at the Canada-United States of America boundary above an elevation consistent with a normal full pool elevation at the dam of 2,459

feet, United States Coast and Geodetic Survey datum, 1929 General Adjustment, 1947 International Supplemental Adjustment.

2. All benefits which occur in either country from the construction and operation of the storage accrue to the country in which the benefits occur.

3. The United States of America shall exercise its option by written notice to Canada and shall submit with the notice a schedule of construction which shall include provision for commencement of construction, whether by way of railroad relocation work or otherwise, within five years of the ratification date.

4. If the United States of America exercises its option, Canada in consideration of the benefits accruing to it under paragraph (2) shall prepare and make available for flooding the land in Canada necessary for the storage reservoir of the dam within a period consistent with the construction schedule.

5. If a variation in the operation of the storage is considered by Canada to be of advantage to it the United States of America shall, upon request, consult with Canada. If the United States of America determines that the variation would not be to its disadvantage it shall vary the operation accordingly.

6. The operation of the storage by the United States of America shall be consistent with any order of approval which may be in force from time to time relating to the levels of Kootenay Lake made by the International Joint Commission under the Boundary Waters Treaty, 1909.

7. Any obligation of Canada under this Article ceases if the United States of America, having exercised the option, does not commence construction of the dam in accordance with the construction schedule.

8. If the United States of America exercises the option it shall commence full operation of the stor-age within seven years of the date fixed in the construction schedule for commencement of construction.

9. If Canada considers that any portion of the land referred to in paragraph (4) is no longer needed for the purpose of this Article Canada and the United States of America, at the request of Canada, shall consider modification of the obligation of Canada in paragraph (4).

10. If the Treaty is terminated before the end of the useful life of the dam Canada shall for the remainder of the useful life of the dam continue to make available for the storage reservoir of the dam any portion of the land made available under paragraph (4) that is not required by Canada for purposes of diversion of the Kootenay River under Article XIII.

ARTICLE XIII
Diversions

1. Except as provided in this Article neither Canada nor the United States of America shall, without the consent of the other evidenced by an exchange of notes, divert for any use, other than consumptive use, any water from its natural channel in a way that alters the flow of any water as it crosses the Canada-United States of America boundary within the Columbia River Basin.

2. Canada has the right, after the expiration of twenty years from the ratification date, to divert not more than 1,500,000 acre-feet of water a year from the Kootenay River in the vicinity of Canal Flats, British Columbia, to the headwaters of the Columbia River, provided that the diversion does not reduce the flow of the Kootenay River immediately downstream from the point of diversion below the lesser of 200 cubic feet per second or the natural flow.

3. Canada has the right, exercisable at any time during the period commencing sixty years after the ratification date and expiring one hundred years after the ratification date, to divert to the headwaters of the Columbia River any water which, in its natural channel, would flow in the Kootenay

River across the Canada-United States of America boundary, provided that the diversion does not reduce the flow of the Kootenay River at the Canada-United States of America boundary near Newgate, British Columbia, below the lesser of 2500 cubic feet per second or the natural flow.

4. During the last twenty years of the period within which Canada may exercise the right to divert described in paragraph (3) the limitation on diversion is the lesser of 1000 cubic feet per second or the natural flow.

5. Canada has the right:

(a) if the United States of America does not exercise the option in Article XII(1), or

(b) if it is determined that the United States of America, having exercised the option, did not commence construction of the dam referred to in Article XII in accordance therewith or that the United States of America is in breach of the obligation in that Article to commence full operation of the storage,

to divert to the headwaters of the Columbia River any water which, in its natural channel, would flow in the Kootenay River across the Canada-United States of America boundary, provided that the diversion does not reduce the flow of the Kootenay River at the Canada-United States of America boundary near Newgate, British Columbia, below the lesser of 1000 cubic feet per second or the natural flow.

6. If a variation in the use of the water diverted under paragraph (2) is considered by the United States of America to be of advantage to it Canada shall, upon request, consult with the United States of America. If Canada determines that the variation would not be to its disadvantage it shall vary the use accordingly.

ARTICLE XIV
Arrangements for Implementation

1. Canada and the United States of America shall each, as soon as possible after the ratification date, designate entities and when so designated the entities are empowered and charged with the duty to formulate and carry out the operating arrangements necessary to implement the Treaty. Either Canada or the United States of America may designate one or more entities. If more than one is designated the powers and duties conferred upon the entities by the Treaty shall be allocated among them in the designation.

2. In addition to the powers and duties dealt with specifically elsewhere in the Treaty the powers and duties of the entities include:

(a) coordination of plans and exchange of information relating to facilities to be used in producing and obtaining the benefits contemplated by the Treaty,

(b) calculation of and arrangements for delivery of hydroelectric power to which Canada is entitled for providing flood control,

(c) calculation of the amounts payable to the United States of America for standby transmission services,

(d) consultation on requests for variations made pursuant to Articles XII(5) and XIII(6),

(e) the establishment and operation of a hydrometeorological system as required by Annex A,

(f) assisting and cooperating with the Permanent Engineering Board in the discharge of its functions,

(g) periodic calculation of accounts,

(h) preparation of the hydroelectric operating plans and the flood control operating plans for the Canadian storage together with determination of the downstream power benefits to which Canada is entitled,

(i) preparation of proposals to implement Article VIII and carrying out any disposal authorized or exchange provided for therein,

(j) making appropriate arrangements for delivery to Canada of the downstream power benefits to which Canada is entitled including such matters as load factors for delivery, times and points of delivery, and calculation of transmission loss,

(k) preparation and implementation of detailed operating plans that may produce results more advantageous to both countries than those that would arise from operation under the plans referred to in Annexes A and B.

3. The entities are authorized to make maintenance curtailments. Except in case of emergency, the entity responsible for a maintenance curtailment shall give notice to the corresponding Canadian or United States entity of the curtailment, including the reason therefor and the probable duration thereof and shall both schedule the curtailment with a view to minimizing its impact and exercise due diligence to resume full operations.

4. Canada and the United States of America may by an exchange of notes empower or charge the entities with any other matter coming within the scope of the Treaty.

ARTICLE XV
Permanent Engineering Board

1. A permanent Engineering Board is established consisting of four members, two to be appointed by Canada and two by the United States of America. The initial appointments shall be made within three months of the ratification date.

2. The Permanent Engineering Board shall:

(a) assemble records of the flows of the Columbia River and the Kootenay River at the Canada-United States of America boundary;

(b) report to Canada and the United States of America whenever there is substantial deviation from the hydroelectric and flood control operating plans and if appropriate include in the report recommendations for remedial action and compensatory adjustments;

(c) assist in reconciling differences concerning technical or operational matters that may arise between the entities;

(d) make periodic inspections and require reports as necessary from the entities with a view to ensuring that the objectives of the Treaty are being met;

(e) make reports to Canada and the United States of America at least once a year of the results being achieved under the Treaty and make special reports concerning any matter which it considers should be brought to their attention;

(f) investigate and report with respect to any other matter coming within the scope of the Treaty at the request of either Canada or the United States of America.

3. Reports of the Permanent Engineering Board made in the course of the performance of its functions under this Article shall be prima facie evidence of the facts therein contained and shall be accepted unless rebutted by other evidence.

4. The Permanent Engineering Board shall comply with directions, relating to its administration and procedures, agreed upon by Canada and the United States of America as evidenced by an exchange of notes.

ARTICLE XVI
Settlement of Differences

1. Differences arising under the Treaty which Canada and the United States of America cannot resolve may be referred by either to the International Joint Commission for decision.

2. If the International Joint Commission does not render a decision within three months of the referral or within such other period as may be agreed upon by Canada and the United States of America, either may then submit the difference to arbitration by written notice to the other.

3. Arbitration shall be a tribunal composed of a member appointed by Canada, a member appointed by the United States of America and a member appointed jointly by Canada and the United States of America who shall be Chairman. If within six weeks of the delivery of a notice under paragraph (2) either Canada or the United States of America has failed to appoint its member, or they are unable to agree upon the member who is to be Chairman, either Canada or the United States of America may request the President of the International Court of Justice to appoint the member or members. The decision of a majority of the members of an arbitration tribunal shall be the decision of the tribunal.

4. Canada and the United States of America shall accept as definitive and binding and shall carry out any decision of the International Joint Commission or an arbitration tribunal.

5. Provision for the administrative support of a tribunal and for remuneration and expenses of its members shall be as agreed in an exchange of notes between Canada and the United States of America.

6. Canada and the United States of America may agree by an exchange of notes on alternative procedures for settling differences arising under the Treaty, including reference of any difference to the International Court of Justice for decision.

ARTICLE XVII
Restoration of Pre-Treaty Legal Status

1. Nothing in this Treaty and no action taken or foregone pursuant to its provisions shall be deemed, after its termination or expiration, to have abrogated or modified any of the rights or obligations of Can-ada or the United States of America under then existing international law, with respect to the uses of the water resources of the Columbia River basin.

2. Upon termination of this Treaty, the Boundary Waters Treaty, 1909, shall, if it has not been terminated, apply to the Columbia River basin, except insofar as the provisions of that Treaty may be inconsistent with any provision of this Treaty which continues in effect.

3. Upon termination of this Treaty, if the Boundary Waters Treaty, 1909, has been terminated in accordance with Article XIV of that Treaty, the provisions of Article II of that Treaty shall continue to apply to the waters of the Columbia River basin.

4. If upon the termination of this Treaty Article II of the Boundary Waters Treaty, 1909, continues in force by virtue of paragraph (2) of this Article the effect of Article II of that Treaty with respect to the Columbia River basin may be terminated by either Canada or the United States of America delivering to the other one year's written notice to that effect; provided however that the notice may be given only after the termination of this Treaty.

5. If, prior to the termination of this Treaty, Canada undertakes works usable for and relating to a diversion of water from the Columbia River basin, other than works authorized by or under-taken

for the purpose of exercising a right under Article XIII or any other provision of this Treaty, paragraph (3) of this Article shall cease to apply one year after delivery by either Canada or the United States of America to the other of written notice to that effect.

ARTICLE XVIII
Liability for Damage

1. Canada and the United States of America shall be liable to the other and shall make appropriate compensation to the other in respect of any act, failure to act, omission or delay amounting to a breach of the Treaty or any of its provisions other that an act, failure to act, omission or delay occurring by reason of war, strike, major calamity, act of God, uncontrollable force or maintenance curtailment.

2. Except as provided in paragraph (1) neither Canada nor the United States of America shall be liable to the other or to any person in respect of any injury, damage or loss occurring in the territory of the other caused by any act, failure to act, omission or delay under the Treaty whether the injury, damage or loss results from negligence or otherwise.

3. Canada and the United States of America, each to the extent possible within its territory, shall exercise due diligence to remove the cause of and to mitigate the effect of any injury, damage or loss occurring in the territory of the other as a result of any act, failure to act, omission or delay under the Treaty.

4. Failure to commence operation as required by Articles IV and XII is not a breach of the Treaty and does not result in the loss of rights under the Treaty if the failure results from a delay that is not wilful or reasonably avoidable.

5. The compensation payable under paragraph (1):

(a) in respect of a breach by Canada of the obligation to commence full operation of a storage, shall be forfeiture of entitlement to downstream power benefits resulting from the operation of that storage, after operation commences, for a period equal to the period between the day of commencement of operation and the day when commencement should have occurred;

(b) in respect of any other breach by either Canada or the United States of America, causing loss of power benefits, shall not exceed the actual loss in revenue from the sale of hydroelectric power.

ARTICLE XIX
Period of Treaty

1. The Treaty shall come into force on the ratification date.

2. Either Canada or the United States of America may terminate the Treaty other than Article XIII (Except paragraph (1) thereof), Article XVII and this Article at any time after the Treaty has been in force for sixty years if it has delivered at least ten years written notice to the other of its intention to terminate the Treaty.

3. If the Treaty is terminated before the end of the useful life of a dam built under Article XII then, notwithstanding termination, Article XII remains in force until the end of the useful life of the dam.

4. If the Treaty is terminated before the end of the useful life of the facilities providing the storage described in Article IV(3) and if the conditions described therein exist then, notwithstanding termination, Articles IV(3) and VI(4) and (5) remain in force until either the end of the useful life of those facilities or until those conditions cease to exist, whichever is the first to occur.

ARTICLE XX
Ratification

The instruments of ratification of the Treaty shall be exchanged by Canada and the United States of America at Ottawa, Canada.

ARTICLE XXI
Registration with the United Nations

In conformity with Article 102 of the Charter of the United Nations, the Treaty shall be registered by Canada with the Secretariat of the United Nations.

This Treaty has been done in duplicate copies in the English language.

IN WITNESS WHEREOF the undersigned, duly authorized by their respective Governments, have signed this Treaty at Washington, District of Columbia, United States of America, this seventeenth day of January, 1961.

For Canada

John G. Diefenbaker
Prime Minister of Canada
E.D. Fulton
Minister of Justice
A.D.P. Heeney
Ambassador Extraordinary and Plenipotentiary of Canada to the United States of America

For the United States of America

Dwight D. Eisenhower
President of the United States of America
Christian A. Herter
Secretary of State
Elmer F. Bennett
Under Secretary of the Interior

ANNEX A
Principles of Operation

General:

1. The Canadian storage provided under Article II will be operated in accordance with the procedures described herein.

2. A hydrometeorological system, including snow courses, precipitation stations and stream flow gauges will be established and operated, as mutually agreed by the entities and in consultation with the Permanent Engineering Board, for use in establishing data for detailed programming of flood control and power operations. Hydrometeorological information will be made available to the entities in both countries for immediate and continuing use in flood control and power operations.

3. Sufficient discharge capacity at each dam to afford the desired regulation for power and flood control will be provided through outlet works and turbine installations as mutually agreed by the entities. The discharge capacity provided for flood control operations will be large enough to pass inflow plus sufficient storage releases during the evacuation period to provide the storage space required. The discharge capacity will be evaluated on the basis of full use of any conduits provide for that purpose plus one half the hydraulic capacity of the turbine installation at the time of commencement of the operation of storage under the Treaty.

4. The outflows will be in accordance with storage reservation diagrams and associated criteria established for flood control purposes and with reservoir-balance relationships established for power operations. Unless otherwise agreed by the entities the average weekly outflows shall not be less than 3000 cubic feet per second at the dam described in Article II(2)(a), not less than 5000 cubic feet per second at the dam described in Article II(2)(b), and not less than 1000 cubic feet per second at the dam described in Article II(2)(c). These minimum average weekly releases may be scheduled by the Canadian entity as required for power or other purposes.

Flood Control:

5. For flood control operation, the United States entity will submit flood control operating plans which may consist of or include flood control storage reservation diagrams and associated criteria for each of the dams. The Canadian entity will operate in accordance with these diagrams or any variation which the entities agree will not derogate from the desired aim of the flood control plan. The use of these diagrams will be based on data obtained in accordance with paragraph 2. The diagrams will consist of relationships specifying the flood control storage reservations required at indicated times of the year for volumes of forecast runoff. After consultation with the Canadian entity the United States entity may from time to time as conditions warrant adjust these storage reservation diagrams within the general limitations of flood control operation. Evacuation of the storages listed hereunder will be guided by the flood control storage reservation diagrams and refill will be as requested by the United States entity after consultation with the Canadian entity. The general limitations of flood control operation are as follows:

(a) The Dam described in Article II(2)(a) - The reservoir will be evacuated to provide up to 80,000 acre-feet of storage, if required, for flood control use by May 1 of each year.

(b) The Dam described in Article II(2)(b) - The reservoir will be evacuated to provide up to 7,100,000 acre-feet of storage, if required, for flood control use by May 1 of each year.

(c) The Dam described in Article II(2)(c) - The reservoir will be evacuated to provide up to 700,000 acre-feet of storage, if required, for flood control use by April 1 of each year and up to 1,270,000 acre-feet of storage, if required, for flood control use by May 1 of each year.

(d) The Canadian entity may exchange flood control storage provided in the reservoir referred to in subparagraph (b) for additional storage provided in the reservoir referred to in sub-

paragraph (a) if the entities agree that the exchange would provide the same effectiveness for control of floods on the Columbia River at The Dalles, Oregon.

Power:

6. For power generating purposes the 15,500,000 acre-feet of Canadian storage will be operated in accordance with operating plans designed to achieve optimum power generation downstream in the United States of America until such time as power generating facilities are installed at the site referred to in paragraph 5(a) or at sites in Canada downstream therefrom.

7. After at-site power is developed at the site referred to in paragraph 5(a) or power generating facilities are placed in operation in Canada downstream from that site, the storage operation will be changed so as to be operated in accordance with operating plans designed to achieve optimum power generation at-site in Canada and downstream in Canada and the United States of America, including consideration of any agreed electrical coordination between the two countries. Any reduction in the downstream power benefits in the United States of America resulting from that change in operation of the Canadian storage shall not exceed in any one year the reduction in downstream power benefits in the United States of America which would result from reducing by 500,000 acre-feet the Canadian storage operated to achieve optimum power generation in the United States of America and shall not exceed at any time during the period of the Treaty the reduction in downstream power benefits in the United States of America which would result from similarly reducing the Canadian storage by 3,000,000 acre-feet.

8. After at-site power is developed at the site referred to in paragraph 5(a) or power generating facilities are placed in operation in Canada downstream from that site, storage may be operated to achieve optimum generation of power in the United States of America alone if mutually agreed by the entities in which event the United States of America shall supply power to Canada to offset any reduction in Canadian generation which would be created as a result of such operation as compared to operation to achieve optimum power generation at-site in Canada and downstream in Canada and the United States of America. Similarly, the storage may be operated to achieve optimum generation of power in Canada alone if mutually agreed by the entities in which event Canada shall supply power to the United States of America to offset any reduction in United States generation which would be created as a result of such operation as compared to operation to achieve optimum power generation at-site in Canada and downstream in Canada and the United States of America.

9. Before the first storage becomes operative, the entities will agree on operating plans and the resulting downstream power benefits for each year until the total of 15,500,000 acre-feet of storage in Canada becomes operative. In addition, commencing five years before the total of 15,500,000 acre-feet of storage is expected to become operative, the entities will agree annually on operating plans and the resulting downstream power benefits for the sixth succeeding year of operation thereafter. This procedure will continue during the life of the Treaty, providing to both the entities, in advance, an assured plan of operation of the Canadian storage and a determination of the resulting downstream power benefits for the next succeeding five years.

ANNEX B
Determination of Downstream Power Benefits

1. The downstream power benefits in the United States of America attributable to operation in accordance with Annex A of the storage provided by Canada under Article II will be determined in advance and will be the estimated increase in dependable hydroelectric capacity in kilowatts for agreed critical stream flow periods and the increase in average annual usable hydroelectric energy output in kilowatt hours on the basis of an agreed period of stream flow record.

2. The dependable hydroelectric capacity to be credited to Canadian storage will be the difference between the average rates of generation in kilowatts during the appropriate critical stream flow periods for the United States of America base system, consisting of the projects listed in the table, with and without the addition of the Canadian storage, divided by the estimated average critical period load factor. The capacity credit shall not exceed the difference between the capability of the base system without Canadian storage and the maximum feasible capability of the base system with Canadian storage, to supply firm load during the critical stream flow periods.

3. The increase in the average annual usable hydroelectric energy will be determined by first computing the difference between the available hydroelectric energy at the United States base system with and without Canadian storage. The entities will then agree upon the part of available energy which is usable with and without Canadian storage, and the difference thus agreed will be the increase in average annual usable hydroelectric energy. Determination of the part of the energy which is usable will include consideration of existing and scheduled transmission facilities and the existence of markets capable of using the energy on a contractual basis similar to the then existing contracts. The part of the available energy which is considered usable shall be the sum of:

(a) the firm energy,

(b) the energy which can be used for thermal power displacement in the Pacific Northwest Area as defined in Paragraph 7, and

(c) the amount of the remaining portion of the available energy which is agreed by the entities to be usable and which shall not exceed in any event 40% of that remainder.

4. An initial determination of the estimated downstream power benefits in the United States of America from Canadian storage added to the United States base system will be made before any of the Canadian storage becomes operative. This determination will include estimates of the downstream power benefits for each year until the total of 15,500,000 acre-feet of Canadian storage becomes operative.

5. Commencing five years before the total of 15,500,000 acre-feet of storage is expected to become operative, estimates of downstream power benefits will be calculated annually for the sixth succeeding year on the basis of the assured plan of operation for that year.

6. The critical stream flow period and the details of the assured plan of operation will be agreed upon by the entities at each determination. Unless otherwise agreed upon by the entities, the determination of the downstream power benefits shall be based upon stream flows for the twenty year period beginning with July 1928 as contained in the report entitled Modified Flows at Selected Power Sites - Columbia River Basin, dated June 1957. No retroactive adjustment in downstream power benefits will be made at any time during the period of the Treaty. No reduction in the downstream power benefits credited to Canadian storage will be made as a result of the load estimate in the United States of America, for the year for which the determination is made, being less than the load estimate for the preceding year.

7. In computing the increase in dependable hydroelectric capacity and the increase in average annual hydroelectric energy, the procedure shall be in accordance with the three steps described below and shall encompass the loads of the Pacific Northwest Area. The Pacific Northwest Area

for purposes of these determinations shall be Oregon, Washington, Idaho, and Montana west of the Continental Divide but shall exclude areas served on the ratification date by the California Oregon Power Company and the Utah Power and Light Company.

Step I - The system for the period covered by the estimate will consist of the Canadian storage, the United States base system, any thermal installation operated in coordination with the base system, and ad-ditional hydroelectric projects which will provide storage releases usable by the base system or which will use storage releases that are usable by the base system. The installations included in this system will be those required, with allowance for adequate reserves, to meet the forecast power load to be served by this system in the United States of America, including the estimated flow of power at points of inter-connection with adjacent areas, subject to paragraph 3, plus the portion of the entitlement of Canada that is expected to be used in Canada. The capability of this system to supply this load will be determined on the basis that the system will be operated in accordance with the established operating procedures of each of the projects involved.

Step II - A determination of the energy capability will be made using the same thermal installation as in Step I, the United States base system with the same installed capacity as in Step I and Canadian storage.

Step III - A similar determination of the energy capability will be made using the same thermal installation as in Step I and the United States base system with the same installed capacity as in Step I.

8. The downstream power benefits to be credited to Canadian storage will be the differences between the determinations in Step II and Step III in dependable hydroelectric capacity and in average annual usable hydroelectric energy, made in accordance with paragraphs 2 and 3.

ANNEX B - TABLE - BASE SYSTEM

Project	Stream	Stream Mile Above Mouth	Usable Storage Acre-Feet	Normal Pool Feet	Elev. Tailwater Feet	Gross Head Feet	Initial Install. # of Units	Initial Install. Plant Kilowatts (Nameplate)	Estimated Ultimate Install. # of Units	Estimated Ultimate Install. Plant Kilowatts (Nameplate)
Hungry Horse	SFk Flathead	5	3,161,000(4)	3560	3083	477	4	285,000	4	285,000
Kerr	Flathead	73	1,219,000	2893	2706	187	3	168,000	3	168,000
Thompson Falls	Clark Fork	279	Pondage	2396	2336	60	6	30,000	8	65,000
Noxon Rapids	Clark Fork	170	Pondage	2331	2179	152	4	336,000	5	420,000
Cabinet Gorge	Clark Fork	150	Pondage	2175	2078	97	4	200,000	6	300,000
Albeni Falls	Pend Oreille	90	1,155,000	2062	2034	28	3	42,600	3	42,600
Box Canyon	Pend Oreille	34	Pondage	2031	1989	42	4	60,000	4	60,000
Grand Coulee	Columbia	597	5,232,000(4)	1290(3,4)	947	343	18	1,944,000	34	3,672,000
Chief Joseph	Columbia	546	Pondage	946	775	171	16	1,024,000	27	1,728,000
Wells (1)	Columbia	516	Pondage	775	707	68	6	400,000	10	666,700
Rocky Reach	Columbia	474	Pondage	707	614	93	7	711,550	11	1,118,150
Rock Island	Columbia	453	Pondage	608	570	38	10	212,100	10	212,100
Wanapum	Columbia	415	Pondage	570	486	84	10	831,250	16	1,330,000
Priest Rapids	Columbia	397	Pondage	486	406	80	10	788,500	16	1,261,600
Brownlee	Snake	285	974,000	2077	1805	272	4	360,400	6	540,600
Oxbow	Snake	273	Pondage	1805	1683	122	4	190,000	5	237,500
Ice Harbor	Snake	10	Pondage	440	343	97	3	270,000	6	540,000
McNary	Columbia	292	Pondage	340	265	75	14	980,000	20	1,400,000
John Day	Columbia	216	Pondage	265	161	104	8	1,080,000	20	2,700,000
The Dalles	Columbia	192	Pondage	160	74	86	16(2)	1,119,000	24(2)	1,743,000
Bonneville	Columbia	145	Pondage	74	15	59	10	518,400	16	890,400
Kootenay Lk	Kootenay	16	673,000	1745	--	--	--	--	--	--
Chelan	Chelan	0	676,000	1100	707	393	2	48,000	4	96,600
Couer d'Alene L.	Couer d'Alene	102	223,000	2128	--	--	--	--	--	--
TOTAL 24 PROJECTS			13,313,000(4)			3128		11,598,800	258	19,476,600

(1) The Wells project is not presently under construction; when this project or any other project on the main stem of the Columbia River is completed, they will be integral components of the base system.

(2) Includes two 13,500 kilowatt units for fish attraction water.

(3) With flashboards.

(4) In determining the base system capabilities with and without Canadian storage the Hungry Horse reservoir storage will be limited to 3,008,000 acre-feet (normal full pool elevation of 3560 feet) and the Grand Coulee project will not include the effect of adding flashboards, limiting the storage to 5,072 acre-feet (normal full pool elevation of 1288 feet). The total usable storage of the base system as so adjusted will be 13,000,000 acre-feet.

Protocol

ANNEX TO EXCHANGE OF NOTES

Dated January 22, 1964 Between the Governments of Canada And The United States Regarding the Columbia River Treaty

I. If the United States entity should call upon Canada to operate storage in the Columbia River Basin to meet flood control needs of the United States of America pursuant to Article IV(2)(b) or Article IV(3) of the Treaty, such call shall be made only to the extent necessary to meet forecast flood control needs in the territory of the United States of America that cannot adequately be met by flood control facilities in the United States of America in accordance with the following conditions:

(1) Unless otherwise agreed by the Permanent Engineering Board, the need to use Canadian flood control facilities under Article IV(2)(b) of the Treaty shall be considered to have arisen only in the case of potential floods which could result in a peak discharge in excess of 600,000 cubic feet per second at The Dalles, Oregon, assuming the use of all related storage in the United States of America existing and under construction in January 1961, storage provided by any dam constructed pursuant to Article XII of the Treaty and the Canadian storage described in Article IV(2)(a) of the Treaty.

(2) The United States entity will call upon Canada to operate storage under Article IV(3) of the Treaty only to control potential floods in the United States of America that could not be adequately controlled by all the related storage facilities in the United States of America existing at the expiration of 60 years from the ratification date but in no event shall Canada be required to provide any greater degree of flood control under Article IV(3) of the Treaty than that provided for under Article IV(2) of the Treaty.

(3) A call shall be made only if the Canadian entity has been consulted whether the need for flood control is, or is likely to be, such that it cannot be met by the use of flood control facilities in the United States of America in accordance with subparagraphs (1) or (2) of this paragraph. Within ten days of receipt of a call, the Canadian entity will communicate its acceptance, or its rejection or proposals for modification of the call, together with supporting considerations. When the communication indicates rejection or modification of the call the United States entity will review the situation in the light of the communication and subsequent developments and will then withdraw or modify the call if practicable. In the absence of agreement on the call or its terms the United States entity will submit the matter to the Permanent Engineering Board provided for under Article XV of the Treaty for assistance as contemplated in Article XV(2)(c) of the Treaty. The entities will be guided by any instructions issued by the Permanent Engineering Board. If the Permanent Engineering Board does not issue instructions within ten days of receipt of a submission the United States entity may renew the call for any part or all of the storage covered in the original call and the Canadian entity shall forthwith honor the request.

II. In preparing the flood control operating plans in accordance with paragraph 5 of Annex A of the Treaty, and in making calls to operate for flood control pursuant to Articles IV(2)(b) and IV(3) of the Treaty, every effort will be made to minimize flood damage in both Canada and the United States of America.

III. The exchange of Notes provided for in Article VIII(1) of the Treaty shall take place contemporaneously with the exchange of the Instruments of Ratification of the Treaty provided for in Article XX of the Treaty.

IV. (1) During the period and to the extent that the sale of Canada's entitlement to downstream power benefits within the United States of America as a result of an exchange of Notes pursuant to Article VIII(1) of the Treaty relieves the United States of America of its obligation to provide east-west standby transmission service as called for by Article X(1) of the Treaty, Canada is not required to make payment for the east-west standby transmission service with

regard to Canada's entitlement to downstream power benefits sold in the United States of America.

(2) The United States of America is not entitled to any payments of the character set out in subparagraph (1) of this paragraph in respect of that portion of Canada's entitlement to downstream power benefits delivered by the United States of America to Canada at any point on the Canada-United States of America boundary other than at a point near Oliver, British Columbia, and the United States of America is not required to provide the east-west standby transmission service referred to in subparagraph (1) of this paragraph in respect of the portion of Canada's entitlement to downstream power benefits which is so delivered.

V. Inasmuch as control of historic streamflows of the Kootenay River by the dam provided for in Article XII(1) of the Treaty would result in more than 200,000 kilowatt years per annum of energy benefit downstream in Canada, as well as important flood control protection to Canada, and the operation of that dam is therefore of concern to Canada, the entities shall, pursuant to Article XIV(2)(a) of the Treaty, cooperate on a continuing basis to coordinate the operation of that dam with the operation of hydroelectric plants on the Kootenay River and elsewhere in Canada in accordance with the provisions of Article XII(5) and Article XII(6) of the Treaty.

VI. (1) Canada and the United States of America are in agreement that Article XIII(1) of the Treaty provides to each of them a right to divert water for a consumptive use.

(2) Any diversion of water from the Kootenay River when once instituted under the provisions of Article XIII of the Treaty is not subject to any limitation as to time.

VII. As contemplated by Article IV(1) of the Treaty, Canada shall operate the Canadian storage in accordance with Annex A and hydroelectric operating plans made thereunder. Also, as contemplated by Annexes A and B of the Treaty and Article XIV(2)(k) of the Treaty, these operating plans before they are agreed to by the entities will be conditioned as follows:

(1) As the downstream power benefits credited to Canadian storage decrease with time, the storage required to be operated by Canada pursuant to paragraphs 6 and 9 of Annex A of the Treaty, will be that required to produce those benefits.

(2) The hydroelectric operating plans, which will be based on Step I of the studies referred to in paragraph 7 of Annex B of the Treaty, will provide a reservoir-balance relationship for each month of the whole of the Canadian storage committed rather than a separate relationship for each of the three Canadian storages. Subject to compliance with any detailed operating plan agreed to by the entities as permitted by Article XIV(2)(k) of the Treaty, the manner of operation which will achieve the specific storage or release of storage called for in a hydroelectric operating plan consistent with optimum storage use will be at the discretion of the Canadian entity.

(3) Optimum power generation at-site in Canada and downstream in Canada and the United States of America referred to in paragraph 7 of Annex A of the Treaty will include power generation at-site and downstream in Canada of the Canadian storages referred to in Article II(2) of the Treaty, power generation in Canada which is coordinated therewith, downstream power benefits from the Canadian storage which are produced in the United States of America and measured under the terms of Annex B of the Treaty, power generation in the Pacific Northwest Area of the United States of America and power generation coordinated therewith.

VIII. The determination of downstream power benefits pursuant to Annex B of the Treaty, in respect of each year until the expiration of thirty years from the commencement of full operation in accordance with Article IV of the Treaty of that portion of the Canadian storage described in Article II of the Treaty which is last placed in full operation, and thereafter until otherwise agreed upon by the entities, shall be based upon stream flows for the thirty-year period beginning July 1928 as contained in

the report “Extension of Modified Flows Through 1958 - Columbia River Basin” and dated June 29, 1961, by the Water Management Subcommittee of the Columbia Basin Inter-Agency Committee.

IX. (1) Each load used in making the determinations required by Steps II and III of paragraph 7 of Annex B of the Treaty shall have the same shape as the load of the Pacific Northwest area as that area is defined in that paragraph.

(2) The capacity credit of Canadian storage shall not exceed the difference between the firm load carrying capabilities of the projects and installations included in Step II of paragraph 7 of Annex B of the Treaty and the projects and installations included in Step III of paragraph 7 of Annex B of the Treaty.

X. In making all determinations required by Annex B of the Treaty the loads used shall include the power required for pumping water for consumptive use into the Banks Equalizing Reservoir of the Columbia Basin Federal Reclamation Project but mention of this particular load is not intended in any way to exclude from those loads any use of power that would normally be part of such loads.

XI. In the event operation of any of the Canadian storages is commenced at a time which would result in the United States of America receiving flood protection for periods longer than those on which the amounts of flood control payments to Canada set forth in Article VI(1) of the Treaty are based, the United States of America and Canada shall consult as to the adjustments, if any, in the flood control payments that may be equitable in the light of all relevant factors. Any adjustment would be calculated over the longer period or periods on the same basis and in the same manner as the calculation of the amounts set forth in Article VI(1) of the Treaty. The consultations shall begin promptly upon the determination of definite dates for the commencement of operation of the Canadian storages.

XII. Canada and the United States of America are in agreement that the Treaty does not establish any general principle or precedent applicable to waters other than those of the Columbia River Basin and does not detract from the application of the Boundary Waters Treaty, 1909, to other waters.

Columbia River Treaty 2014/2024 Review Program
Columbia River Watershed Dams

BRITISH COLUMBIA
ALBERTA
CANADA
UNITED STATES OF AMERICA
WASHINGTON
MONTANA
OREGON
IDAHO
WYOMING
NEVADA
UTAH

Upper Columbia River
Middle Columbia River
Kootenai-Pend Oreille-Spokane Rivers
Lower Columbia River
Mainstem Columbia River
Willamette River
Lower Snake River
Upper Snake River

Mica
Revelstoke
Duncan
Corra Linn & Kootenay Canal Projects
Lower Bonnington
Upper Bonnington
Slocan
Brilliant
Arrow Lakes/ Hugh Keenleyside
Seven Mile
Waneta
Boundary
Box Canyon
Bonners Ferry
Priest Lake
Albeni Falls
Cabinet Gorge
Libby
Hungry Horse
Columbia Falls
Flathead Lake
Kerr
Noxon Rapids
Thompson Falls
Post Falls
Coeur d'Alene Lake
Lake Pend Oreille
Long Lake
Nine Mile
Spokane
Upper Falls
Monroe Street
Little Falls
Grand Coulee
Wells
Chief Joseph
Chelan
Lake Chelan
Banks Lake
Rocky Reach
Rock Island
Wenatchee
Keechelus
Kachess
Cle Elum
Bumping Lake
Tieton
Yakima
Priest Rapids
Wanapum
Lower Monumental
Little Goose
Lower Granite
Dworshak
Lewiston
Missoula
Pasco
Richland
Kennewick
Ice Harbor
Mcnary
Vancouver
Portland
Hillsboro
Gresham
Beaverton
Bonneville
The Dalles
John Day
Pelton Rereg
Pelton
Round Butte
Bend
Eugene
Springfield
Salem
Willamette
Hells Canyon
Oxbow
Brownlee
Cascade
Deadwood
Owyhee
Boise
Nampa
Arrowrock
Lucky Peak
Anderson Ranch
American Falls
Pocatello
Idaho Falls
Palisades
Jackson Lake

Columbia River
Kootenay River
Duncan River
Priest River
Pend Oreille River
Spokane River
Sanpoil River
Methow River
Chelan River
Naches River
Yakima River
Cowlitz River
Lewis River
Clackamas River
Willamette River
North Santiam River
South Santiam River
McKenzie River
Deschutes River
Grande Ronde River
Snake River
Clearwater River
North Fork Clearwater River
Clark Fork
Malheur River
Owyhee River
Boise River
Little Wood River
Henry's Fork
Thompson River
Flathead River
North Fork Flathead River
South Fork Flathead River
Hungry Horse Reservoir

Columbia River Treaty 2014/2024 Review Program Columbia River Watershed Dams

- City
- Modeled Dam
- State/Province
- Stream Centerline
- CRT Region

N

0 50 100 200

Miles

BONNEVILLE POWER ADMINISTRATION

US Army Corps of Engineers®

Map Created: 22 JUN 11

Columbia River Treaty 2014-2024 Review
Sovereign Review Team

Sovereign Participation Process

Approved by the SRT: July 14, 2011

Introduction

The purpose of this process is to provide a means for the U.S. Entity to consult with regional sovereigns and stakeholders regarding the future of the Columbia River Treaty. The Columbia River Treaty (CRT) 2014/2024 Review Sovereign Participation Process establishes a framework for sovereign parties to collaborate and coordinate with the U.S. Entity in the process of conducting technical studies, and developing and evaluating alternatives needed to better understand potential Treaty futures.

The Sovereign Participation Process recognizes that, while the U.S. Entity intends to conduct the CRT 2014/2024 Review in a transparent and open manner, the information and recommendations developed through that process may ultimately be used in a negotiated international treaty setting necessitating some constraints on when and how information is shared with participants.

Sovereign Participation Process Principles

The Sovereign Participation Process accomplishes the following principles for the CRT 2014/2024 Review:

- Uses an open and transparent process among the Sovereign Review Team members.
- Uses sound information, best available science and sovereign and stakeholder input to make intelligent recommendations and decisions.
- Uses an efficient consensus-driven decision making process with the basin sovereign parties.
- The U.S. Entity retains authority to make a recommendation to the U.S. Department of State. In the event of non-consensus, each sovereign party may exercise their own authorities to make recommendations of their own.
- Develops and meets efficient and realistic timelines.
- Develops a recommendation and supporting studies that reflect the missions of the United States, including its trust obligations to the tribes, while recognizing the interests of the basin sovereigns and stakeholders.
- Develops an informed and balanced recommendation for the U.S. Department of State as to whether or not it is in the best interest of the U.S. to continue the Treaty, terminate the Treaty, or seek to negotiate with Canada on amendment of the Treaty.

CRT 2014/2024 Review Purpose, Objectives and Success Criteria

The purpose of the Columbia River Treaty (Treaty) 2014/2024 Review is to enable the United States Entity and the regional sovereigns to make an informed recommendation to the U.S. Department of State as to whether or not it is in the best interest of the U.S. to continue the Treaty, terminate the Treaty, or seek to negotiate with Canada on amendment of the Treaty.

Through the CRT 2014/2024 Review, the U.S. Entity will seek to accomplish the following objectives:

- Engage regional stakeholders to understand and consider their interests and to provide information about the Treaty and future options for the Treaty.
- Evaluate the benefits and costs associated with Treaty alternatives on power, flood control, and ecosystem functions.
- Consider other contemporary issues including climate change and other relevant information in assessing the effects of alternatives on other uses, such as fisheries, wildlife, water quality, water supply, irrigation, navigation, cultural resources, and recreation.
- Coordinate, as appropriate, with the Canadian Entity on critical technical, policy and outreach matters associated with the future of the Treaty.
- Recommend a course of action to the U.S. State Department that incorporates areas of consensus with sovereigns and considers the interests of stakeholders consistent with the purpose and the results of the CRT 2014/2024 Review.

Success criteria for the CRT 2014/2024 Review include:

- Accomplishment of the CRT 2014/2024 Treaty Review Purpose and Objectives identified above.
- To recommend a course of action to the State Department in 2013 so that a viable Treaty strategy can be developed that has the support of basin sovereigns and stakeholders.
- Define an integrated operation that:
  - Clearly defines Called Upon flood control operations that Canada agrees to in principle.
  - Appropriately sizes the Canadian entitlement with consideration to downstream benefits.
  - Appropriately allocates the costs and benefits.
  - Clearly defines an environmentally sustainable operation which includes ecosystem function.
- Review studies provide the needed information inform Treaty discussions and they are able to withstand technical, policy and legal scrutiny.

Sovereign Participation Process Framework

The Sovereign Participation Process framework consists of the following components:

Government to Government and Federal Coordination

Who:	U.S. Entity, Tribal Leaders, State Executives and Federal Agency Executives
What:	Government to Government, one-on-one coordination, status of the Treaty Review Studies, and if needed, issue resolution. At this level, the U.S. Entity will seek to achieve a consensus based decision with the other sovereigns on the alternative(s) recommended to the U.S. State Department for river management options and alternatives.
When:	When deemed necessary and/or appropriate
Where:	TBD

Sovereign Review Team (SRT)

Who:	U.S. Entity Coordinators (Co-Chairs), SRT Staff Designees and their Alternates representing: • Regional states (Oregon, Washington, Idaho, and Montana) • 15 NW Tribes (5 representatives – USRT, UCUT, CRITFC, Cowlitz, and CSKT) • Regional Federal Agencies (NMFS, USFWS, BOR, USACE, BPA, BLM, EPA, USFS, USGS, BIA, NPS) All participants on the SRT must be sovereigns, employees of sovereigns, or contractors with sovereigns.
What:	Define and oversee the assignments given to the Sovereign Technical Team and the supporting U.S. Entity Treaty Review Study Team for both policy and technical matters. Staff level discussions and guidance to the technical team concerning study scoping, alternatives, evaluation tools and methodologies, alternative evaluation methodologies, and refinement of preliminary recommendations. Seek to resolve policy disputes that arise at the technical team level.
When:	Monthly and at critical milestones during the Treaty Review process.
Where:	Rotate the location - Portland/Spokane/Boise/Missoula.

Sovereign Technical Team (STT)

Who:	U.S. Entity PMs (Co-Chairs), technical staff designated by their respective sovereign or SRT designee. All participants on the STT must be sovereigns, employees of sovereigns, or contractors with sovereigns.
What:	Based on direction from the Sovereign Review Team, the Sovereign Technical Team will be responsible for the development of the study scope, alternatives, evaluation tools and methodologies, alternative evaluation methodologies, alternative impact assessments, documentation of results, and preliminary recommendations. All participants on the STT must be sovereigns, employees of sovereigns, or contractors with sovereigns.
When:	Every 30-60 days or more frequently based on technical study needs.
Where:	Portland or TBD.

Regional Stakeholders

Who:	Regional Stakeholders
What:	Provide venues for stakeholders to provide concerns, suggestions, information, and expertise to inform the SRT and Review process.
When:	Meetings with subject-area experts will be scheduled directly with the Sovereign Review and Technical Teams at critical milestones or key decision points. Open workshops for broader stakeholder participation will also be scheduled at critical milestones and key decision points. For all meetings involving the SRT and subject –area experts or regional stakeholders, the invitation and meeting summary will be posted publicly.
Where:	Various locations around the region on a rotating basis: Portland/Spokane/ Boise/Missoula.

Tenets of Participation

It will be critical for all participating sovereigns to follow the agreed to engagement processes including consistent meeting attendance and timely participation in providing input during the Treaty Review

study process. As participants, sovereigns are responsible for providing sufficient and appropriate staff with the needed expertise and authority to proceed with the timely input to the Treaty Review studies.

Participation in this process does not in any way waive, alter, diminish or enhance any right or statutory authority of a sovereign, nor does participation imply endorsement of the CRT 2014/2024 Review products or recommendations.

Meeting Management

The U.S. Entity will designate a Meeting Coordinator for the sovereign participation process. It is the responsibility of the Meeting Coordinator to:

- Provide at least 20 working days notice of all Sovereign Review and Technical team meetings;
- Manage and distribute meeting agendas, background materials and technical data at least 5 working days prior to all scheduled meetings;
- Manage and distribute meeting summaries to each Sovereign Review or technical team member. The meeting summaries will document and conspicuously mark substantive decisions and assignments. Each sovereign will have an opportunity to comment on the accuracy of meeting summaries, within 10 working days of receipt; and
- For the purposes of meeting management and document sharing, manage a web-based, password protected site.

Process Documentation

The U.S. Entity will be responsible for completely and accurately documenting key decisions that are made during the process. Analyses and deliberations will be coherent and decisions reached will be accompanied by rationale and explanation of the supporting evidence.

The U.S. Entity will be responsible for establishing and maintaining a web-based information repository that shall be the primary means of disseminating information to Sovereign Review and Technical team members. All documents necessary to implement the sovereign participation process shall be located on this system and available to all sovereign members. E-mail or other appropriate means shall be used to notify agency representatives when new information is added to the system.

Issue Resolution

The purpose of this issue resolution process is to provide a means to resolve disagreements between Sovereign Review Team members. The intention is to expeditiously resolve issues through collaboration and consensus. The issue resolution process involves first an informed discussion among Sovereign Review Team members. Alternative issue resolution forums (e.g., facilitation or mediation) can be used in this process.

Triggers

The issue resolution process may be initiated by any Sovereign Review Team member when there is a disagreement on a policy or technical issue that cannot be resolved by a consensus of Sovereign Review Team members.

Process

Consistent with the BiOp Remand Collaboration Policy Working Group approach, the process will include the preparation of an "Issue Fact Sheet" that will include a consensus-based description of the issue(s), positions of the disputing Sovereign Review Team members, and identify the change that is needed for issue resolution.

Ultimately, if resolution is not reached, the U.S. Entity may choose to either engage a mediator or resolve the issues and proceed ahead. Resolutions or decisions will be documented in a final "Issue Fact Sheet" that will be distributed to all Sovereign Review Team members.

Products from the Sovereign Participation Process

The Sovereign Review Team began meeting in Fall 2010; between its initial meeting and June 2011, the SRT created a number of products that will serve as the foundation for all of the analytical and other work undertaken through the Treaty Review process. Those products are included here.

1) Framework Questions

While there are numerous questions to be addressed through the evaluation of alternatives, it is also important to keep the bigger picture in mind through broader framework questions that serve to articulate the purpose of the collaborative analysis underway. The questions that provide this framework are:

1) What justification will the SRT need to develop in order to support a regional recommendation to the U.S. Entity as to whether it is in the best interest of the U.S. to continue the Treaty, terminate the Treaty, or strive to modify the Treaty?

2) As we look at the options in front of us – 1) Continue under the framework of the Treaty with Called-Upon flood control, coordinated operations, and Canadian Entitlement or 2) Terminate the Treaty with Called-Upon flood control, but no coordinated operations and no Canadian Entitlement:

    - How much is the cost of continuing under the Treaty, compared to the benefits provided to the U.S. in terms of ecological function, flood risk management and power production?
    - Is this significantly better in terms of ecological function, flood risk management and power production than the U.S. would get compared to termination?
    - Are either of these operating scenarios, and the costs associated with each scenario, acceptable from the perspective of ecological function, flood risk management, and power production?

3) As an alternative, the region may recommend modification or amendment to the Treaty. If that is the case:

    - What would the U.S. objectives be with this modification or amendment?
    - What justification would we need for this recommendation?

2) Treaty Review Prologue

The initial work developed to support the recommendation to DOS in 2013 will provide a foundation for additional work leading up to 2024. This initial work will include a full analysis of flood risk management alternatives, including consideration of Called-Upon operations at Canadian reservoirs, effective use of U.S. reservoirs, and modification of levees and other flood management measures. During the Treaty Review process, the Sovereign Technical Team will identify possible additional studies that may be needed to further evaluate and implement alternatives between 2013 and 2024.

As part of the development of the recommendations, the U.S. Entity and Regional Sovereigns will need to discuss how to best continue a regional participation process for post-2013 up to 2024 to address areas such as additional work and studies, implementation of Called Upon and flood risk management actions, and other workload that may result from the recommendations of DOS or a DOS/Presidential decision.

3) Sovereign Sideboards for Study Alternatives and Impact Assessments

1. The design of alternatives, evaluation criteria, and impact assessments are to support the September 2013 recommendation to the Department of State (DOS) as to whether it is in the best interest of the United State to continue, terminate, or seek to amend the Columbia River Treaty with Canada.
2. The focus of the Treaty Review is on operation of U.S. and Canadian Treaty reservoirs, potentially affected U.S. reservoirs within the Columbia River and its tributaries, the resulting flows, characterization of flood risk management requirements and the U.S.'s ability to meet those requirement, and evaluation of effects on the operating objectives and other existing uses.
3. The Treaty Review will design and assess alternatives around three primary driving purposes: Flood Risk Management, Hydropower, and Ecosystem-based Function.
4. Impacts for other system uses (e.g. irrigation, navigation, Columbia River Water Management Program, and recreation) will be assessed qualitatively at a minimum, quantitatively where information and tools are available to support the analysis.
5. Ecosystem function alternatives and impact assessments will be defined by water flow and timing, reservoir levels, water quality, contaminant fate and transport, survival and recovery of important fish and wildlife populations and the long-term sustainability of functions and processes related to riparian, floodplain, and estuary habitat, including cultural resources.
6. The Treaty Review will use tools, such as existing models or models under development that can be agreed upon by the STT and available for use within the limited timeframe of this Review.
7. Treaty Review alternatives will attempt to be inclusive of each Sovereign's interests, but limited to a reasonable number that can be modeled and evaluated within the Treaty Review timeframe.
8. Environmental evaluation and documentation sufficient for the DOS Circular 175 process will support the overall recommendation.
9. Current regulatory and statutory requirements will be the default, but will not necessarily constrain the development of alternatives. Alternatives will clearly identify current regulatory and statutory limitations that would present obstacles to implementation of the alternative.
10. Climate change will be integrated in the alternatives evaluation.

4) Study Purpose and Objectives

Treaty Review Purpose. The purpose of the Columbia River Treaty (Treaty) 2014/2024 Review is to enable the United States Entity and the regional sovereigns to make an informed recommendation to the U.S. Department of State by September 2013 as to whether or not it is in the best interest of the U.S. to continue the Treaty, terminate the Treaty, or seek to negotiate with Canada on amendment of the Treaty[1].

Treaty Review Objective Statements. The following objective statements describe what an alternative may achieve within the context of the Treaty Review sideboards. The objective statements must be measurable. All objectives address a post-2024 condition.

The objectives are sorted into two categories, Primary Operational Driving Purposes and Impact Assessment. The Primary Operational Driving Purposes will be the key drivers in the development of alternatives and subsequent hydro-regulation modeling. Results from the hydro-regulation modeling

(e.g. streamflows and reservoir regulations) will be used to assess the effects of each alternative by evaluating an alternative's ability to meet or advance the achievement of each objective.

The distinction between the Primary Operational Driving Purposes and the Impact Assessment objectives does not reflect relative importance or priority of either group, but simply the distinction between an operational driver and an impact assessment area.

Primary Operational Driving Purposes Objectives

Ecosystem-Based Function

- Provide streamflows with appropriate timing, quantity and water quality in the basin to promote productive populations of native fish and wildlife.
- Provide reservoir conditions to promote productive[2] populations of fish and wildlife.
- Provide for streamflow and reservoir conditions that protect and enhance cultural resources[3].
- Improve hydrology in the estuary to promote productive populations of native fish and wildlife.

Hydropower

- Provide an adequate, efficient, economical, and reliable power supply.
- Provide a flexible power system for integrating renewable resources.
- Ensure that the Canadian Entitlement accurately reflects the power value[4] of the Treaty to the United States relative to termination.

Flood Risk

- Provide an acceptable level of flood risk.

Impact Assessment Objectives

Navigation

- Assess the impacts on the ability to provide an authorized navigation channel and safe lockage.
- Assess the impacts on the ability to provide reservoir conditions to allow for ferry operation[5].

Water Supply

- Assess the impacts on the ability to provide current water supply[6] reliability.
- Assess the opportunities for additional water supply[7] from Canada for instream and out-of-stream uses for the Columbia River Basin[8].
- Assess the impacts of effective use on instream and out-of-stream uses for the Columbia River Basin[9].

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[2] **Productive** is defined as sustainable, healthy populations of fish and wildlife that provide treaty and trust harvest and other legal requirements.
[3] **Cultural Resources** includes culturally significant fish and wildlife.
[4] **Power value** is the difference between the actual U.S. power benefits with the Treaty and use of Canadian storage (i.e. after BiOp operations and with the current system) compared to the actual U.S. power benefits without the Treaty.
[5] **Ferries** addressed by this objective are Keller Ferry and Gifford Ferry, which cross Lake Roosevelt.
[6] **Water supply** refers to all types of water supply within the Columbia River basin, including but not limited to irrigation, municipal and industrial and hatchery operations.
[7] **Additional Water Supply** refers to the timing of releases to meet water supply needs in the U.S.
[8] This would include opportunities such as those presented in plans such as the Columbia River Basin Management Plan, Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of Salmon) Restoration Plan, and other plans as appropriate.

Recreation

- Assess the impacts on the ability to provide conditions to protect infrastructure related to reservoir and river recreation.
- Assess the impacts on the ability to provide reservoir and river conditions for safe and enjoyable recreational activities.

Climate Change

- Assess the opportunities to provide for operational flexibility and resiliency that allows the system to mitigate[10] for and adapt[11] to climate change.

Environmental Issues or Concerns

- Assess the impacts on the ability to minimize contaminated sediments.

[9] This would include opportunities such as those presented in plans such as the Columbia River Basin Management Plan, Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of Salmon) Restoration Plan, and other plans as appropriate.

[10] **Mitigate**- Technological change and substitution that reduces resource inputs and global greenhouse emissions outputs (examples would be implementing actions to reduce these outputs including non-carbon creating energies and energy conservation and associated new technologies). *Definition refers to that found by the International Panel of Climate Change's 2007 AR4 Synthesis Report annex glossary and the Independent Scientific Advisory Board's Report on Climate Change (2007).*

[11] **Adapt**- initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types exist including anticipatory and reactive, private and public and autonomous and planned. Examples include raising coastal dikes, removal of main stem river and estuarine dikes to reduce temperatures and operating/installing selective withdrawal systems at dams to provide cool water to downstream habitats. *Definition refers to that found by the International Panel of Climate Change's 2007 AR4 Synthesis Report annex glossary and the Independent Scientific Advisory Board's Report on Climate Change (2007).*