

EXECUTIVE SUMMARY

Water use planning is a new process in BC, introduced by the Ministers of Employment and Investment and Environment, Lands and Parks to ensure that provincial water management decisions better reflect changing public values and environmental priorities. A water use plan (WUP) is a technical document that defines how water control facilities (e.g., powerhouses) will be operated. How these facilities are operated will affect many interests in the watershed, such as fisheries, recreation, First Nations, power production, industry, flood control, and others. The goal of water use planning is to develop an operating strategy that achieves the best balance among multiple interests through a participatory, consensus-based process.

The Stave Falls Powerplant is currently being upgraded through the Stave Falls Powerplant Replacement Project. One of the conditions of the Energy Project Certificate (June 1995) for the project requires that a water use plan be prepared for the water control facilities in the Alouette-Stave Falls-Ruskin hydroelectric system. The Alouette WUP was completed in 1996.

The purpose of this report is to present the recommendations of the Consultative Committee of the Stave River Water Use Plan to BC Hydro and the Comptroller of Water Rights. This report will be used by BC Hydro as input when preparing the water use plan that will be submitted to the Comptroller for approval. The Comptroller will consider the input of the Consultative Committee as well as the adequacy of the consultation process when reviewing the proposed water use plan. Accordingly, this report describes:

- the consultation process and analytical approaches used;
- the management objectives and alternatives considered to achieve them;
- the trade-offs associated with the short-listed alternatives;
- the process for reaching consensus; and
- the degree of support for the recommended alternative.

The water use planning process is a 13-step process. The report of the Consultative Committee addresses Steps 1 through 8. BC Hydro conducted the WUP Initiation and Issues Scoping in the fall/winter of 1997/98. At this stage, all interested parties were invited to participate in the Consultative Committee. In the spring of 1998, BC Hydro engaged Compass Resource Management to conduct the trade-off analysis and facilitate Consultative Committee meetings. All of the Stave River facilities are located on Kwantlen First Nation's traditional territory. Kwantlen participated on technical subcommittees, at the main Consultative Committee table and was also consulted separately on issues related to Heritage, Fisheries and Wildlife.

By summer of 1998, the Consultative Committee agreed on the following objectives of the Stave River Water Use Plan:

1. Avoid disruption to industrial operations
 - maintain access to loading/offloading equipment
 - avoid impacts from downstream flooding
2. Support recreational opportunities
 - support Stave Reservoir activities
 - support Hayward Reservoir activities
 - improve safety downstream of Ruskin Dam

3. Support viability of wildlife populations
 - maintain reservoir level stability
 - maintain downstream water level stability
 - ensure periodic flooding of riparian areas
4. Protect and preserve First Nations heritage values
 - protect sites from erosion and illegal collection
 - preserve access to sites
 - recover and interpret artifacts
5. Support viability of fish populations
 - increase spawning capacity
 - increase rearing capacity
 - reduce stranding
 - reduce risk of exposure to elevated levels of Total Gas Pressure
 - increase reservoir productivity
6. Avoid cost increases for electricity production
 - minimize cost of replacement electricity and/or additional programs or works
7. Maximize flexibility to respond to change
 - maximize resilience to and ability to respond to electricity market volatility, scientific uncertainties, etc.
8. Gain knowledge about the system and impacts
 - maximize learning about key uncertainties affecting decision making

For each objective, performance measure(s) were identified. Where possible, performance measures were modeled quantitatively. In other cases, impacts were described qualitatively.

The Consultative Committee generated twelve preliminary operating alternatives designed to meet the objectives (see inset: Summary of Alternatives Developed for SRWUP). The impacts of each alternative on each objective were estimated using the performance measures. The preliminary alternatives were then refined into a number of combination strategies. Eventually, two very distinct strategies – Combo 4 and Combo 5 – were short-listed and evaluated in detail.

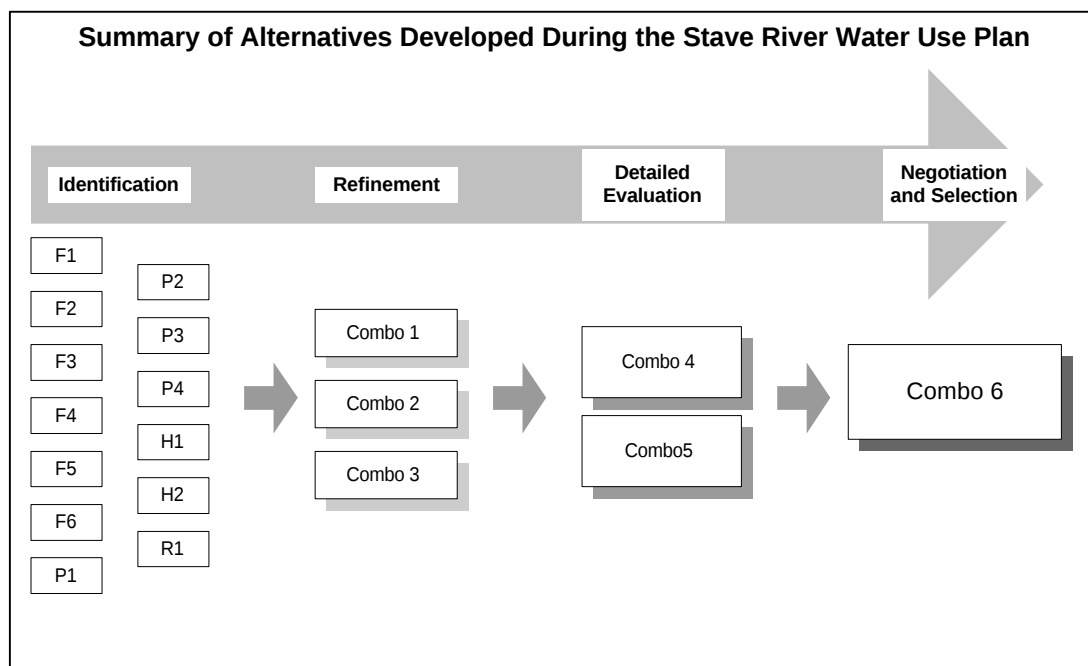
Downstream of Ruskin Dam, both of the short-listed strategies contain the same components. This demonstrates the success of the process in finding joint gains through a creative option identification process. In Stave Reservoir, the short-listed strategies represent fundamentally different approaches to operations. The choice between them is value-based.

Combo 4 was specifically designed to increase the stability of the reservoir for the primary purpose of enhancing reservoir productivity. It was proposed that this strategy could also improve the viability of the riparian ecosystem in the drawdown zone, and thus improve the aesthetic and recreational value of the area. Because the upper and lower bounds (of the target water level) were allowed to be violated in order to protect minimum flows required for the protection of downstream spawning and rearing habitat, Combo 4 provided reduced fluctuations in reservoir elevations (reduced in magnitude and frequency), but not a fully stable reservoir. Evaluating the benefits of this alternative was complicated by scientific uncertainty about the magnitude of the benefits of a partial stabilization of the reservoir for fish and other ecosystem attributes.

Combo 5 was a refinement of baseline (current) operating conditions, with modifications specifically in consideration of heritage and recreation interests. Although Combo 5 does not set a year-round reservoir target in an explicit attempt to stabilize the reservoir, modeling indicates that in combination with the proposed downstream changes, this strategy would also improve the stability of Stave Reservoir, albeit to a lesser extent than Combo 4.

The Consultative Committee evaluated the trade-offs between these two alternatives in detail. In order to reach consensus, a new combination was developed, which is essentially the operating strategy from Combo 5 with the addition of a significant investment in monitoring to reduce key uncertainties related to reservoir productivity and First Nations heritage objectives.

The Consultative Committee reached a consensus agreement on the “Combo 6” package of recommendations on June 24, 1999.



In total, the package of recommendations of the Consultative Committee to BC Hydro includes recommendations on:

- an operating strategy;
- an on-going management plan;
- structure and membership of a management committee; and
- timing of implementation and review.

The recommended operating strategy consists of the following elements:

- maintain all of the constraints that had previously been implemented as part of the Electric System Operating Review (ESOR) in 1995, with the exception of the 130 cubic meter per second maximum Ruskin discharge constraint during the fall spawning period. This includes:
 - weekly block loading at Ruskin powerplant during the fall spawning period;
 - minimum water levels (tailwater elevations) year round;
- Implement daily block loading during the period of fry emergence (officially February 15 to May 15, but subject to annual adjustment if mutually agreed with DFO);
- Modify the block loading procedure to allow partial peaking (above 100 cubic meters per second) during both spring and fall block loading;
- Allow for lower than current normal minimum elevations on Hayward Reservoir during the spring and fall block loading periods;
- Provide a six-week deep drawdown on Stave Reservoir for heritage interests one year in three, on average, with timing and depth of drawdown dependent on opportunities provided by inflow conditions and the needs of Kwantlen First Nation;
- Set a soft target 80-81.5 meters for Stave Reservoir elevation during the peak recreation season (with priority given to maintenance of downstream flows).

The recommended management plan consists of four components.

- A fisheries management plan including:
 - Reservoir Productivity Monitor (Phase 1 and 2);
 - Limited Block Loading Monitor; and
 - On-going management activities, including mitigation or other response to information on impacts gained from the monitoring programs.
- A heritage management plan, including:
 - a heritage monitoring plan;
 - on-going inventory, monitoring and assessment of sites throughout the watershed;
 - drawdown work, including inventory, monitoring and assessment as well as mitigation and artifact recovery on sites located at lower elevations of Stave Reservoir; and
 - mitigation activities.
- A drinking water quality monitoring plan, which includes turbidity monitoring in Hayward Reservoir.
- Reporting and administration, which includes:

- preparation, production and distribution of an annual report on management committee activities
- a monitoring plan “custodian” to ensure continuity of the plan.

The management plan costs vary from year to year, but result in a levelized annual cost of about \$390,000. (Note that the WUP as a whole has a net gain of \$120,000 per year, which is the difference between annual gains in power value of \$510,000 and the management plan costs – see Financial performance in the table below.)

The Consultative Committee recommends that a Stave Management Committee be formed, with membership to include the Department of Fisheries and Oceans, Ministry of Environment, Lands and Parks, BC Hydro, Kwantlen First Nation and the District of Mission. Tasks of the Management Committee include:

- design, refine and implement monitoring programs and review results;
- identify and prioritize mitigation needs and implement related activities within the established budget;
- liaise with the Alouette Management Committee to make decisions when and if trade-offs in water allocation are required between Alouette Lake water levels and the Stave system;
- liaise with Kwantlen First Nation on issues related to heritage management;
- prepare an annual public report;
- conduct an interim review after five years.

The Consultative Committee also made recommendations related to the timing of implementation and review:

- Conduct a full review of the Stave River Water Use Plan (involving a comprehensive multi-party consultation process) after ten years. This recommendation is linked to the expected timing of results from monitoring programs addressing key uncertainties.
- Conduct a formal interim review (by the Management Committee) after five years based on monitoring results to date. The purpose is to identify any unexpected results, adjust mitigation plans and budgets accordingly, adjust monitoring plans as necessary to ensure adequate information will be available at the ten year review, and reconfirm the appropriateness of the timing of the ten-year review.
- Implement the recommended operating strategy immediately upon start-up of the Stave Falls Replacement Project.

The impacts from the recommended package are summarized below. Some of the impacts are uncertain. The most significant uncertainties were investigated and a range of values were considered by the Consultative Committee as the trade-offs were evaluated.

SUMMARY OF IMPACTS OF THE RECOMMENDED PACKAGE

OBJECTIVE	IMPACT OF COMBO 6
Fish – Downstream - <i>Spawning</i> - <i>Rearing</i> - <i>Egg Stranding</i> - <i>Total Gas Pressure</i>	Slight improvement in overall productive capacity expected (Reductions in spawning habitat offset by improvements in rearing habitat and egg stranding risks)
Fish – Reservoir - <i>Reservoir Productivity</i>	21% increase in overall reservoir carbon production 830 hectare increase in effective littoral zone
Industry	- Better access to loading/off-loading equipment and woody debris on Stave Reservoir - Reduced risk of incurring damage to downstream equipment due to spills
Recreation	- More days at preferred elevations during the recreation season - Potential for an improved fishery - No boating access in March, one year in three
Wildlife	Slight improvement due to increased stabilization of Stave Reservoir
Heritage	Improved access and protection for First Nations heritage sites and artifacts
Financial Cost (Relative to ESOR)	Net gain of about \$120,000 per year (levelized annual value, calculated as the difference between gains in power values of \$510,000 (see Note 1) and on-going management costs of \$390,000)
Learning	- Substantial knowledge will be gained about reservoir productivity processes and the impact of operations on littoral habitat and fish productivity - Substantial knowledge will be gained about the impact of operations on First Nations interests
Flexibility	On-going management structure and funding allows effective response to new information or priorities

Notes

- \$510,000 is an upper estimate. The actual value will be between \$440,000 and \$510,000. Lack of precision is due to difficulties in modeling the “opportunistic” one-in-three-year heritage drawdown. The \$510,000 figure was used throughout the consultation, with the understanding that it was a slight overstatement of actual benefits. The lower bound of \$440,000 was developed by BC Hydro after the consensus agreement of the Consultative Committee.

Eighty percent of Consultative Committee members reported that they “endorse” the package, while twenty percent “accept” it. (See inset on definition of terms.)

Of those recording “accept”, the reasons that prevented them from “endorsing” the package included:

- several participants highly valued the potential for greater ecosystem, fish and aesthetic improvements that they believe could result from greater stabilization of Stave Reservoir;
- one participant had reservations about the high cost of monitoring programs in Years 1 and 2, and would only be able to “Endorse” the package if those were smoothed out (not necessarily to provide a lower overall investment, but to provide a more consistent level of investment from year to year).

Of those reporting “endorse”, minor reservations were expressed by three participants about the cost of the management plan, and the following recommendations made:

- limit the tasks to only those really necessary;
- manage the monitoring work closely to ensure it delivers the intended benefits.

In summary, the Stave River Water Use Plan Consultative Committee succeeded in achieving a consensus on an operating plan and related recommendations to BC Hydro and the Comptroller of Water Rights. The consultation process allowed the development of creative alternatives and the detailed evaluation of two distinctly different operating alternatives. It allowed each participant to apply their own values when making trade-offs among objectives. Through interest-based discussions and negotiation, a consensus agreement was reached which all participants support. The recommended operating strategy provides gains with respect to all objectives, relative to current operations.

Definition of Consensus Used in SRWUP

The following definitions were provided to the CC, and were used to gauge support for the short-listed strategies.

Endorse: You endorse the proposed alternative, either fully or with minor reservations.

Accept: You accept the proposed alternative. You may disagree that the alternative represents the best possible solution, but your minimum needs are met. You may want your views formally recorded, but you accept and support the decision of the group.

Block: You can not support the proposed alternative. Your minimum needs are not met.

“Endorse” and “Accept” both constitute consensus. The more people who are under the “accept” category, the weaker the consensus, but it remains a consensus decision. If anyone in the group finds it necessary to “block”, then consensus is not achieved. Where consensus is not achieved, areas of disagreement will be noted, and we will document what it would take to meet minimum needs.

The process was complicated by uncertainty about a number of impacts. As a result, the consensus agreement is contingent on the implementation of an adaptive management plan that will address key uncertainties and ensure that improved information is available for the next review of the Stave River WUP.