MEETING SUMMARY

Columbia Basin Regional Advisory Committee Webinar

BC Hydro Dry Year Operations

September 29, 2021, 12pm – 1:30pm Pacific Time via Zoom

The Columbia Basin Regional Advisory Committee (CBRAC) met on September 29, 2021 by Zoom to learn about BC Hydro's operations in the Columbia Basin during dry years. The following summary is based on notes taken during the meeting, and though it is not verbatim, it is meant to reflect the key points of the discussion.

Welcome/CBRAC updates

Brooke McMurchy, B.C. Columbia River Treaty Team

- Brooke welcomed CBRAC members, guests from the Columbia River Treaty Local Governments Committee and Wildsight Columbia River Field School, and presenter Jeremy Benson from BC Hydro.
- She acknowledged the territories of the Ktunaxa, Secwepemc, *Syilx* Okanagan and Sinixt peoples in the Columbia Basin.
- She also acknowledged that the following day, September 30, is the National Day for Truth and Reconciliation and invited those in attendance to reflect on our responsibilities for contributing to reconciliation and to consider what actions we can takes in our own lives, at work and at home.

BC Hydro Dry Year Operations

Jeremy Benson, Manager, Resource Planning and Coordination, Generation System Operations, BC Hydro

Context

- The Columbia River Treaty outlines the following priorities for water use:
    1. **Domestic & consumptive uses**: In Canada, there are no restrictions on water use from the Treaty reservoirs for domestic consumptive purposes, such as drinking water and irrigation.
    2. **Flood control**: There is a hard upper limit (maximum level) on the reservoirs to manage flood risk that changes throughout the year and between years, depending on the snowpack and other hydrological factors. This takes priority over operating for power generation.

3. **Firm energy**: Reservoirs must be drafted as far as necessary to meet specified firm energy requirements in the U.S. (sometimes called proportional draft). Firm energy is energy that can be reliably provided to meet load, even in the driest year sequences.
4. **Reservoir refill:** Each spring, the Treaty reservoirs are targeted to refill by July 31 to be able to deliver on firm energy requirements for the following year.
5. **Secondary energy**: "Less useful" energy, but not always guaranteed. It depends on seasonal hydrological conditions.
   - The Treaty's purposes are flood control and power generation. Other values, such as fisheries and recreation, are to be managed using Canadian flexibility (moving water between reservoirs), or by mutually beneficial agreements with the U.S., also called supplemental operating agreements.

- Dry year operations are governed by parameters set out in the Treaty (critical rule curves), tied to scenarios for different inflow volumes throughout the Columbia Basin.
- These critical rule curves are developed jointly by the Canadian and U.S. entities[1] based on critical drought periods in the 1930s when there was very little inflow into the reservoirs along the Columbia River four years in a row. BC Hydro models these instances to understand how they would meet firm energy load if similar dry conditions recur.
- Each year, the National Oceanic and Atmospheric Administration issues forecasts for estimated seasonal volume that will flow into the Columbia River between April and August. The estimates are refined throughout the year as data on actual snowpack and precipitation is collected.
- This data is used with the rule curves to determine how reservoirs are drafted.
- Water flowing into the reservoirs comes from the spring freshet – snow melting from mid-April to mid-late June – as well as rainfall events.
- Some glacier melt flows into reservoirs in late summer, typically August. This was the case during this year's heat dome at the end of July.
- For Arrow Lakes Reservoir, half of the refill water typically comes from local inflows and the remainder from upstream facilities.

[1] The Canadian and U.S. Entities were established to implement the Treaty. They work cooperatively and are responsible for the daily operations of the reservoirs and hydroelectric facilities. The Canadian Entity is composed of BC Hydro, responsible for hydroelectric operations, and the Province of B.C., responsible for the disposal of the Canadian Entitlement. The U.S. Entity is composed of the Bonneville Power Administration (BPA), primarily responsible for management of the Columbia River system for hydroelectric power purposes, and the U.S. Army Corps of Engineers (USACE), primarily responsible for flood risk management.

BC Hydro Operations

- The Treaty reservoirs are drafted across the winter and refilled in the spring.
- They typically reach their lowest point in mid-April/early-May and are targeted to refill by July 31 of each year.
- In dry years, inflows are much lower due to less snow and/or rain.
- Despite this, BC Hydro still needs to meet its firm energy requirements under the Treaty.
- Water is still released from the reservoirs to generate electricity, but the inflows are not replacing it, which means the reservoirs are drafted deeper.
- The drier it is in Canada and the U.S., the lower the Canadian Treaty reservoirs are drafted to maintain energy supply in the U.S.
- This is particularly apparent at Arrow reservoir, which is primarily used to meet flood risk management and U.S. energy requirements under the Treaty.
- BC Hydro can use measures at its disposal (listed below) to mitigate dry year impacts to some extent.
    1. Flex (moving water from Kinbasket to Arrow reservoirs)
    2. Non-Power Use Agreement (augments flows to support fish and other objectives)
    3. Arrow Summer Storage Agreement (shifts the release of water out of Arrow reservoir from July to August)
    4. Non-Treaty Storage Agreement (allows the release or storage of water at certain times, which can assist in maintaining higher reservoir levels in Canada)
- The agreements are described in greater detail in the next section.

Supplemental Operating Agreements

- There are other agreements enabled by the Treaty that can affect how Arrow and other reservoirs are managed, called Supplemental Operating Agreements:

    - **Non-Power Uses Agreement**
        - Developed annually to provide fish benefits in Canada and the U.S. from December – July.
        - Benefits to Canada: enhances mountain whitefish and rainbow trout spawning protection below Hugh Keenleyside Dam.
        - Benefits to U.S.: flow augmentation to store up to 1 MAF[2] in Canadian reservoirs, which can be discharged in late spring/early summer to support U.S. salmon objectives.

[2] Million acre-feet is a unit of volume used to measure large bodies of water. One MAF is enough water to cover one acre of land, one foot deep.

- **Arrow Summer Storage Agreement**
  - Supports higher Arrow reservoir levels by delaying Arrow Treaty releases from July to August.
  - Summer storage agreements have been in place several times in the past.
  - BC Hydro anticipated low levels in Arrow reservoir in July 2021 and entered into an agreement with the U.S. Entity to decrease the flows out of Arrow during last 2 weeks of July.
  - Stored water was released in August instead, in order to meet Treaty cross-border flow requirements as of August 31.

- **Non-Treaty Storage Agreement**
  - Covers the extra storage that resulted from building Mica Dam higher than what was required under the Treaty. This extra 5 MAF of storage is not covered by the Treaty, but all use of this storage is made with mutual agreement with the U.S.
  - Long-term commercial agreement between BC Hydro and Bonneville Power Administration (BPA), signed in April 2012 and terminates on September 15, 2024 (or earlier if termination is triggered).
  - Coordinates 5 MAF of storage in Kinbasket reservoir, with BPA and BC Hydro each having continuous access to 1.5 MAF.
  - Both parties benefit from the energy value of generation changes at U.S. federal projects due to the use of B.C. storage to shape releases.
  - BPA has the right to 0.5 MAF of storage releases in May - June for the lowest 20% of water conditions, as long as dry year release rights were not used in the prior year.
  - BC Hydro has similar release rights during dry water conditions in B.C.
  - Non-Treaty Storage Agreement benefits power, flood control, U.S. fisheries and Arrow reservoir levels.

2021 Operations

- 2021 has been one of the drier years on record. Not as dry as 2015 which was the third driest year on record, but drier than 2016 which was the fifteenth.
- Spring snowpack was close to normal, but precipitation was low.
- April, May and June were warm and dry, leading to lower-than-average inflows.
- Dry conditions in 2020 resulted in proportional draft last September, and Arrow reservoir did not refill to full, which meant it started low in 2021.
- It was filling in March because BC Hydro was running more water through Mica Dam turbines to meet electricity demand.

- After March, there was little additional local inflow coming into Arrow and Revelstoke reservoirs. Mica Dam continued to run water through the generators but not as much as usual due to low electricity demand.
- The subsequent ongoing drafting of Arrow reservoir occurred because 1) there wasn't enough energy demand for BC Hydro to increase generation at Mica and 2) there were significant discharge requirements across the border required by the Treaty.
- BC Hydro entered into a Summer Storage Agreement with the U.S., as described on page 4, to defer flows out of Arrow reservoir from July into August.
- Typically, BC Hydro uses electricity generated at Mica to meet energy demand in B.C., and if there is a surplus, to sell on the market to California or Alberta.
- However, the export of electricity is limited by transmission capability.
- There are conversations about upgrading or building more transmission lines in the U.S. to increase capacity.

Summary

- The Treaty requires additional draft in dry years.
- BC Hydro can use measures at its disposal (Flex and Supplemental Operating Agreements) to mitigate impacts to some extent, but there are limits to how effective they are, depending on the severity of the seasonal drought, and can still result in low reservoir levels in Canada.
- BC Hydro is very cognisant of the impacts low levels cause to recreation, navigation and operation of industries on the reservoirs, which is why they try to mitigate these impacts.
- Impacts from dry year operations are significant factors of consideration to Canadian Treaty negotiators.

Columbia River Treaty Update

Brooke McMurchy, B.C. Columbia River Treaty Team

- There are no new updates on the Canada-U.S. negotiations. The Canadian negotiating team is awaiting a response from the U.S. to the proposal tabled by Canada at the 10th round of negotiations in June 2020.
- Canada's Chief Negotiator for the Columbia River Treaty, Sylvain Fabi, and B.C.'s Minister Responsible for the Columbia River Treaty, the Honourable Katrine Conroy, took part virtually in a Water Infrastructure & Policy session at the Pacific NorthWest Economic Region's (PNWER) 30th Annual Summit in August 2021. They spoke about modernizing the Treaty, common myths, and why it's important for both countries to return to the negotiating table.

- CBRAC is encouraged to watch the video of the session and/or read the article about the session in the latest CRT newsletter.
- A technical working group reporting to the Negotiation Advisory Team continues its work to examine scenarios for how the Canadian Treaty dams could be operated differently to meet Basin interests. This work considers factors such as ecosystems, Indigenous cultural values, flood-risk management, hydro power, and other social and economic objectives. The results will inform the Canadian negotiating team on how to address these objectives in a modernized Treaty, and what level of flexibility is needed in B.C. to meet Basin interests.
- Indigenous Nations continue to lead the ecosystem function and Indigenous cultural values research that is informing this process.
- The B.C. Treaty Team continues to make progress on community interest projects, such as the CRT Heritage Project, Creston Valley dikes management, and seeking to increase support for the Basin agriculture sector.
- Apart from these CBRAC webinars, the best way to stay informed on these and other projects is to subscribe to the CRT newsletter.

CBRAC Fall Meeting Update

Brooke McMurchy, B.C. Columbia River Treaty Team

- Plans continue for an in-person CBRAC meeting in Trail, B.C., November 1 – 3, 2021.
- The B.C. Treaty Team and the CBRAC Steering Committee are monitoring COVID-19 cases closely and if the situation does not improve and/or provincial health restrictions change, in particular for the Interior Health region, the meeting will be moved online.
- A final decision will be made by Monday, October 18.
- If the event is in person, there will still be an option to attend by Zoom for those who prefer. All covid precautions will be in place, and proof of vaccination will be required.

UPDATE: After reviewing COVID-19 cases in the Interior Health region and in Trail itself, the CBRAC Steering Committee made the decision to cancel the in-person portion of this meeting. A virtual meeting is being held in its place on November 3, 2021.