

RECOMMENDATION OF RIO TINTO ALCAN INC.

Rio Tinto Alcan Inc. (“RTA”) submits that the Commission should adopt the following recommendation:

“The Nechako Watershed Conservation Program’s Summer Temperature Management Program should continue in its current form.”

SUMMARY OF WRITTEN FINAL SUBMISSION OF RIO TINTO ALCAN INC.

RTA submits that the evidence on the record demonstrates that:

- the Nechako River Summer Temperature Management Program (“STMP”) benefits sockeye salmon, and
- changes to the STMP could adversely affect sockeye salmon, other aquatic species, or other Nechako River watershed stakeholder interests.

Accordingly, no changes should be made and the STMP should continue in its current form.

Additionally, given that:

- the Nechako Environmental Enhancement Fund (“NEEF”) Management Committee has been reconvened to consider how to make use of NEEF funds for downstream enhancement of the Nechako watershed area, and
- research now shows that either a Cold Water Release Facility or a Surface Water Release Facility may cause negative impacts downstream,

the Commission should make no recommendation concerning either facility.

17 October 2011

**COMMISSION OF INQUIRY INTO THE
DECLINE OF SOCKEYE SALMON IN THE FRASER RIVER**

**WRITTEN FINAL SUBMISSIONS OF
RIO TINTO ALCAN INC.**

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WRITTEN FINAL SUBMISSION OF RIO TINTO ALCAN INC.

I. INTRODUCTION

1. Rio Tinto Alcan Inc.'s ("RTA") submission focuses exclusively on the evidentiary hearing topic "Hydro, water flow and temperature" under the "Causes for the decline of Fraser River sockeye salmon" heading in the final submissions template provided by Commission Counsel.
2. More specifically, RTA's submission concerns its operation of the Kemano System and the Nechako Reservoir, which has provided hydro-electric power to RTA's Kitimat Smelter for over 50 years. An important aspect of those operations is the Summer Temperature Management Program ("STMP"), which is reservoir management protocol designed to release cooling water from the Nechako Reservoir during portions of July and August to assist the transit of sockeye salmon through the Nechako River during this time.
3. RTA's recommendation to the Commission is:

The Nechako Watershed Conservation Program's Summer Temperature Management Program should continue in its current form.

4. RTA's submissions are organized as follows:
 - a) RTA's Standing before the Commission
 - b) RTA Operation of the Kemano system
 - c) Summer Temperature Management Program: History and Results
 - d) Potential Changes to the Summer Temperature Management Program
 - e) Conclusion and Recommendations

II. ARGUMENT

A. RTA Standing before the Commission

5. RTA's standing was granted on the following basis:

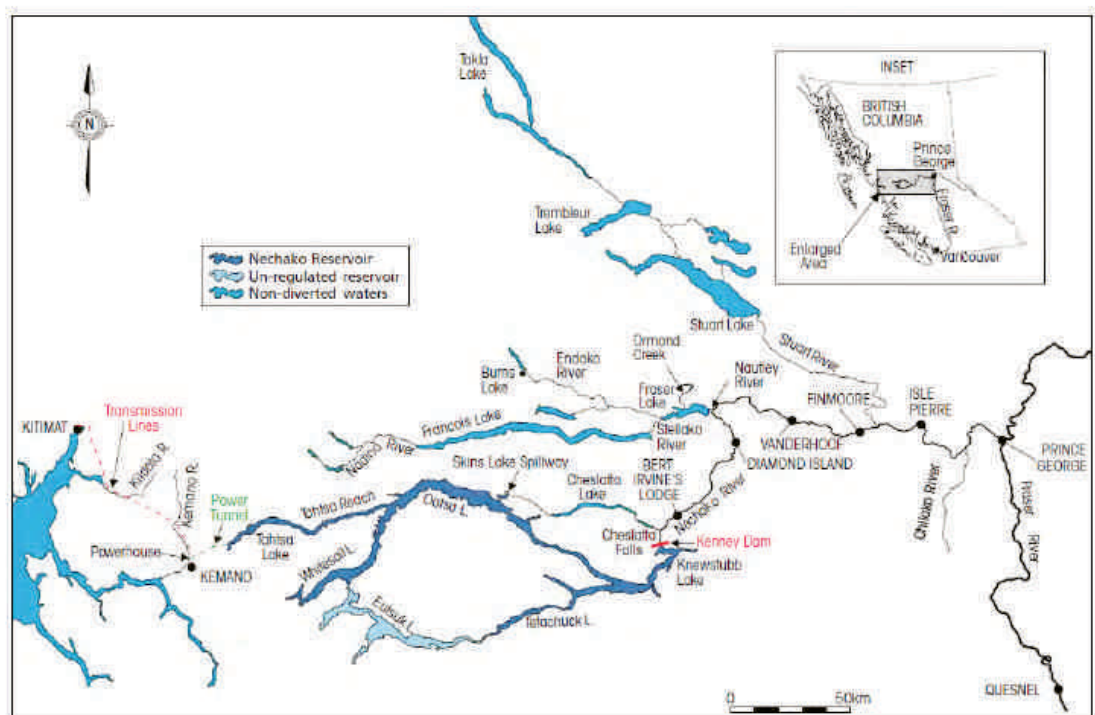
[RTA's] substantial and direct interest is in environmental changes along the Fraser River and other factors within the Fraser River watershed including the Nechako system which affect the ability of Fraser River sockeye to reach

*spawning grounds or the ocean, and the policies and practices of the DFO as they relate to these subjects.*¹

B. RTA Operation of the Kemano System

6. The Kemano System is a hydroelectric facility operated by RTA (formerly Alcan Inc.). It supplies power to RTA's aluminum smelter at Kitimat, British Columbia as well as to BC Hydro. The Kemano powerhouse is located on the Kemano River, while the Nechako Reservoir which supplies water to the Kemano powerhouse is located at the headwaters of the Nechako River. Water reaches the powerhouse from the reservoir via a 16 km tunnel through the Coast Mountains.²
7. The Nechako Reservoir waters are impounded by the Kenney Dam and nine saddle dams. Controlled flows are released from the Nechako Reservoir by the Skins Lake Spillway. These facilities are show in the following figure reproduced from the Water Uses PPR.³

Figure 11: Aerial perspective of the Nechako River watershed and facilities associated with the Kemano Power Project



¹ Commission Standing Ruling at p. 16, para. 49.

² Water Uses PPR at pp. 57-58; see also Technical Report 3, Exhibit 562 at pp. 36-37 and testimony of Dr. Macdonald, transcript September 15, 2011, at p. 18 l. 27 – p. 19 l. 47.

³ Water Uses PPR at pp. 60.

8. The Kemano System facilities were constructed during the early 1950s after the Province of British Columbia invited the Aluminum Company of Canada Limited (now RTA) to develop a hydroelectric power project and establish an aluminum industry on Canada's west coast.⁴
9. The diversion of Nechako Reservoir volumes to the Kemano powerhouse reduced the flow of the Nechako River. In the early 1980s, the federal Department of Fisheries and Oceans ("DFO") commenced litigation against Alcan Inc. (now RTA) because of concerns that low flows in the Nechako would result in high water temperatures detrimental to migrating sockeye salmon. The litigation was resolved by a settlement agreement between DFO, Alcan, and the Province of British Columbia – the "1987 Settlement Agreement."⁵

C. Summer Temperature Management Program: History and Results

(i) History of the STMP

10. The 1987 Settlement Agreement established the Summer Temperature Management Program ("STMP"). The STMP is a water release temperature control program designed to assist the Nadina and Stellako sockeye runs when they transit through the Nechako River to their ultimate spawning grounds. However, research has shown that the STMP not only benefits those stocks, but Early Stuart stocks as well.⁶
11. The STMP employs a sophisticated predictive model that assesses the conditions of the Nechako River and determines the water releases necessary to achieve the water temperature target of 20 degrees C at Finmoore on the Nechako River.⁷ RTA then releases water from its Nechako Reservoir to meet the STMP parameters.
12. The operation of the STMP and the monitoring of its effectiveness is overseen by the Nechako Fisheries Conservation Program ("NFCP"), which was established under the 1987 Settlement Agreement. The NFCP is administered by DFO, the Province and RTA.⁸
13. The STMP runs for 32 days during the summer, between July 20 and August 20. There are also 10 days of releases between July 10 and July 20 to "pre-charge" the Cheslatta Lake system, to allow the STMP to respond to temperature conditions in real time.⁹

⁴ Exhibit 562, Technical Report 3 at p. 37.

⁵ Water Uses PPR at p. 62; also see also Exhibit 562, Technical Report 3 at p. 37.

⁶ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 23, ll. 16-38.

⁷ Water Uses PPR at p. 64; testimony of Dr. Macdonald, transcript September 15, 2011, p. 22, ll. 13-21.

⁸ Water Uses PPR at p. 63, para. 152.

⁹ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 22, ll. 22-39.

(ii) STMP Results

14. The substantial and uncontroverted evidence on the record is that the STMP has successfully benefitted sockeye salmon throughout its history. In Dr. Macdonald's words: "In a nutshell, it works"¹⁰ and "I sure hope it continues."¹¹
15. The evidence also shows that changes to the STMP would risk causing negative effects to both sockeye salmon and Nechako watershed stakeholders.
16. Technical Report No. 3 and Policy and Practice Report No. 21 ("Water Uses PPR") both identify the success of the STMP. They each note that, in evaluating the STMP, the NFCP "found that water temperatures have generally remained between 15°C and 21°C, while only infrequently exceeding [the target maximum temperature of] 20°C."¹² Technical Report No. 3 provides the following table quantifying STMP results:¹³

Table 10. Number of days when the mean daily water temperature exceeds 20°C, and maximum and minimum mean daily water temperatures in the Nechako River above the Stuart River, July 20 to August 20, 2002 to 2009 (data from Triton Environmental Consultants Ltd. 2003 through 2010 as part of NFCP water temperature and flow management program). Data from 2007 were not reported due to failure of thermographs.

Year	Number of days >20°C	Maximum mean daily water temperature	Minimum mean daily water temperature
2001	0	19.6	16.4
2002	0	19.9	14.4
2003	0	20.0	17.1
2004	13	21.2	18.7
2005	0	20.0	16.8
2006	5	21.7	17.8
2008	0	19.5	15.7
2009	11	21.4	17.3

17. The table above shows that in five of the eight years reported there were no exceedences of the 20 C target. The three years there with exceedences were also warm years, in that they also had the highest maximum and highest minimum mean daily water temperatures. Mr. Hwang was DFO's representative to the NFCP for the 1998-2004 period, and described the STMP as "largely effective, not perfectly so, but within the bounds and limits of the operating infrastructure, it was meeting objectives...."¹⁴
18. The Water Uses PPR also quotes DFO scientists' conclusions that:
- the STMP has been "an effective strategy" in reducing water temperatures at Finmoore, and

¹⁰ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 24, l. 43.

¹¹ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 25, l. 11.

¹² Water Uses PPR p. 65, para. 158; Exhibit 562 at p. 38.

¹³ Exhibit 562, Technical Report 3 at p. 101.

¹⁴ Transcript, September 16, 2011, p. 31, ll. 39-42.

- the STMP benefits sockeye salmon downstream of Finmoore by cooling Nechako River temperatures downstream of Finmoore.¹⁵
19. The DFO conclusions were drawn from two related expert reports entered onto the record.¹⁶ Dr. Macdonald was one of the authors of each report.¹⁷ The first report relied on empirical evidence to conclude that “increased water volume retards the rate at which water temperature increases as it proceeds downstream.”¹⁸ It cautions that proposals to release smaller volumes of colder water from the Kenney Dam could erode the benefits Early Stuart sockeye salmon receive in the lower Nechako River, downstream of the Stuart River confluence and during the warmest portion of their migration.¹⁹
 20. The second report also correlated Nechako River temperatures with the volumes of water released from the Skins Lake Spillway. The report found that these volumes were second only to air temperature in influencing the water temperature recorded at Finmoore. This result “provided credence to the efficacy of the SMTP protocol.”²⁰ The second report also concluded that the STMP “nearly always had a moderating influence at the confluence with the Stuart River during most days of most summers.”²¹ During his testimony, Dr. Macdonald put it this way: “any fish that turns left at Prince George stands to benefit from temperature control.”²²
 21. There is evidence on the record that speculates about implications of lowering the STMP’s temperature target at Finmoore to 18 degrees Celsius.²³ Dr. Macdonald explained, however, that this evidence reflects thinking where he (the author) is “living in a perfect world” and does not take into account the “plethora of other interests.”²⁴ In other words, this evidence focuses exclusively on salmon, and ignores potential negative consequences to other interests that may result from lowering the target. These include the physical limitations of the Cheslatta Lakes

¹⁵ Water Uses PPR, pp. 65-66, para. 159.

¹⁶ Exhibit 1847, Examination of Factors Influencing Nechako River Discharge, Temperature, and Aquatic Habitats, and Exhibit 1848, The Efficacy of Reservoir Flow Regulation for Moderating Migration Temperature for Sockeye Salmon in the Nechako Watershed.

¹⁷ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 24, l. 4.

¹⁸ Exhibit 1848, The Efficacy of Reservoir Flow Regulation for Moderating Migration Temperature for Sockeye Salmon in the Nechako Watershed, p. 23.

¹⁹ *Ibid.*

²⁰ Exhibit 1847, Examination of Factors Influencing Nechako River Discharge, Temperature, and Aquatic Habitats, p. 14.

²¹ *Ibid.*, p. 15.

²² Transcript September 15, 2011, p. 23, ll. 30-31.

²³ Exhibit 1849, Nechako Cold Water Release Facility (CWRP) Summary of DFO Position; see also Exhibit 1853, Kenney Dam Cold Water Release Facility Interim Report 2002-2007 with cover letter from Henry Klassen, Nechako Watershed Council to Honourable Gail Shea, Minister DFO, December 3, 2009 at pdf p. 32.

²⁴ Transcript, September 15, 2011, p. 30 l. 4 and p. 28, l. 29, respectively.

system, flooding at the town of Vanderhoof, safety aspects of operating the Kenney Lake dam, and lost electricity generation and associated revenue.²⁵

22. The foregoing evidence demonstrates that the STMP has been effective. It has not been challenged by any other participant or evidence on the record. RTA submits that it is therefore the best evidence on the record, and should be accepted by the Commission.

D. Potential STMP Changes

23. The record also contains evidence describing measures that could change the STMP. These are the Cold Water Release Facility (“CWRF”) and the Surface Water Release Facility (“SWRF”). This section provides an overview of that evidence, and then explains why neither option is required to improve conditions for sockeye salmon which is why neither option is currently expected to be implemented. The Macdonald reports discussed above also explain that reducing the volume of water releases from the Skins Lake Spillway would reduce the cooling benefits provided beyond the confluence of the Stuart and Nechako rivers.

(i) Cold Water Release Facility

24. The Water Uses PPR describes the background behind the Cold Water Release Facility formerly proposed for the Kenney Dam. Briefly, RTA began construction of the Kemano Completion Project (“KCP”) in 1988. KCP was contemplated by the 1987 Settlement Agreement. KCP became the subject of litigation between RTA and the federal government as well as a public review by the BCUC. While the BCUC issued a report that did not recommend for or against KCP, the provincial government rejected the project in 1995. This resulted in litigation between RTA and the province, which the two parties settled in 1997.²⁶
25. The 1997 Settlement Agreement included the creation of the Nechako Environmental Enhancement Fund (“NEEF”) and the Nechako Watershed Council (“NWC”). The NWC is an advisory body representing community, government, business and first nations interests. The Management Committee of the NEEF has a mandate to “review, assess and report on options available for the downstream enhancement of the Nechako watershed area.” Under the 1997 Settlement Agreement, RTA contributed \$50 million to NEEF on the condition that another party provides matching funds.²⁷

²⁵ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 28 l. 16 – p. 29 l. 13.

²⁶ Water Uses PPR at pp. 66-67, paras. 161-162.

²⁷ Water Uses PPR at pp. 67-68; see Exhibit 1853, Kenney Dam Cold Water Release Facility Interim Report 2002-2007 with cover letter from Henry Klassen, Nechako Watershed Council to Honourable Gail Shea, Minister DFO, December 3, 2009 at pdf pp. 30-32 generally (“Executive Summary” section); also see testimony of Mr. Hwang, transcript September 16, 2011, at p. 32.

26. Following several years of consultation, the NEEF Management Committee recommended construction of a Cold Water Release Facility (“CWRF”) located at Kenney Dam in 2001. The CWRF would change the STMP by releasing colder water from deeper in the Nechako Reservoir. This water would be released at the Kenney Dam instead of at the Skins Lake Spillway.²⁸
27. Releasing colder water was projected to require less water volumes than the STMP requires. Lower release volumes would allow more water to be available for other uses.²⁹ However, additional analysis by DFO determined that the “freed up flows” projected to result from the CWRF were likely to materialize in smaller volumes than expected. Dr. Macdonald explained that colder water heats up quicker than warmer water, given that the rate of warming is proportional to the temperature differential between the water temperature and the air temperature. Dr. Macdonald’s research has been generally accepted, and as a result the CWRF is no longer being considered as a viable option.³⁰
28. In June 2008, the NWC determined that a CWRF was no longer the preferred option because of engineering risks, escalating costs and a lack of “freed up” flows.³¹

(ii) Surface Water Release Facility

29. A Surface Water Release Facility (“SWRF”) was considered instead of the CWRF. It would not release colder water, but would be cheaper and result in some of the other environmental benefits.³² However, following more detailed cost estimates the NEEF Management Committee has been reconvened to consider other projects instead of the SWRF. The reason for this, according to Mr. Davidson, is:

[T]here's been...in the order of ten years of work [and] we've realized the costs are considerably higher. The risks are high. It might not meet

²⁸ *Ibid.*

²⁹ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 31 l. 1 – p. 33 l. 16; also see Water Uses PPR at p. 67, para. 163 and Exhibit 1853, Kenney Dam Cold Water Release Facility Interim Report 2002-2007 with cover letter from Henry Klassen, Nechako Watershed Council to Honourable Gail Shea, Minister DFO, December 3, 2009, at pdf pp. 12-13 and 31 (“Addendum Report” at pp. 1-2 and “Executive Summary” at p. 2”).

³⁰ Water Uses PPR at pp. 67-69, paras. 163-165; testimony of Dr. Macdonald, transcript September 15, 2011, pp. 31 l. 1 – p. 32 l. 47; Exhibit 1853, Kenney Dam Cold Water Release Facility Interim Report 2002-2007 with cover letter from Henry Klassen, Nechako Watershed Council to Honourable Gail Shea, Minister DFO, December 3, 2009, at pdf p. 32 (“Executive Summary” p. 3).

³¹ Exhibit 1853, Kenney Dam Cold Water Release Facility Interim Report 2002-2007 with cover letter from Henry Klassen, Nechako Watershed Council to Honourable Gail Shea, Minister DFO, December 3, 2009, at pdf p. 32 (“Executive Summary” p. 3).

³² *Ibid.*

*objectives, so it's, I think, appropriate to reconvene NEEF...and see if there's a better use of the fund.*³³

30. Mr. Hwang estimated the “all-in” cost of the SWRF at about \$259 million, with approximately \$150 million attributable to the cost of the facility itself. Mr. Hwang also provided an estimate of \$190 million as a dated cost for a CWRF.³⁴
31. Other challenges facing the SWRF include erosion and downstream transport of large volumes of sediment downstream from the Nechako canyon, particularly at the Cheslatta Fan (located at the outfall from the Cheslatta System where it joins the Nechako River), and raising the mean temperature downstream of Finmoore in a manner that may adversely affect sockeye, despite continuing to adhere to the 20 degree Finmoore target. If a SWRF was operated to benefit interests other than sockeye salmon, it could make conditions worse for sockeye salmon.³⁵
32. Given the potential challenges posed by the CWRF and SWRF proposals, and given that the NEEF Management Committee has been reconvened to examine these issues in detail, RTA submits that the Commission should make no recommendations concerning either facility.

E. Conclusions and Recommendations

33. RTA submits that the record is clear that the STMP has successfully moderated the temperature of the Nechako River, and that doing so is beneficial to sockeye salmon. RTA further submits that changing the STMP, either by way of a new temperature target or a water release facility, risks downstream impacts that may be detrimental to sockeye salmon or other Nechako River interests.
34. For all these reasons, RTA submits that the Commission should adopt its suggested recommendation that the STMP should continue in its current form.

Submitted this 17th day of October, 2011

“Original signed by”
Counsel for Rio Tinto Alcan Inc.

³³ Testimony of Messrs. Hwang and Davidson, transcript September 16, 2011, p. 34, ll. 1-26.

³⁴ Testimony of Mr. Hwang, transcript September 16, 2011, p. 33, ll. 15-35.

³⁵ Testimony of Dr. Macdonald, transcript September 15, 2011, p. 35, ll. 2-45.