

Partial Assessment Phase 1 Draft Bookend Alternatives

WEI Meeting 28 - Wednesday, Sep 21, 2022

Michael Harstone, Compass Resource Mgt
Clayton Schroeder, Compass

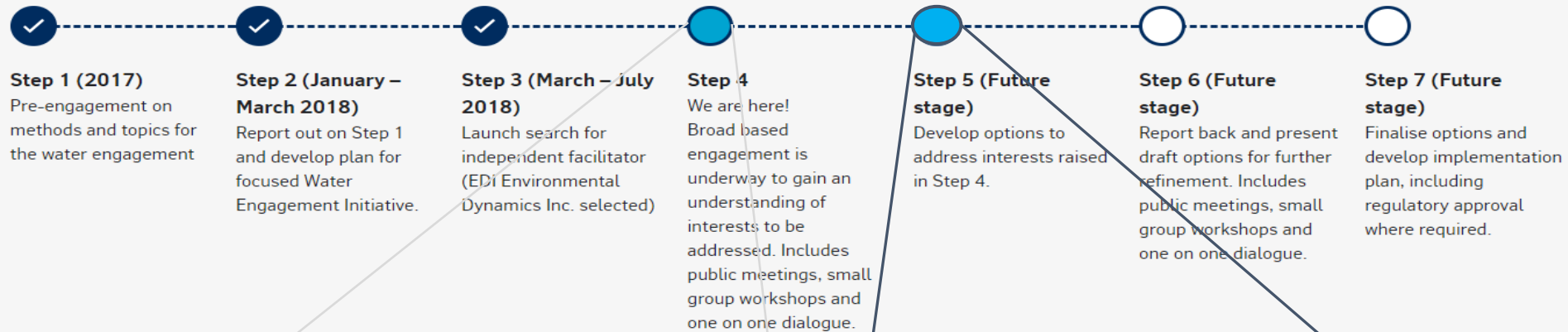


Jayson Kurtz, Ecofish Research
Katie Healey, Ecofish

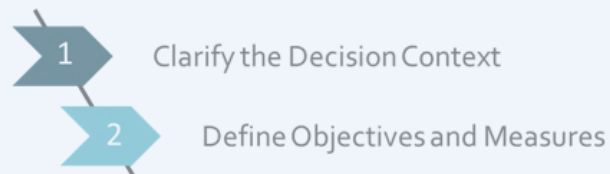


Nechako WEI Process Steps

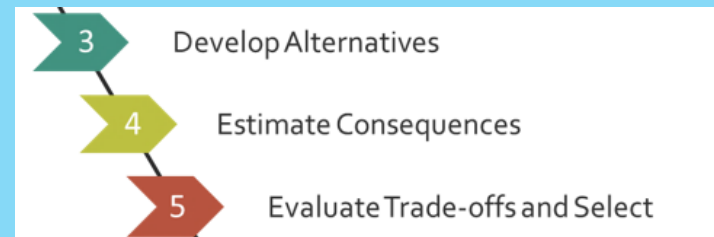
Timeline



Focus up to now



Upcoming Focus



Assessment of Flow Alternatives – Snapshot Overview

Purpose

To explore and determine ways to improve Rio Tinto water management operations on the Nechako, given the multiple and competing water uses

Schedule

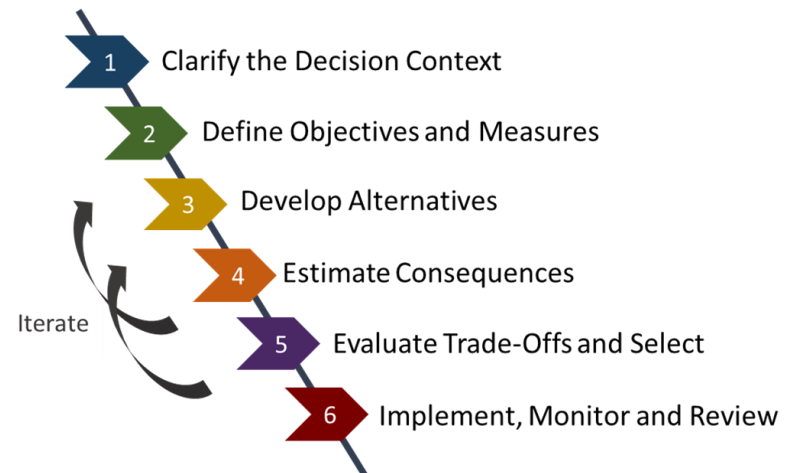
- Multiple Main Table Meetings over the next 12 months or so
- ~ 1 day meetings every 6-8 weeks

Planning Framework

Structured Decision Making (consistent with *Provincial WUP Guidelines*)

WEI Main Table

To collaboratively share interests; identify and assess different flow alternatives; and **aim to reach agreement on a preferred (and balanced) flow regime** for the water control facilities





Our Road Ahead

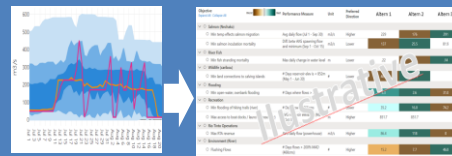
Refresher from our last meetings

SDM Process Steps: as discussed



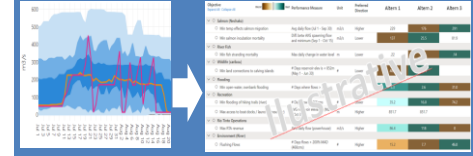
ROUND 1

- Alt 1
- Alt 2
- Alt 3
- Alt 4
- Alt 5
- Alt 6
- Alt 7



ROUND 2

- Alt 1
- Alt 2
- Alt 7
- Alt 10
- Alt 11
- Alt 12
- Alt 13



ROUND ...

- Alt 1
- Alt 2
- Alt 7
- Alt 10
- Alt 11
- Alt 12
- Alt 20
- Alt 21
- Alt 22

Refresher from our last meetings

Structure and Sequencing – as agreed to

Phase 1 (Immediate Term)

Phase 1 Flow Alternatives

- Flow alternatives that Rio Tinto could unilaterally make within the immediate term (e.g., next calendar year) with notification to regulators, First Nations and stakeholders with time to undertake any internal assessments that may need to be carried out.

Phase 2 (Near & Med Term)

Phase 2 Flow Alternatives

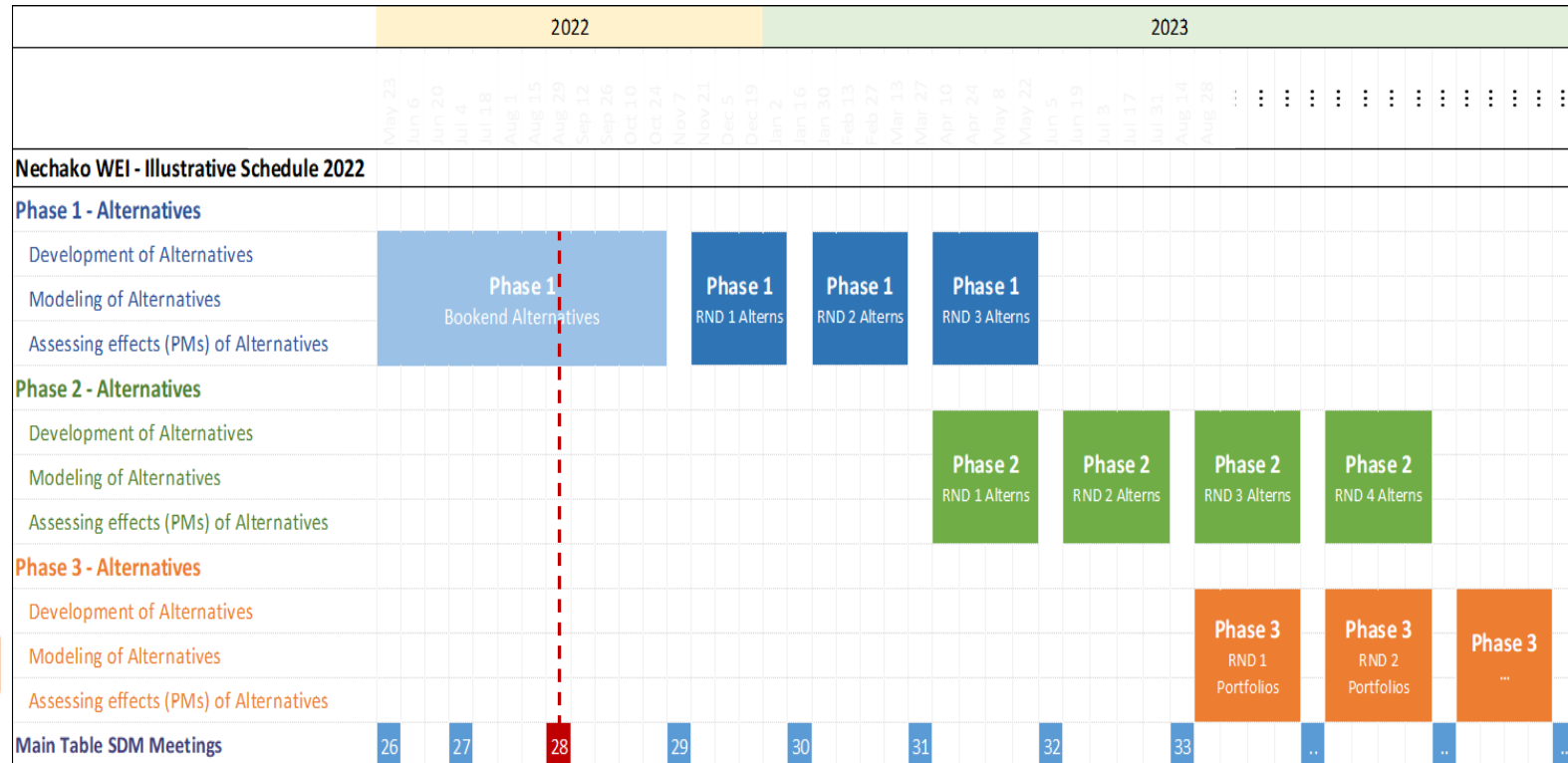
- Flow alternatives that would require Rio Tinto to seek some form of approval / authorization(s) according to their existing water license and/or flow related agreements and/or commitments with First Nations.

Phase 3 (Med & Longer Term)

Phase 3 Flow Alternatives

- Combination of new water management facilities (mitigation / enhancement projects) and potential changes to flow releases to the Nechako River to maintain and/or improve conditions related to key water uses.

Draft Workplan: as discussed



About Today



About Today



Pre-Reading that
was sent out ➔

Nechako Water Engagement Initiative
Pre-Reading Package – Main Table Meeting 28
Sept 21st, 2022

Some Opening Comments... first off, we are sorry for the late delivery of this!

This pre-reading package serves as a primer with needed background information on the **"partial assessment"** of bookend alternatives which will be the focus of our upcoming Main Table Meeting 28 on September 21st, 2022. It should take no more than about an hour or so to read, as some parts have been presented before.

Please take the time to read and become familiar with the information and context summarized in this pre-reading package, as it will serve as the basis for our upcoming discussions.



As highlighted at our last meeting (Meeting 27 held on May 25, 2022), the WEI process is entering the next step in its collaborative approach (i.e., moving to Step 5) where we will begin developing and exploring alternative flow options for the operation of Rio Tinto's water control facilities (i.e., how water is held and released). This next phase is really the heart and soul of the structured decision making (SDM) process that the Nechako WEI has adopted and is following. We also want to emphasize that this next phase builds on all the hard work that has been carried out up to this point through the identification and scoping of issues and in the development of preliminary performance measures.

Timeline

Step 1 (2017)	Step 2 (January – March 2018)	Step 3 (March – July 2018)	Step 4	Step 5 (Future stage)	Step 6 (Future stage)	Step 7 (Future stage)
Pre-engagement on methods and topics for the water engagement	Report out on Step 1 and develop plan for focused Water Engagement Initiatives	Launch search for independent facilitator (SD Environmental Dynamics Inc. selected)	We at least know based on engagement is underway to gain an understanding of interests to be addressed. Includes public meetings, small group workshops and one-on-one dialogues.	Develop options to address interests raised in Step 4.	Report back and present draft options for further refinement. Includes public meetings, small group workshops and one-on-one dialogues.	Finalize options and develop implementation plan, including regulatory approval where required.

At our last meeting, the Main Table agreed to seven Phase 1 Bookend Alternatives to be further developed and modeled over the summer. The TWG reviewed and further refined these alternatives so they could be modeled and assessed this fall. Please remember the purpose of the Phase 1 Bookend Alternatives are meant as a starting point to: (1) learn about the hydrology of the system, (2) scope out flow sensitive water uses, (3) test out the draft performance measures that are being developed, and perhaps most importantly (4) to gain insight on building new and improved flow alternatives at future meetings.

For our upcoming meeting on Wed (Sep 21), three of the first Phase 1 Bookend Alternatives have been modeled and will be assessed using a **"partial"** set of draft performance measures that have been vetted and recommended by the TWG and Ecofish. In other words, we are only undertaking a **"partial assessment"** at our upcoming meeting with 3 out of the 7 Phase 1 Bookend Alternatives that were agreed to. Therefore, this meeting should be viewed as a dress rehearsal to get ready for the **"full assessment"** of all the Phase 1 Bookend Alternatives at our Oct 26 Main Table (Meeting 29).

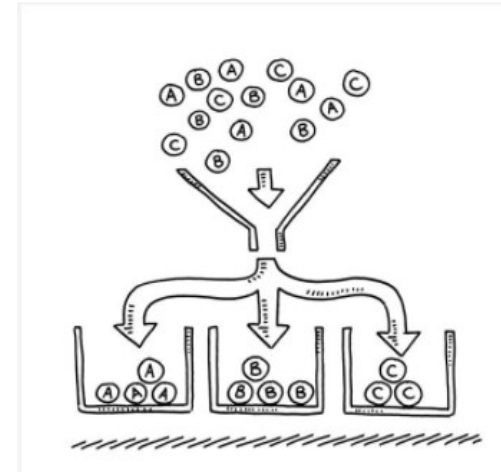
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About Today



About Today



Recommended
Shortlist → 15 PMs

Flooding and Erosion			
Culture and Heritage			
Fish and Wildlife			
Issues	#	Performance Measures	Details
Reservoir fish habitat	13	Average annual pelagic habitat	Location: Nechako Reservoir Timing: All Year Unit: Km2 Direction: More is better MSIC: 20%
River water temperature and migrating salmon	18	a: # of days average daily temp exceeds 18C (at Finmore) b: # of days average daily temp exceeds 19C c: # of days average daily temp exceeds 20C	Location: Chinook: entire Nechako River Sockeye: below confluence with Stuart River Timing: Salmon migration period Jun 15 – Aug 29 Unit: Days Direction: Fewer is better MSIC: 20%
River water temperature and juvenile salmon	19	Maximum # of consecutive days average daily temp >18C	Location: Chinook: entire Nechako River Timing: Growing season, Jun 15 – Aug 30 Unit: Days Direction: Less is better MSIC: 20%
River Chinook spawning habitat	20	Average habitat based on flow curve	Location: Nechako River between Cheslatta Falls and Vanderhoof Timing: Aug 15 - Oct 15 Unit: m² Direction: More is better MSIC: 20%

About Today

Phase 1 Bookend Alternatives

	Altern 1	Altern 2	Altern 3	Altern 4	Altern 5	Altern 6	Altern 7	Reference (Unregulated Flows)
Primary Purpose	Status Quo To serve as a reference to explore the benefits and costs of making flow changes	Nechako River Aquatic Species & Ecosystems <i>Provide a more naturalized hydrograph ("freshet") to promote ecosystem functions that benefit a range of aquatic species</i>	Nechako River Sockeye <i>Lower STMP temperature targets (18°C or 19°C) for sockeye migration</i>	Murray-Cheslatta Aquatic Species & Ecosystems <i>Provide a more naturalized hydrograph (i.e., reduce flow variability, especially through STMP) to promote ecosystem functions that benefit a range of aquatic species.</i>	Reservoir Wildlife <i>Minimize flooding of bird nests.</i>	Reservoir Aquatic Species & Ecosystems <i>Maximize reservoir productivity</i>	Murray-Cheslatta & Nechako River Flood Mitigation <i>Minimize flooding of Cheslatta gravelsites. Minimize overland flooding at Vanderhoof</i>	To better understand hydrology and the context of the current water control facilities
Base Flow Condition	Status Quo	status quo for smelter, tier 1 power sales, AWA, STMP, SLS min flow, and physical infrastructure (i.e., max/min reservoir elevations). All other constraints can be altered (flooding, tier 2 power sales, ice jam, beavers etc.)						Ecofish naturalized flow hydrograph

3 Bookend Alterns

	Altern 1	Altern 2	Altern 3
Primary Purpose	Status Quo To serve as a reference to explore the benefits and costs of making flow changes	Nechako River Aquatic Species & Ecosystems <i>Provide a more naturalized hydrograph ("freshet") to promote ecosystem functions that benefit a range of aquatic species</i>	Nechako River Sockeye <i>Lower STMP temperature targets (18°C or 19°C) for sockeye migration</i>

About Today



Partial Assessment

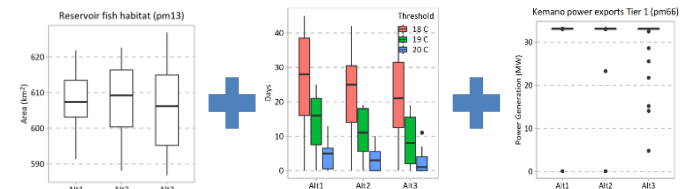
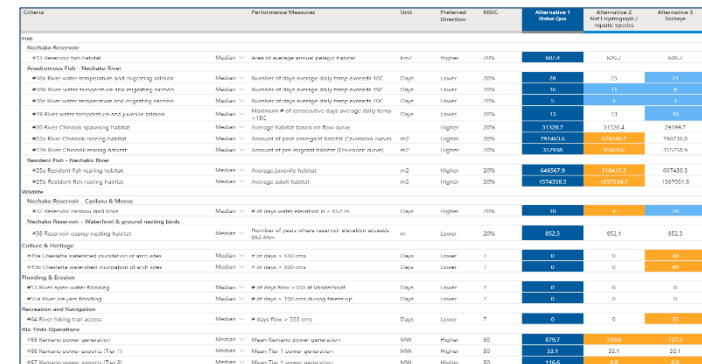
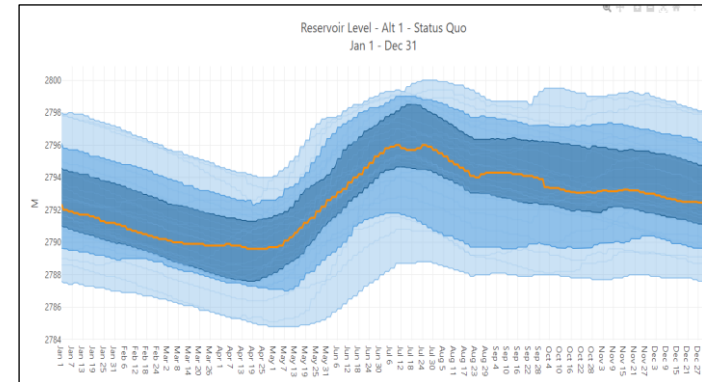


Criteria	Performance Measure	Unit	Preferred Direction	MEIC	Alternative 1 Status Quo	Alternative 2 Full Treatment / Aquatic Species	Alternative 3 Storage
Fish							
Resident Fish - Nechako River							
A13 Spawning fish habitat	Median - Area of average annual deltaic habitat	km ²	Higher	10%	607.4	609.2	606.0
Anadromous Fish - Nechako River							
A13a River water temperature and migrating salmon	Median - Number of days average daily temp exceeds 15C	Days	Lower	20%	20	20	21
A13b Flow water temperature and migrating salmon	Median - Number of days average daily temp exceeds 15C	Days	Lower	10%	16	11	8
A13c River water temperature and migrating salmon	Median - Number of days average daily temp exceeds 15C	Days	Lower	20%	3	2	1
A13d River water temperature and juvenile salmon	Median - Maximum # of juvenile daily average daily temp > 15C	Days	Lower	10%	13	10	16
A13e River Chinook spawning habitat	Median - Amount of power/water habitat (downstream)	km ²	Higher	20%	3128.7	3125.4	2955.7
A13f River Chinook spawning habitat	Median - Amount of power/water habitat (downstream)	km ²	Higher	20%	79162.6	62600.7	19676.8
A13g River Chinook spawning habitat	Median - Amount of power/water habitat (downstream)	km ²	Higher	20%	167958	166936	166768.8
Resident Fish - Nechako River							
A13a Resident fish spawning habitat	Median - Average juvenile habitat	km ²	Higher	20%	64607.9	31047.2	68740.3
A13b Resident fish spawning habitat	Median - Average adult habitat	km ²	Higher	20%	111425.3	121754.7	136751.9
Wildlife							
Nechako Reservoir - Caribou & Moose							
A13d Tawny owl caribou herd	Median - # of days water elevation is > 624 m	Days	Higher	10%	10	1	36
Nechako Reservoir - Waterfowl & ground nesting birds							
A13e Reservoir riparian nesting habitat	Median - Number of years where reservoir elevation exceeds 650.0m	m	Lower	20%	852.3	852.1	852.3
Culivik & Neeligan							
A13f Chishtiata watershed inundation of arch sites	Median - # of days > 150 cms	Days	Lower	7	0	0	46
A13g Chishtiata watershed inundation of arch sites	Median - # of days > 150 cms	Days	Lower	7	0	0	46
Reservoir & Reservoir							
A13h River open water flooding	Median - # of days > 150 cm at Vanderhoof	Days	Lower	7	0	0	0
A13i River ice jam flooding	Median - # of days > 150 cms during freeze up	Days	Lower	7	0	0	0
Recreation and Navigation							
A13j River boating trail access	Median - # days flow > 155 cms	Days	Lower	7	0	0	35
Rio Link Operations							
A13k Reservoir power generation	Median - Mean Reservoir power generation	MW	Higher	30	276.7	228.0	121.2
A13l Reservoir power generation (Tier 1)	Median - Mean Tier 1 power generation	MW	Higher	30	35.1	33.1	35.1
A13m Reservoir power generation (Tier 2)	Median - Mean Tier 2 power generation	MW	Higher	30	116.6	6.8	6.8

About Today



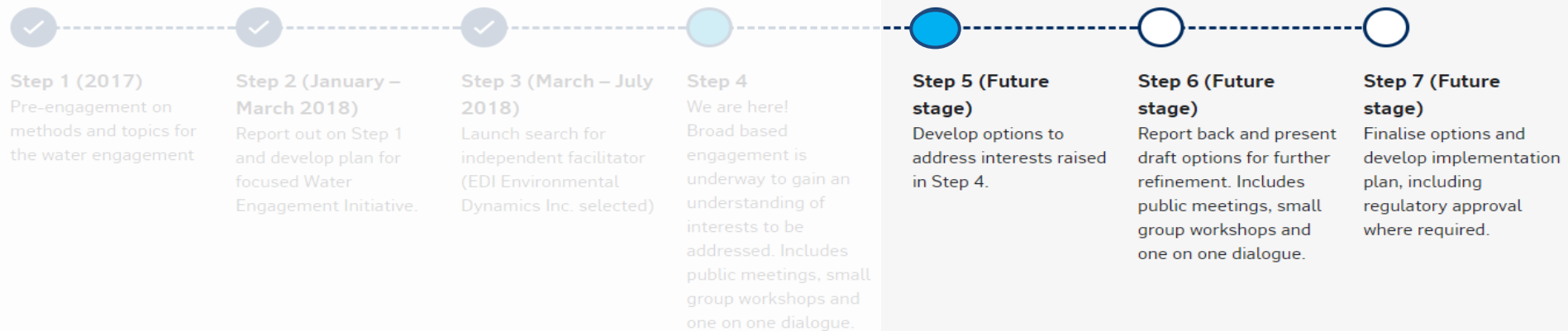
5 Evaluate Trade-Offs and Select



Questions?



Timeline



Issues to Performance Measures

Jayson Kurtz, Ecofish Research

Katie Healey, Ecofish

Phase 1 Bookend Alternatives

Michael Harstone

Jayson Kurtz

At our LAST WEI Meeting 27

Building Phase 1 Bookend Alternatives

- Discussed and agreed to a number of illustrative bookend alternatives to be developed and further developed by the TWG
- They were meant to be “illustrative” and provide a cross section of the nature and type of operating alternatives that could be developed
- THEY WERE designed as a basis to **LEARN** from and NOT as the basis to reach agreement on (*as they are not particularly multi-interest focused*)



At our LAST WEI Meeting 27

Phase 1 – Draft & Illustrative Bookend Flow Alternatives (developed through TWG)

	Altern 1	Altern 2	Altern 3	Altern 4	Altern 5	Altern 6	Altern 7	Reference (Unregulated Flows)
Primary Purpose	Status Quo To serve as a reference to explore the benefits and costs of making flow changes	Nechako River Aquatic Species & Ecosystems <i>Provide a more naturalized hydrograph ("freshet") to promote ecosystem functions that benefit a range of aquatic species</i>	Nechako River Sockeye <i>Lower STMP temperature targets (18°C or 19°C) for sockeye migration</i>	Murray-Cheslatta Aquatic Species & Ecosystems <i>Provide a more naturalized hydrograph (i.e., reduce flow variability, especially through STMP) to promote ecosystem functions that benefit a range of aquatic species.</i>	Reservoir Wildlife <i>Minimize flooding of bird nests.</i>	Reservoir Aquatic Species & Ecosystems <i>Maximize reservoir productivity</i>	Murray-Cheslatta & Nechako River Flood Mitigation <i>Minimize flooding of Cheslatta grovesites. Minimize overland flooding at Vanderhoof</i>	To better understand hydrology and the context of the current water control facilities
Base Flow Condition	Status Quo	status quo for smelter, tier 1 power sales, AVA, STMP, SLS min flow, and physical infrastructure (i.e., max/min reservoir elevations). All other constraints can be altered (flooding, tier 2 power sales, ice jam, beavers etc.)						<i>Ecofish naturalized flow hydrograph</i>
Operational Changes / Targets	None	The flow timing will follow the Ecofish naturalized flow hydrograph, scaled to the annual volume of water that is available (including additional volume from current tier 2 power sales). This will result in more flow May-July, will maintain flows in the STMP period, and possibly result in lower flow at other times of the year.	There are two options to achieve this: <ul style="list-style-type: none"> Maximize spillway release July 20 to Aug 20 (and see how cool we can reach) Target 18 and 19C by releasing known volume of water (based on Alec's temp/flow modeling) This will result in more flow during mid-July to mid-Aug, and less flow at other times of the year.	Ramping rates (how fast flow increases/decreases) would be applied to the STMP period. Maximum flow for individual STMP events will not change, but the events will start sooner and end later, resulting in more volume to reach the same temperature compared to status quo. To provide a more natural-shaped hydrograph, high flows will continue to be released on the decline of freshet, leading into the STMP. The flow reduction following the STMP will be more gradual. This will result in a longer freshet, similar magnitude but longer duration STMP flow pulses, and less flow at other times of the year.	Minimize reservoir level increases during bird breeding season (April 15 – Aug 15). There are two options to achieve this: <ul style="list-style-type: none"> Hold reservoir steady during bird breeding season (prevent nest flooding) Reach full pool prior to bird breeding season (prevent bird nesting) Assuming the latter, this will result in and higher flow during freshet and lower flow during the fall and winter.	Maximize reservoir elevation during the growing season (May – Sept) This will require filling the reservoir as fast as possible in the spring and will result in lower flow during the initial onset of freshet, until the reservoir is full. When the reservoir is full, flow will likely increase for the duration of freshet.	Hard constraint of 300cms maximum at Cheslatta falls This will require lower reservoir elevations during winter/spring, resulting in higher river flow during this period and lower flow during the freshet (i.e., more stable flow to Nechako River).	<i>Ecofish naturalized flow hydrograph.</i> <i>This scenario will route all water through Skins Lake Spillway (no discharge through Kemano) resulting in more water in the Nechako River year-round.</i>

Phase 1 Bookend Alternatives

Base Flow Conditions

(i.e., Aim was not to alter these parameters)

- Meet hydropower flows meet Smelter load and Tier 1 power sales
- Meet minimum AWA and STMP flow requirements
- Meet Skins Lake Spillway (SLS) min flows
- Physical constraints of system (e.g., max/min reservoir elevs)

Flexible Operating Parameters

(i.e., parameters that could be altered and/or re-prioritized in development of bookends)

- Re-allocating monthly AWA flow release schedule
- Hydropower flows for Tier 2 power sales
- Ramping rates at SLS
- Flood risk thresholds (e.g., Cheslatta Falls)
- Flow operations for beavers and avoiding ice jams



Phase 1 Bookend Alternatives

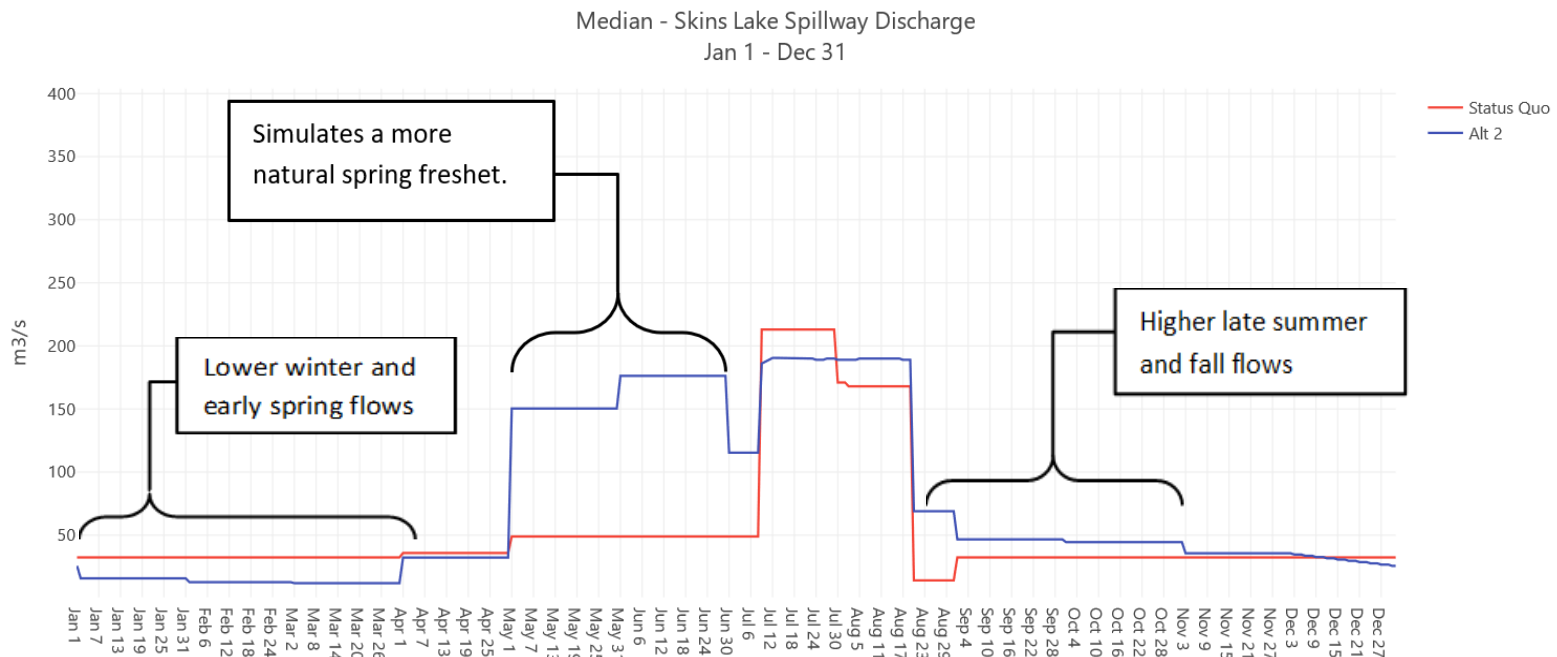
Alternative 1 – Status Quo

- This alternative is modeled to represent the current operations at Rio Tinto's water control facilities
- It incorporates water license and other flow related criteria that are currently used to manage the water through the facilities

Phase 1 Bookend Alternatives

Alternative 2 – Naturalized Hydrograph

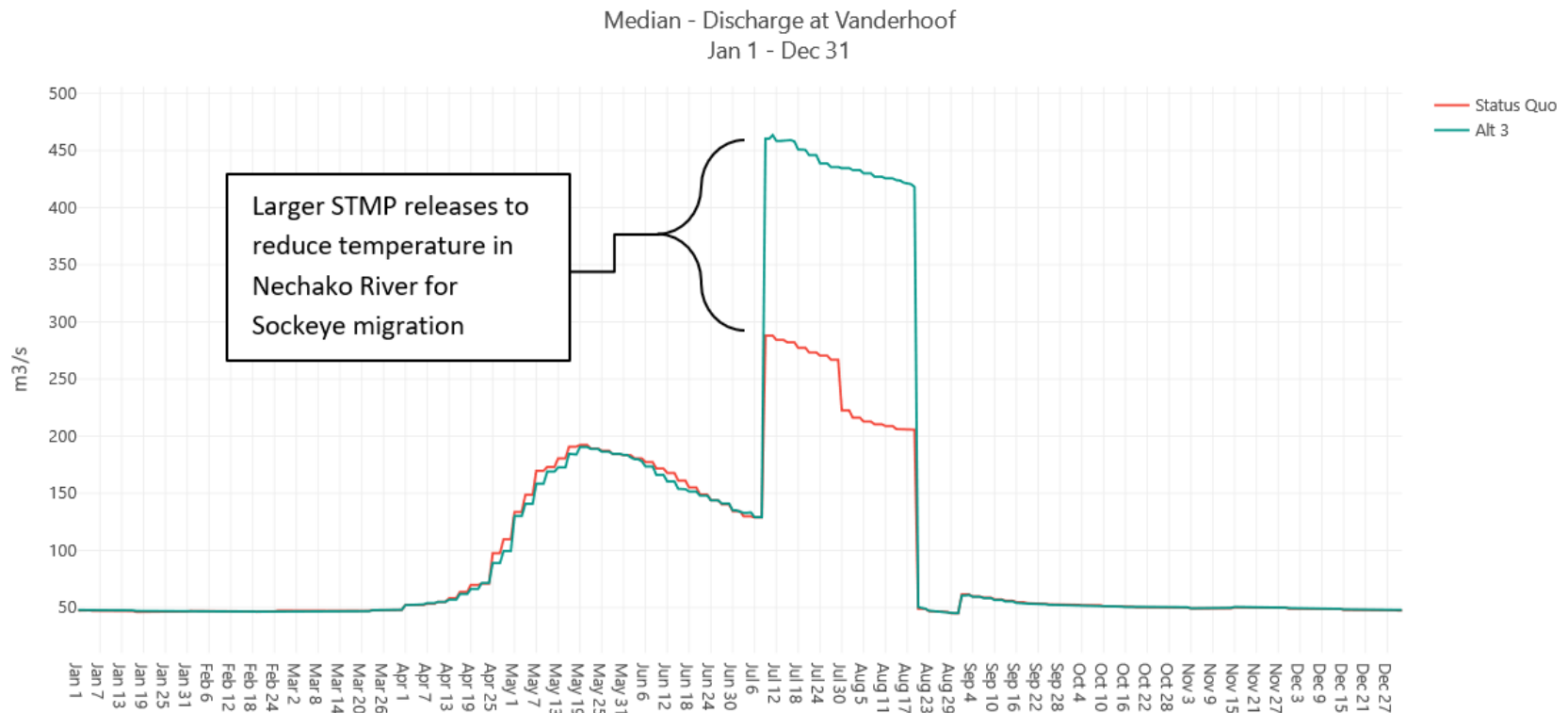
- Alt 2 is intended to benefit aquatic species and ecosystems in the Nechako River by providing a more naturalized hydrograph (i.e., shaped with a spring freshet)
- This alternative was created by scaling the BC Water Tool Nechako Reservoir watershed mean monthly discharge by 30% (to reflect the general flow allocation 30% Nechako, 70% Kemano) as a minimum SLS release.
- As a result, the Alt 2 hydrograph has moderately less flow during the early freshet but considerably more during mid freshet.



Phase 1 Bookend Alternatives

Alternative 3 – Salmon Migration (Temperature)

- Alt 3 is intended to benefit salmon migration success by reducing water temperature in the Nechako River below the current STMP target of 20C.
- This Alt was created by doubling the current STMP flows in July and Aug.

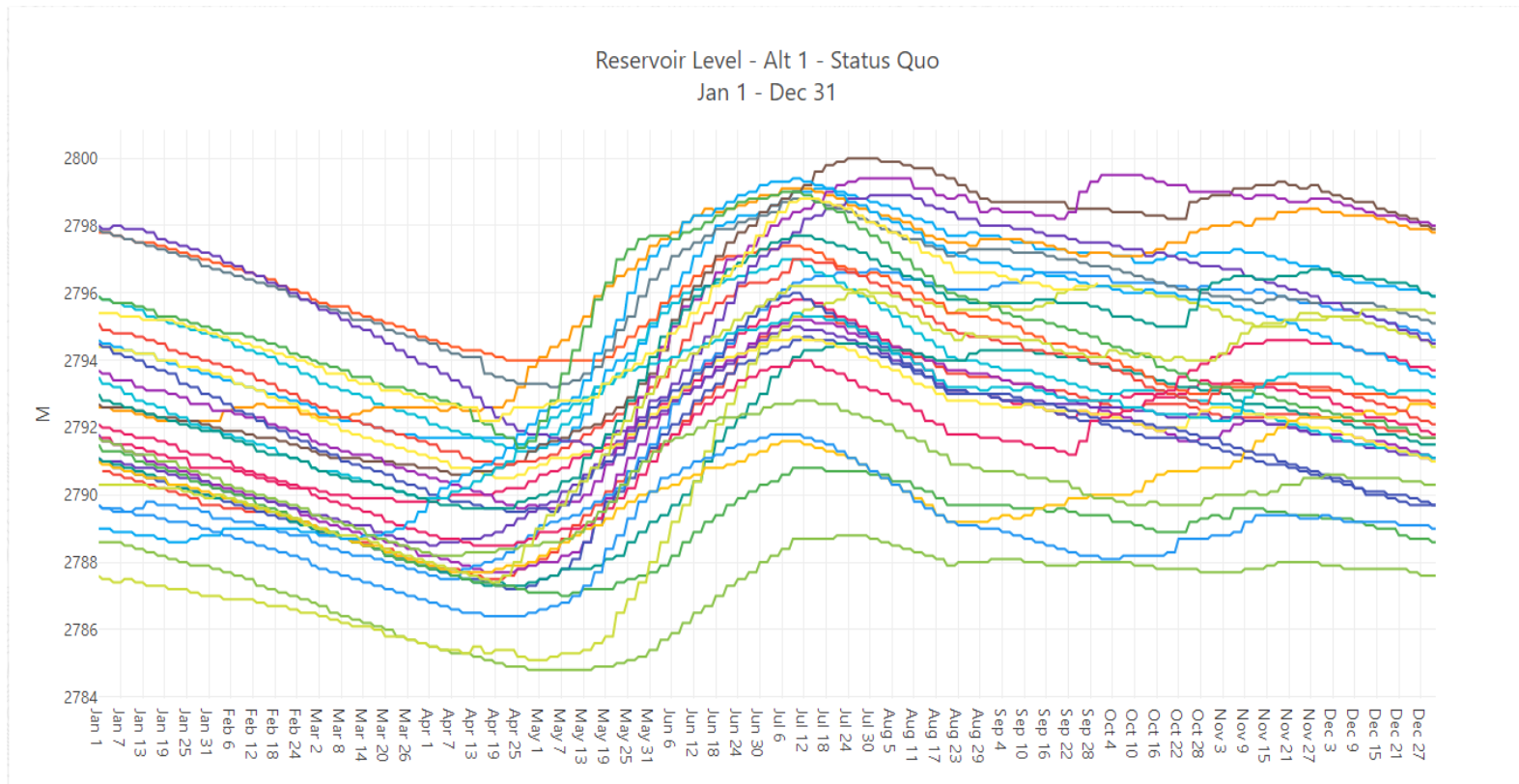


Assessing Bookend Alternatives

- Hydrology

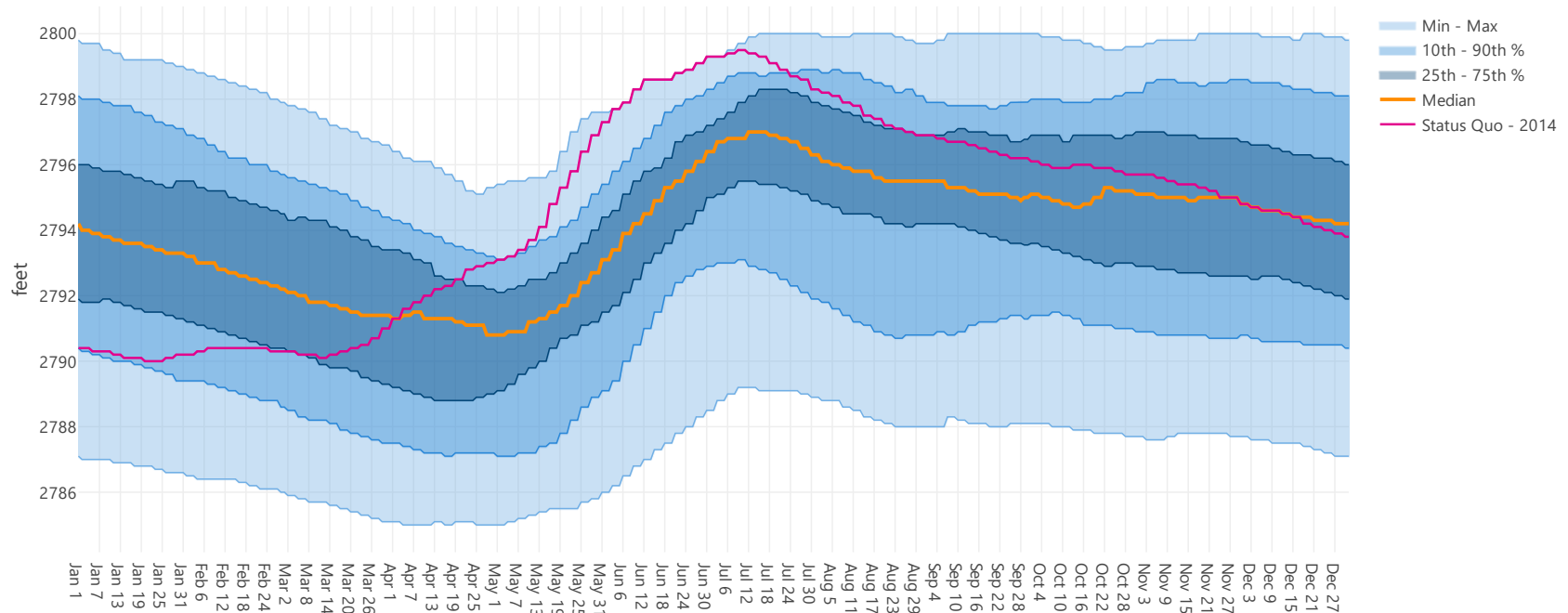
Michael Harstone
Clayton Schroeder

Modeling Outputs: Using Hydrographs



Modeling Outputs: Using Hydrographs

Reservoir Level - Status Quo
Jan 1, 2014 - Dec 31, 2014



	Maximum	Across the entire dataset, the maximum value recorded on a given day
	90 th percentile	90 % of all recorded values were below this point, and 10% were above. This represents a 1 in 10 year higher river flow / or higher reservoir level event
	75 th percentile	75 % of all recorded values were below this point, and 25% were above
	50 th percentile (median)	50% of records would be above, and 50% would be below this point. This represents an average'y' river flow or reservoir level where half the years would be expected to be above or below this point.
	25 th percentile	25 % of all recorded values were below this point, and 75% were above
	10 th percentile	10% of all recorded values were below this point, and 90% were above. This represents a 1 in 10 year lower river flow / or lower reservoir level event
	Minimum	Across the entire dataset, the minimum value recorded on a given day
	Selected Year	Represents a single year from the selected dataset

HydroViz – Online Tool

<https://www.hydroviz.ca/nechako>

Access Code: NECHAKOWEI

Chart Builder

Performance Measures

New Spaghetti Chart

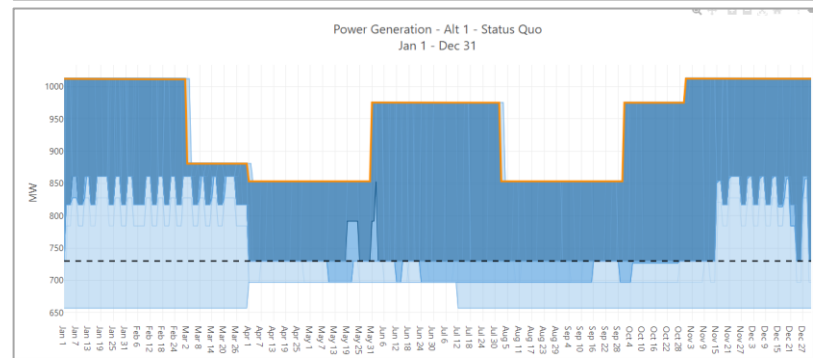
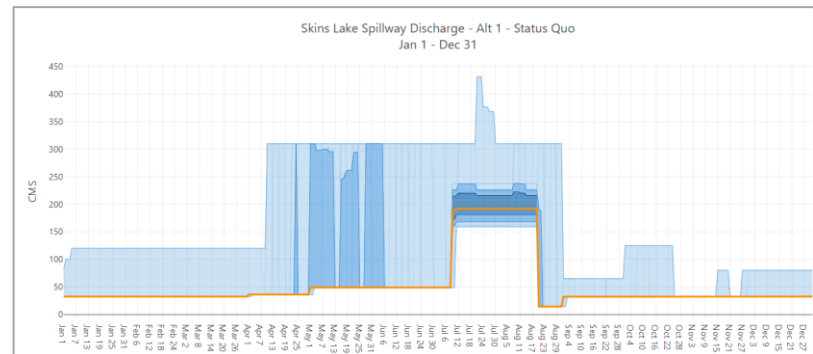
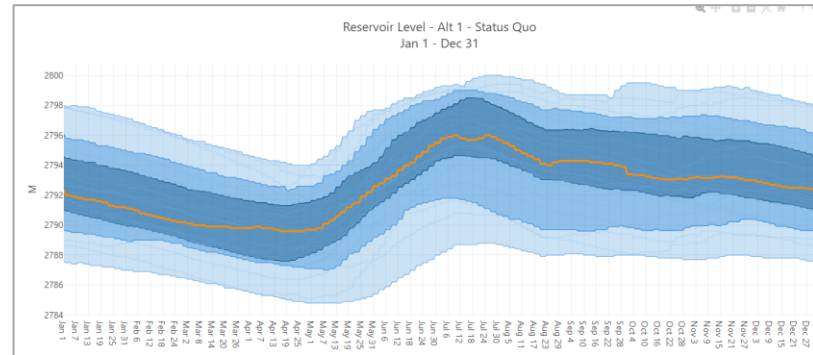
New Multiple Alternative Chart

New Single Alternative Chart

New Multiple Location Chart

New Period of Record Chart

New Historical Record Chart



HydroViz – Online Tool

<https://www.hydroviz.ca/nechako>

Access Code: NECHAKOWEI

Chart Builder

Performance Measures

New Spaghetti Chart

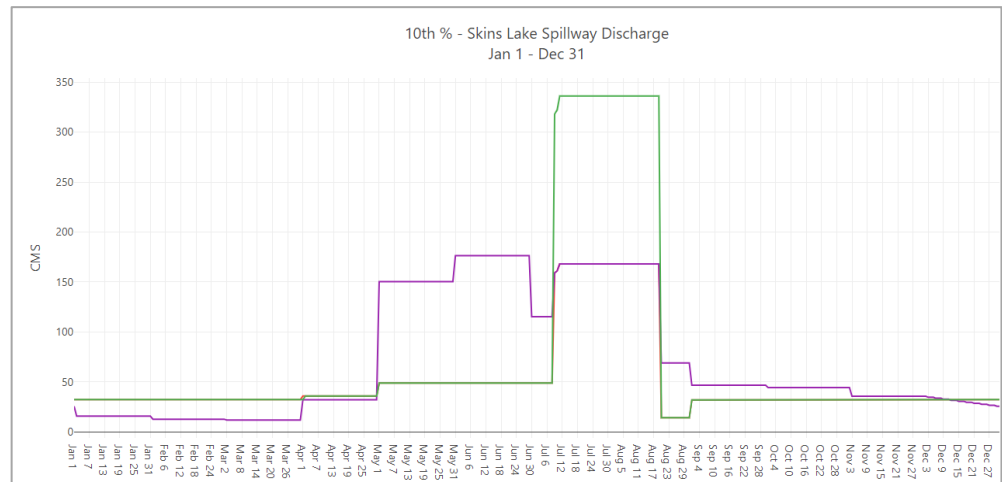
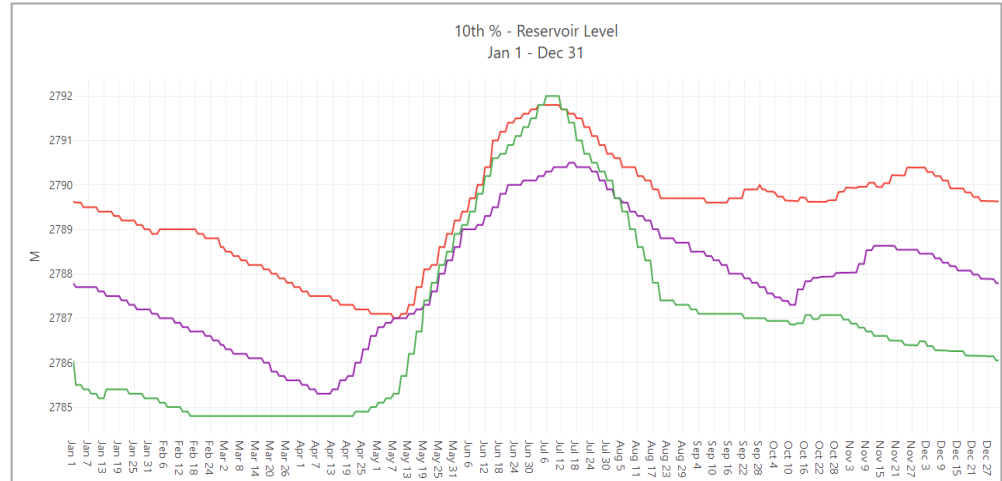
New Multiple Alternative Chart

New Single Alternative Chart

New Multiple Location Chart

New Period of Record Chart

New Historical Record Chart



HydroViz – Online Tool

<https://www.hydroviz.ca/nechako>

Access Code: NECHAKOWEI

Assessing Bookend Alternatives

- Shortlisted Performance Measures

Katie Healey

Jayson Kurtz

Cutting to the Chase ...



Criteria	Performance Measures		Unit	Preferred Direction	MSIC	Alternative 1 Status Quo	Alternative 2 Nat'l Hydrograph / Aquatic Species	Alternative 3 Sockeye
Fish								
Nechako Reservoir								
#13 Reservoir fish habitat	Median ▾	Area of average annual pelagic habitat	km2	Higher	20%	607.4	609.2	606.2
Anadromous Fish - Nechako River								
#18a River water temperature and migrating salmon	Median ▾	Number of days average daily temp exceeds 18C	Days	Lower	20%	28	25	21
#18b River water temperature and migrating salmon	Median ▾	Number of days average daily temp exceeds 19C	Days	Lower	20%	16	11	8
#18c River water temperature and migrating salmon	Median ▾	Number of days average daily temp exceeds 20C	Days	Lower	20%	5	3	1
#19 River water temperature and juvenile salmon	Median ▾	Maximum # of consecutive days average daily temp >18C	Days	Lower	20%	13	13	10
#20 River Chinook spawning habitat	Median ▾	Average habitat based on flow curve		Higher	20%	31328.7	31526.4	29199.7
#22a River Chinook rearing habitat	Median ▾	Amount of post-emergent habitat (Envirocon curve)	m2	Higher	20%	791463.6	629240.7	796736.8
#22b River Chinook rearing habitat	Median ▾	Amount of pre-migrant habitat (Envirocon curve)	m2	Higher	20%	357938	95059.6	355758.9
Resident Fish - Nechako River								
#25a Resident fish rearing habitat	Median ▾	Average juvenile habitat	m2	Higher	20%	646567.9	310417.2	607430.3
#25b Resident fish rearing habitat	Median ▾	Average adult habitat	m2	Higher	20%	1574358.5	1257534.7	1367051.8
Wildlife								
Nechako Reservoir - Caribou & Moose								
#32 Reservoir caribou land links	Median ▾	# of days water elevation is > 852 m	Days	Higher	20%	10	4	20
Nechako Reservoir - Waterfowl & ground nesting birds								
#38 Reservoir osprey nesting habitat	Median ▾	Number of years where reservoir elevation exceeds 852.44m	m	Lower	20%	852.3	852.1	852.3
Culture & Heritage								
#49a Cheslatta watershed inundation of arch sites	Median ▾	# of days > 330 cms	Days	Lower	7	0	0	40
#49b Cheslatta watershed inundation of arch sites	Median ▾	# of days > 300 cms	Days	Lower	7	0	0	40
Flooding & Erosion								
#53 River open-water flooding	Median ▾	# of days flow >550 at Vanderhoof	Days	Lower	7	0	0	0
#55a River ice-jam flooding	Median ▾	# of days > 100 cms during freeze up	Days	Lower	7	0	0	0
Recreation and Navigation								
#64 River hiking trail access	Median ▾	# days flow > 355 cms	Days	Lower	7	0	0	35
Rio Tinto Operations								
#65 Kemano power generation	Median ▾	Mean Kemano power generation	MW	Higher	50	879.7	739.8	737.3
#66 Kemano power exports (Tier 1)	Median ▾	Mean Tier 1 power generation	MW	Higher	50	33.1	33.1	33.1
#67 Kemano power exports (Tier 2)	Median ▾	Mean Tier 1 power generation	MW	Higher	50	116.6	6.8	6.8

Phase 1 Bookend Alternatives

Performance Measures

- *Katie and Jayson ...*

Assessing Alternatives

- Consequence Table (PMs Summary)

Table 1: Summary of Environmental and Socio-Economic Indicators for the Nechako River Watershed								
Criteria	Performance Measures		Unit	Preferred Direction	MSIC	Alternative 1 Status Quo	Alternative 2 Nat'l Hydroelectric Species	Alternative 3 Sockeye
Fish								
Nechako Reservoir								
#13 Reservoir fish habitat	Median	Area of average annual pelagic habitat	km2	Higher	20%	607.4	609.2	606.2
Anadromous Fish - Nechako River								
#18a River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 18C	Days	Lower	20%	28	25	21
#18b River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 19C	Days	Lower	20%	16	11	8
#18c River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 20C	Days	Lower	20%	5	3	1
#19 River water temperature and juvenile salmon	Median	Maximum # of consecutive days average daily temp >18C	Days	Lower	20%	13	13	10
#20 River Chinook spawning habitat	Median	Average habitat based on flow curve		Higher	20%	31,328.7	31,526.4	29,199.7
#22a River Chinook rearing habitat	Median	Amount of post-emergent habitat (Envirocon curve)	m2	Higher	20%	791,463.6	629,240.7	796,736.8
#22b River Chinook rearing habitat	Median	Amount of pre-migrant habitat (Envirocon curve)	m2	Higher	20%	357,938	95,059.6	355,758.9
Resident Fish - Nechako River								
#25a Resident fish rearing habitat	Median	Average juvenile habitat	m2	Higher	20%	646,567.9	310,417.2	607,430.3
#25b Resident fish rearing habitat	Median	Average adult habitat	m2	Higher	20%	1,574,358.5	1,257,534.7	1,367,051.8
Wildlife								
Nechako Reservoir - Caribou & Moose								
#32 Reservoir caribou land links	Median	# of days water elevation is > 852 m	Days	Higher	20%	10	4	20
Nechako Reservoir - Waterfowl & ground nesting birds								
#38 Reservoir osprey nesting habitat	Median	Number of years where reservoir elevation exceeds 852.44m	m	Lower	20%	852.3	852.1	852.3
Culture & Heritage								
#49a Cheslatta watershed inundation of arch sites	Median	# of days > 330 cms	Days	Lower	7	0	0	40
#49b Cheslatta watershed inundation of arch sites	Median	# of days > 300 cms	Days	Lower	7	0	0	40
Flooding & Erosion								
#53 River open-water flooding	Median	# of days flow >550 at Vanderhoof	Days	Lower	7	0	0	0
#55a River ice-jam flooding	Median	# of days > 100 cms during freeze up	Days	Lower	7	0	0	0
Recreation and Navigation								
#64 River hiking trail access	Median	# days flow > 355 cms	Days	Lower	7	0	0	35
Rio Tinto Operations								
#65 Kemano power generation	Median	Mean Kemano power generation	MW	Higher	50	879.7	739.8	737.3
#66 Kemano power exports (Tier 1)	Median	Mean Tier 1 power generation	MW	Higher	50	33.1	33.1	33.1
#67 Kemano power exports (Tier 2)	Median	Mean Tier 1 power generation	MW	Higher	50	116.6	6.8	6.8

Criteria		Performance Measures	Unit	Preferred Direction	MSIC	Alternative 1 Status Quo	Alternative 2 Nat'l Hydrograph / Aquatic Species	Alternative 3 Sockeye
Fish								
Nechako Reservoir								
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#18b River water temperature and migrating salmon	Median ▾	Number of days average daily temp exceeds 19C	Days	Lower	20%	16	11	8
#18c River water temperature and migrating salmon	Median ▾	Number of days average daily temp exceeds 20C	Days	Lower	20%	5	3	1
#19 River water temperature and juvenile salmon	Median ▾	Maximum # of consecutive days average daily temp >18C	Days	Lower	20%	13	13	10
#20 River Chinook spawning habitat	Median ▾	Average habitat based on flow curve		Higher	20%	31328.7	31526.4	29199.7
#22a River Chinook rearing habitat	Median ▾	Amount of post-emergent habitat (Envirocon curve)	m2	Higher	20%	791463.6	629240.7	796736.8
#22b River Chinook rearing habitat	Median ▾	Amount of pre-migrant habitat (Envirocon curve)	m2	Higher	20%	357938	95059.6	355758.9
Resident Fish - Nechako River								
#25a Resident fish rearing habitat	Median ▾	Average juvenile habitat	m2	Higher	20%	646567.9	310417.2	607430.3
#25b Resident fish rearing habitat	Median ▾	Average adult habitat	m2	Higher	20%	1574358.5	1257534.7	1367051.8
Wildlife								
Nechako Reservoir - Caribou & Moose								
#32 Reservoir caribou land links	Median ▾	# of days water elevation is > 852 m	Days	Higher	20%	10	4	20
Nechako Reservoir - Waterfowl & ground nesting birds								
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Assessing Alternatives

- Mock Ranking Exercise

Michael & Clayton

Phase 1 Bookend Alternatives

Mock Ranking Exercise

Purpose:

- To provide an example of the tools we will be using to gauge the Main Tables preferences and priorities
- To begin to discuss our collective values through the lens of 3 illustrative bookend alternatives
- To demonstrate how we will use your values and priorities to build improved alternatives in the process

Phase 1 Bookend Alternatives

Mock Ranking Exercise

- There are a variety of ranking tools that we may use during the evaluation process of flow alternatives
- Today, we are ONLY going to use one to demonstrate

Direct Ranking – is an intuitive technique where you will be asked to indicate which alternatives are your ‘most preferred’ and ‘least preferred’, the steps are:

STEP 1: Rank each alternative from #1 (best or ‘most preferred’) to #3 (worst or “least preferred”) according to how well the alternatives are meeting your interests

STEP 2: Distribute 100 points to your #1 (most preferred) alternative

STEP 3: Distribute a lesser amount of points to your next ‘most preferred’ alternative according to how well it meets your needs

Phase 1 Bookend Alternatives

Mock Ranking Exercise

- Your rankings and weightings can be anonymous or NOT for this mock exercise ... *it is up to you?*
- But we will be inviting people to share their thoughts for why they may have ranked one alternative above another when we get to the results ...
- *And by all means, have fun with this exercise*



Phase 1 Bookend Alternatives

Mock Ranking Exercise

- Clayton...

Next Steps