# Water Engagement Initiative
# Main Table Meeting 32

Wednesday, November 8, 9:00 am to 5:00 pm

Vanderhoof Community Event Centre

# Meeting Objectives

- To provide an update since our last meeting,
- To review and assess the performance of the next round Phase 1 Flow Alternatives,
- To discuss and reach agreement on a Package of Phase 1 Recommendations related to a
  - (i) Preferred Flow Alternative,
  - (ii) Datagaps (PMs, baseline ecological studies) to be carried out in Phase 1,
  - (iii) Physical works projects to be built in Phase 1, and
  - (iv) Other operational considerations for Phase 1.
- To discuss our upcoming workplan and schedule for the remainder of 2023 and the transitioning into Phase 2 in 2024.

# Draft Agenda

| | |
|---|---|
| 9:00 am | Welcome and Update |
| 9:45am | Phase 1 Flow Alternatives |
| 11:00am | Break |
| 11:15am | Selecting a Preferred Flow Alternative |
| 12:15pm | Lunch |
| 1:00pm | Building a Package of Phase 1 Recommendations |
| 2:00pm | Phase 1 Datagaps |
| 3:00pm | Break |
| 3:15pm | Phase 1 Physical Works |
| 4:30pm | Other Phase 1 Considerations |
| 4:45pm | Next Steps |
| 5:00pm | Adjourn |

# WEI Approved Meeting Ground Rules

1. Be respectful
2. Listen actively and be attentive
3. Try to understand other participant's perspectives, even if you disagree with them
4. Be collaborative
5. Focus on the future
6. Stay on topic and be concise
7. Give others a chance to speak (some participants may be shy—but have valuable things to say)
8. Turn off your electronics (use breaks to respond to emails or make phone calls)
9. Speak about your interests
10. Respect the facilitator's requests

# Main Table Meeting 31 summary

- Final meeting summary available at:

  https://www.getinvolvednechako.ca/wp-content/uploads/2023/07/WEI_Main_Table_Meeting_31_Summary.pdf

# Meeting 31 Action Items

**Action items:**

- Carry out a more detailed assessment of **Tier 2 Power Generation losses** associated with the conditionally supported Altern 5D (and also 4D)
- **2015 Flooding Model Assessment** – to better ground-truth the model, run it using the historical inflows from 2015 set at the actual reservoir levels at the beginning of the water year
- Project Team to work on and help develop a **Package of Phase 1 Recommendations** for the next mtg

# Update: Southside Working Group

- No update to report on

# Rio Tinto Update and Operations

# TWG Update

# TWG Update

- 3 meetings since last MT meeting
- Flow modeling and monitoring
- NFN TWG
    - cross=participation

# About Today

# Nechako WEI Process Steps

**Timeline**

**Step 1 (2017)**
Pre-engagement on methods and topics for the water engagement

**Step 2 (January – March 2018)**
Report out on Step 1 and develop plan for focused Water Engagement Initiative.

**Step 3 (March – July 2018)**
Launch search for independent facilitator (EDI Environmental Dynamics Inc. selected)

**Step 4**
Broad based engagement is underway to gain an understanding of interests to be addressed. Includes public meetings, small group workshops and one on one dialogue.

**Step 5 (Future stage)**
Develop options to address interests raised in Step 4.

**Step 6 (Future stage)**
Report back and present draft options for further refinement. Includes public meetings, small group workshops and one on one dialogue.

**Step 7 (Future stage)**
Finalise options and develop implementation plan, including regulatory approval where required.

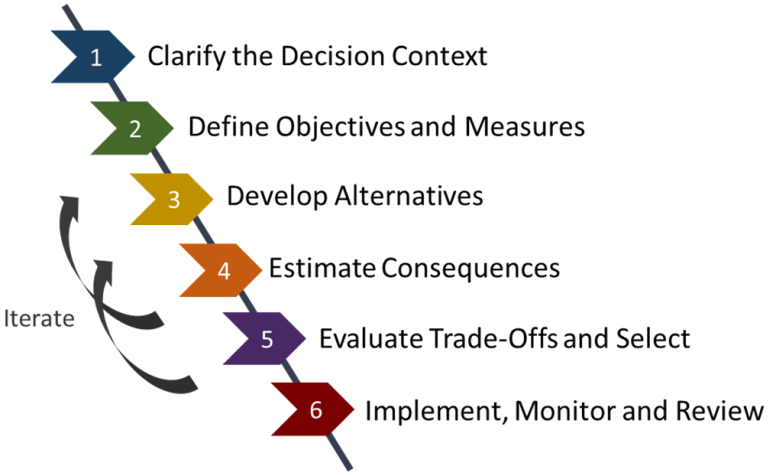
# Assessment Process of Flow Alternatives – in a Snapshot

## Purpose

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

## Schedule

- Phase 1 - Multiple Main Table Meetings over the next 12 months or so
- Phase 1 - Meetings every ~12 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

# Refresher from past meetings

**Main Table is currently In Phase 1**

Phase 1
(Immediate Term)

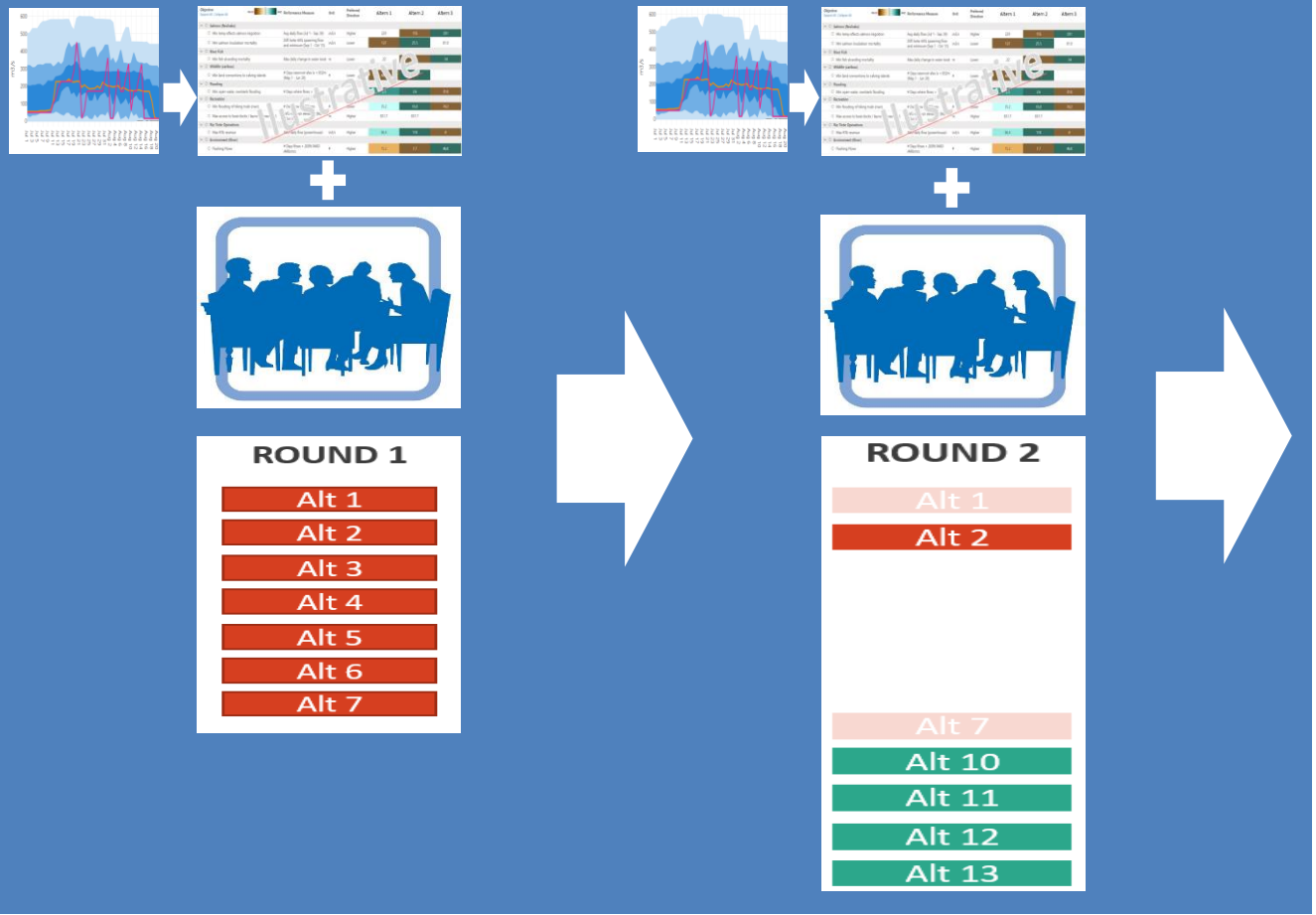
Flow alternatives that Rio Tinto could unilaterally make within the immediate term (e.g., next calendar year) with notification to regulators, First Nations and stakeholders with time to undertake any internal assessments that may need to be carried out.

Proposed changes would aim to be within the current water budget for Nechako River.

[**Note.** Phase 1 alterns also explore the benefits and trade-offs of using Tier 2 hydropower water to increase flows to the Nechako River at times].

# Refresher from past meetings

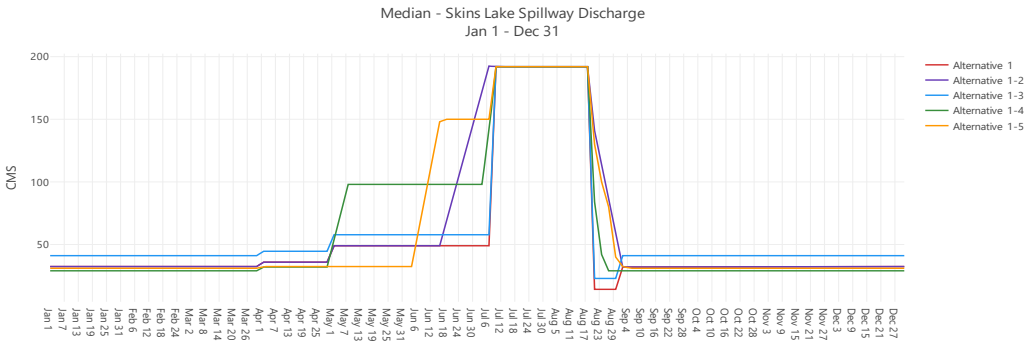
## SDM Process Steps:


# Working Towards the End of Phase 1

## Phase 1 Flow Alternatives

**Phase 1**
(Immediate Term)



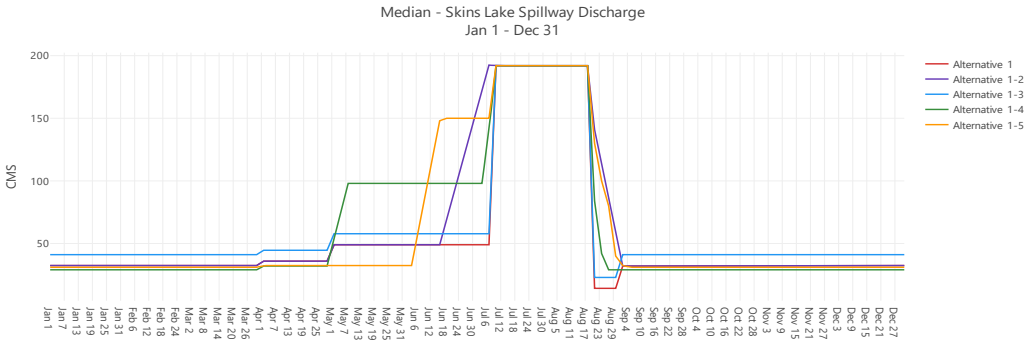

A key question for the Main Table as they consider making a recommendation on a Phase 1 Flow Alternative,

*"Whether one of the Flow Alternatives is better than Rio Tinto's current operations (i.e., Alternative 1 – Status Quo) and should it be implemented in the short term (i.e., Phase 1) or should changes wait until Phase 2 or Phase 3 when there are more significant benefits?"*

# Working Towards the End of Phase 1

## Phase 1 Flow Alternatives

Phase 1
(Immediate Term)




## A "Package" of Phase 1 Flow Related Recommendations

| Phase 1 Flow Alternatives | Phase 1 PM Datagaps (for P2&P3) | Phase 1 Ecol. Baseline Datagaps | Phase 1 Physical Works | Phase 1 Effects Monitoring | Phase 1 Review Period | Phase 1 Triggers |
|---|---|---|---|---|---|---|
| **Alt 1** Status Quo | none | none | none | none | none | none |
| **Alt 4D** EWRS_WYF (11/30) | | River Reed Canary Grass (#5) - fish stranding assment | Bank Erosion - project(s) | Reservoir Elevation | after 2 yrs | White Sturgeon Recovery |
| **Alt 5D** EWRS_WYF (11/30) | River Side Channel PM (#6) | River Fish (#6) - side channel habitat assmnt | Cheslatta Fish - project(s) | River Discharge | after 5 yrs | Unintended Popln Level Effects |
| ***New* Alt 4E** Hybrid 4D (8/30) | River Riparian Habitat PM (#7) | River Productivity (#9) - field surveys | Flooding - project(s) | River Elevation | etc. | etc. |
| ***New* Alt 5E** Hybrid 5D (8/30) | | Reservoir Productivity (#12) - Limnology surveys | Osprey & Cormorants - project(s) | River Temperature | | |
| ***New* Alt 6A** Hybrid 4E - Wet Yr Freshet Pulse | Reservoir Fish Habitat PM (#14) | Reservoir Fish Habitat (#14) - benthos & popln distri | Reservoir Fish - project(s) | Power Output | | |
| | Cheslatta Fish PM (#17) | Cheslatta Fish Habitat (#17) - Baseline Distr + Abundance | River Fish / Salmon - project(s) | | | |
| | Salmon Temp-Migration PM (#18) | River Temp & Migration (#18) - Fish Habitat + Fate Assmnt | Sediment Transport - project(s) | | | |
| | Juvenile Survival PM (#19) | River Temp & Juveniles (#19) - Habitat Use + Fate Assmnt | Ungulates - project(s) | | | |
| | Chinook Rearing PM (#22) | Chinook Winter Habitat (#23) - Habitat Assmnt | Waterfowl/Shore Nesting Birds - project(s) | | | |
| | Resident Fish Rearing PM (same as PM #18) | Resident Fish Temp (#24) - Field & Temp Study | Wildlife Habitat - project(s) | | | |
| | | Resident Fish Rearing Habitat (#25) - Field & Habitat Study | | | | |
| | | River Mussels (#27) - field assmnt | | | | |
| | White Sturgeon PMs (#28, 29, 30) | White Sturgeon (#28, 29, 30) | | | | |
| | Archaeology Site Erosion PM (#49) | Reservoir Osprey Food Avail (#39) - fish popln distr, abund, hab use | | | | |
| | River Ice PM (#68) | River Ice Cover (#68) - field survey | | | | |

# Working Towards the End of Phase 1

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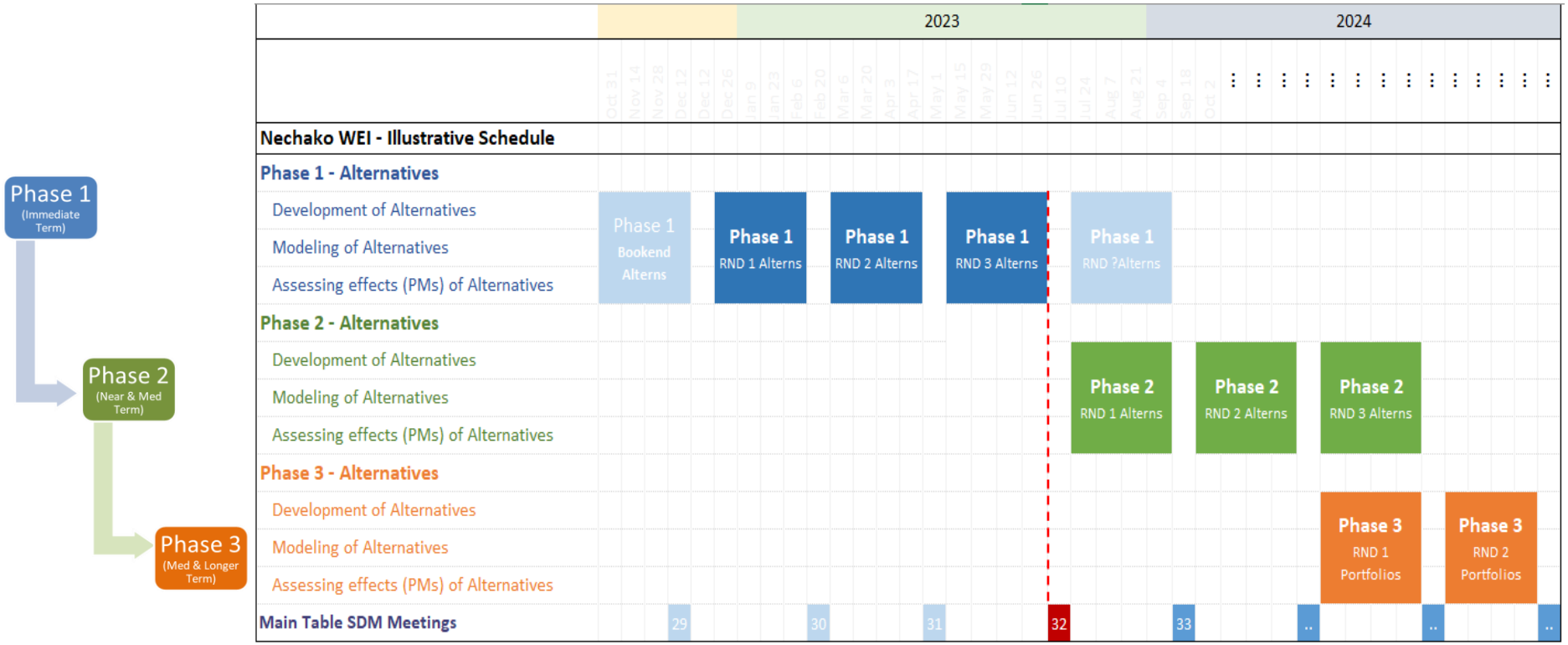
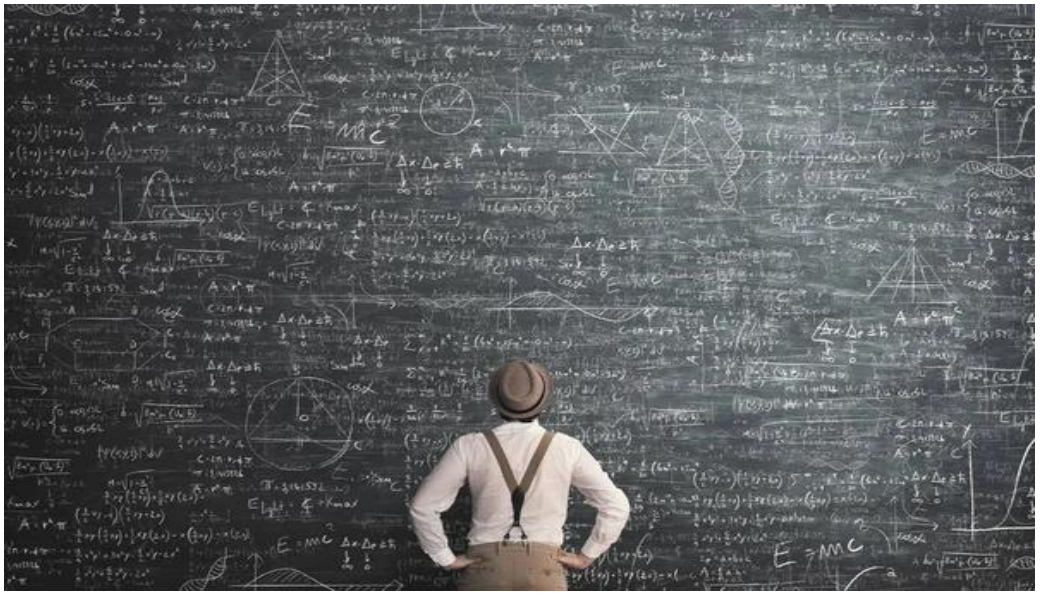
# Working Towards the End of Phase 1

## **Draft Workplan:** as previously discussed



# About Today


# About Today

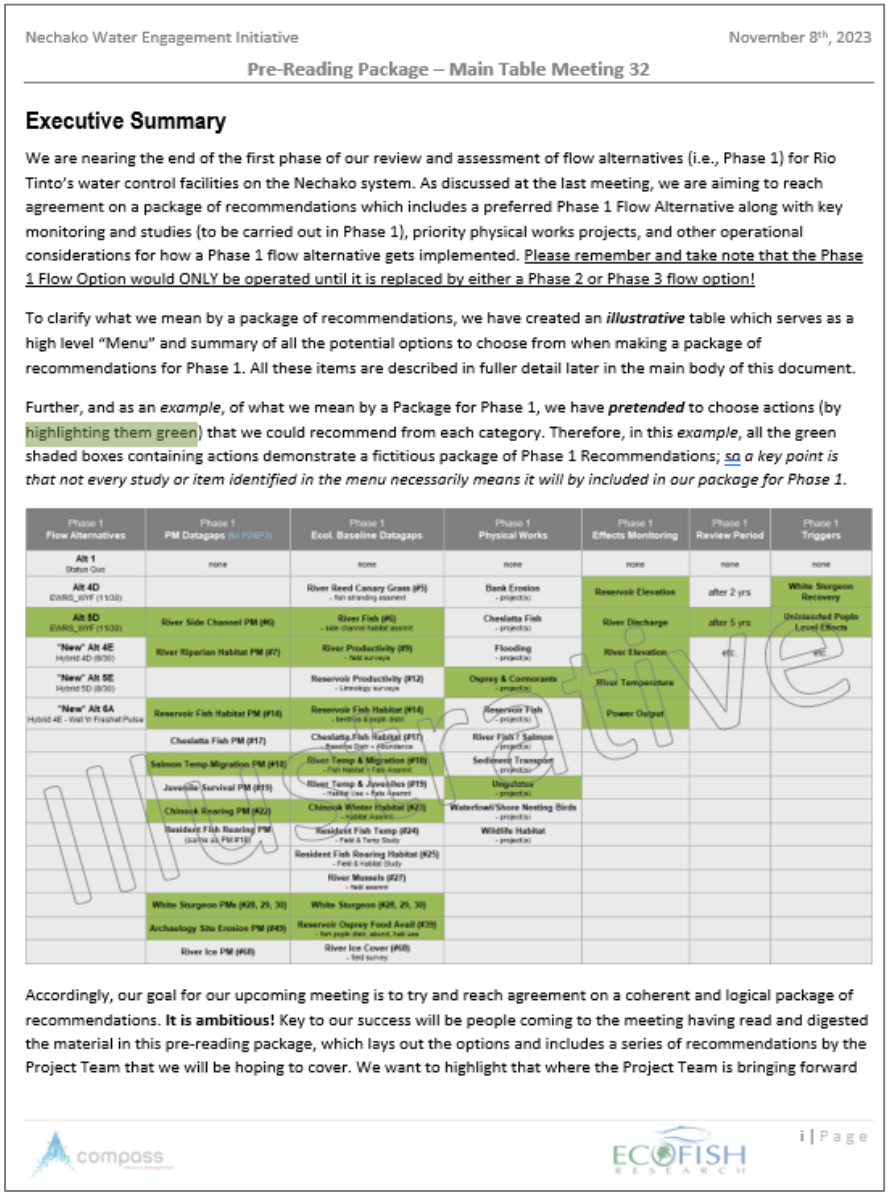
## Pre-Reading that was sent out ➔

### On-line webtools Training Session

**HydroViz** – Link here: https://www.hydroviz.ca/nechako

**AltaViz** – Link here: https://www.altaviz.ca/public/220db3fc-2aa8-4eea-9dd1-e3a26c4bb97a

Access Code (same for both): NECHAKOWEI



Nechako Water Engagement Initiative — November 8th, 2023

Pre-Reading Package – Main Table Meeting 32

**Executive Summary**

We are nearing the end of the first phase of our review and assessment of flow alternatives (i.e., Phase 1) for Rio Tinto's water control facilities on the Nechako system. As discussed at the last meeting, we are aiming to reach agreement on a package of recommendations which includes a preferred Phase 1 Flow Alternative along with key monitoring and studies (to be carried out in Phase 1), priority physical works projects, and other operational considerations for how a Phase 1 flow alternative gets implemented. Please remember and take note that the Phase 1 Flow Option would ONLY be operated until it is replaced by either a Phase 2 or Phase 3 flow option!

To clarify what we mean by a package of recommendations, we have created an ***illustrative*** table which serves as a high level "Menu" and summary of all the potential options to choose from when making a package of recommendations for Phase 1. All these items are described in fuller detail later in the main body of this document.

Further, and as an *example*, of what we mean by a Package for Phase 1, we have ***pretended*** to choose actions (by highlighting them green) that we could recommend from each category. Therefore, in this *example*, all the green shaded boxes containing actions demonstrate a fictitious package of Phase 1 Recommendations; *so a key point is that not every study or item identified in the menu necessarily means it will by included in our package for Phase 1.*

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Accordingly, our goal for our upcoming meeting is to try and reach agreement on a coherent and logical package of recommendations. **It is ambitious!** Key to our success will be people coming to the meeting having read and digested the material in this pre-reading package, which lays out the options and includes a series of recommendations by the Project Team that we will be hoping to cover. We want to highlight that where the Project Team is bringing forward

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# Questions?


## Timeline

**Step 1 (2017)**
Pre-engagement on methods and topics for the water engagement

**Step 2 (January – March 2018)**
Report out on Step 1 and develop plan for focused Water Engagement Initiative.

**Step 3 (March – July 2018)**
Launch search for independent facilitator (EDI Environmental Dynamics Inc. selected)

**Step 4**
We are here! Broad based engagement is underway to gain an understanding of interests to be addressed. Includes public meetings, small group workshops and one on one dialogue.

**Step 5 (Future stage)**
Develop options to address interests raised in Step 4.

**Step 6 (Future stage)**
Report back and present draft options for further refinement. Includes public meetings, small group workshops and one on one dialogue.

**Step 7 (Future stage)**
Finalise options and develop implementation plan, including regulatory approval where required.

# Action Item

Modeling 2015 Water Year with Actual Reservoir Levels

# Reservoir Operations in 2015

SDP Model output vs Actuals

**Comment from K. Moutray**

- In the model, there is no flooding at Vanderhoof in 2015, whereas in reality there was flooding. Does the model provide accurate results?

**Explanation**

- The model does not try to recreate past reservoir operations, but rather to manage historical inflows while applying current operational parameters (flood thresholds, minimum spills, 2nd tunnel, smelter load, etc.)

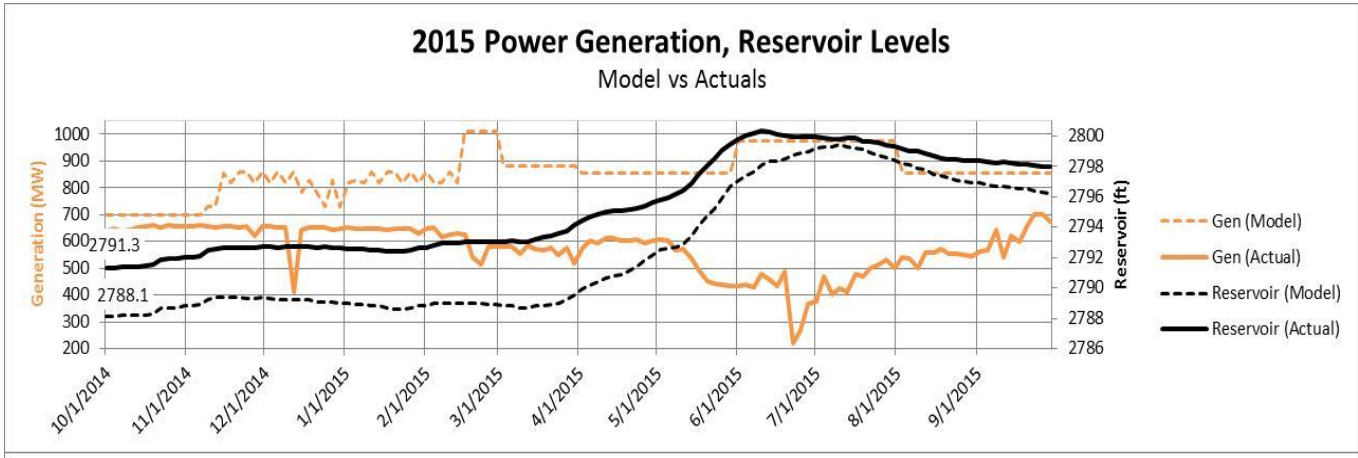
| Parameter | Historical Operation | Model |
|---|---|---|
| Inflows | Actuals | Actuals |
| Minimum spills | Implemented in the 1980s | Current minimums applied since 1957 |
| Flood thresholds | Became better known during 2007 flood | Current thresholds applied since 1957 |
| Kemano 2nd tunnel | Commissioned in 2022 | Available since 1957 |
| Smelter load | Typically 640 MW until KCP in 2015-2016<br>Operational incidents and fluctuations | Constant at 730 MW since 1957 |

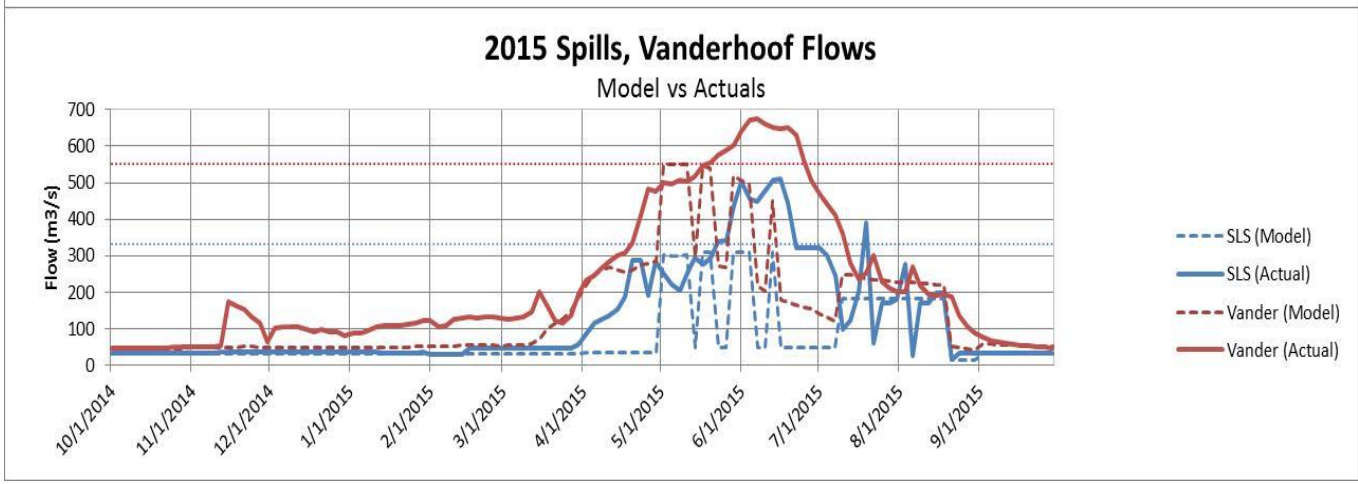
# Reservoir Operations in 2015

## SDP Model output vs Actuals

**Observations**

- Initial reservoir level in Oct. 2014 is 3 ft lower in the model (2788.1 ft vs 2791.3 ft)
- Actual power generation in 2014-2015 was limited by export capacity during transition to new smelter; this limitation is not reflected in the model
- Actual spillway releases we increased in February and further in April. In the model, because of the different context described above, spills start later and do not need to exceed 310 cms. The reservoir peaks at 2799.4 ft, vs 2800.3 ft (actual)



# Reservoir Operations in 2015

SDP Model output vs Actuals

## What if the model was run with the same initial reservoir level?

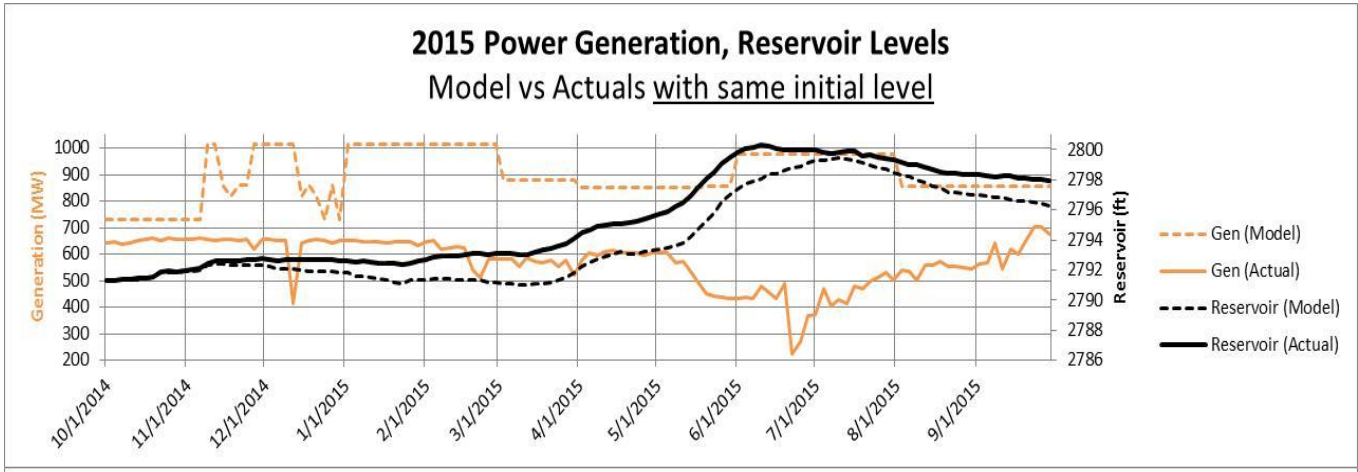
- A first scenario was run with the initial reservoir level set to the actual level in Oct. 2014 (2791.3 ft), and keeping all other model parameters unchanged, such as smelter load at 730 MW, and current capacity at Kemano
- A second scenario was also run with the actual limited power generation capacity

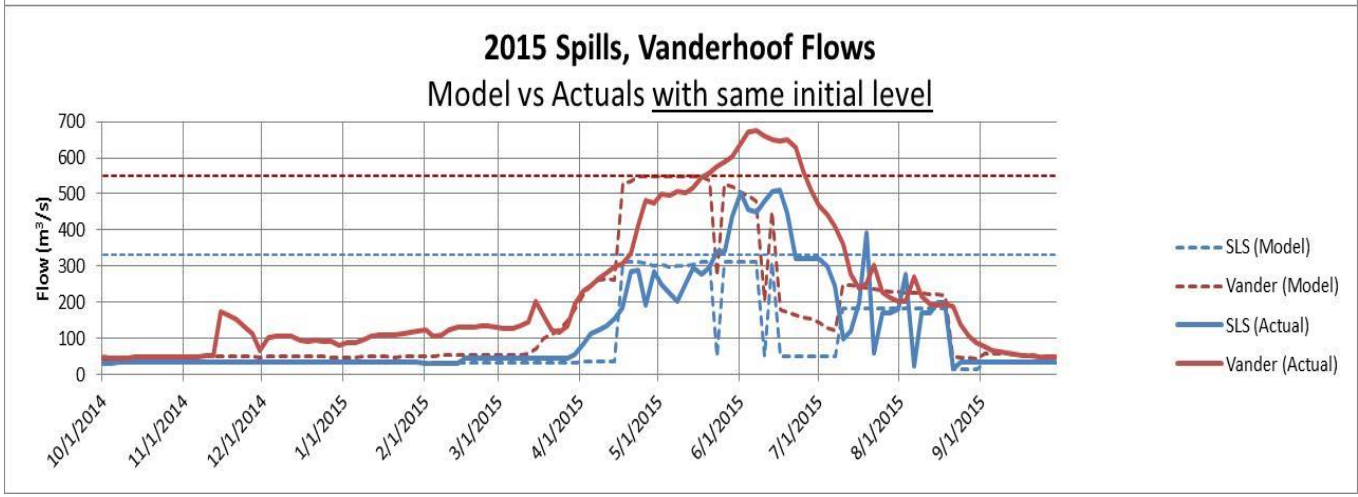
# Reservoir Operations in 2015

SDP Model output vs Actuals, with same initial reservoir level

**Observations**

- Initial reservoir level set to actual in Oct. 2014 (2791.3 ft)
- In the model, the higher power generation results in a lower reservoir level at the onset of spring freshet
- With the lower reservoir level, spills start in April and they do not need to exceed 310 cms to avoid flooding and overtopping the reservoir

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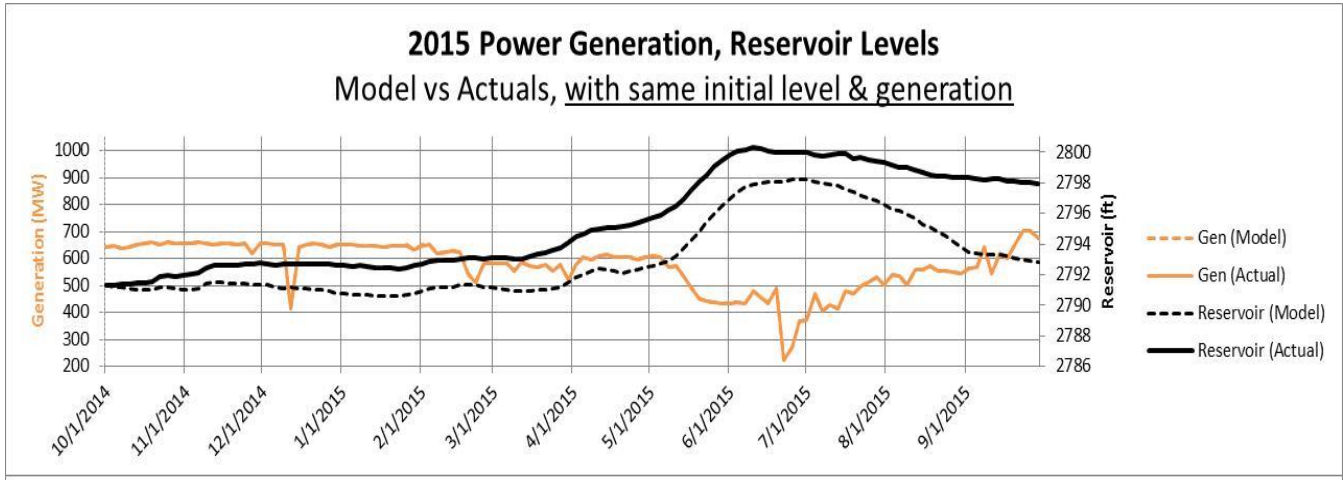
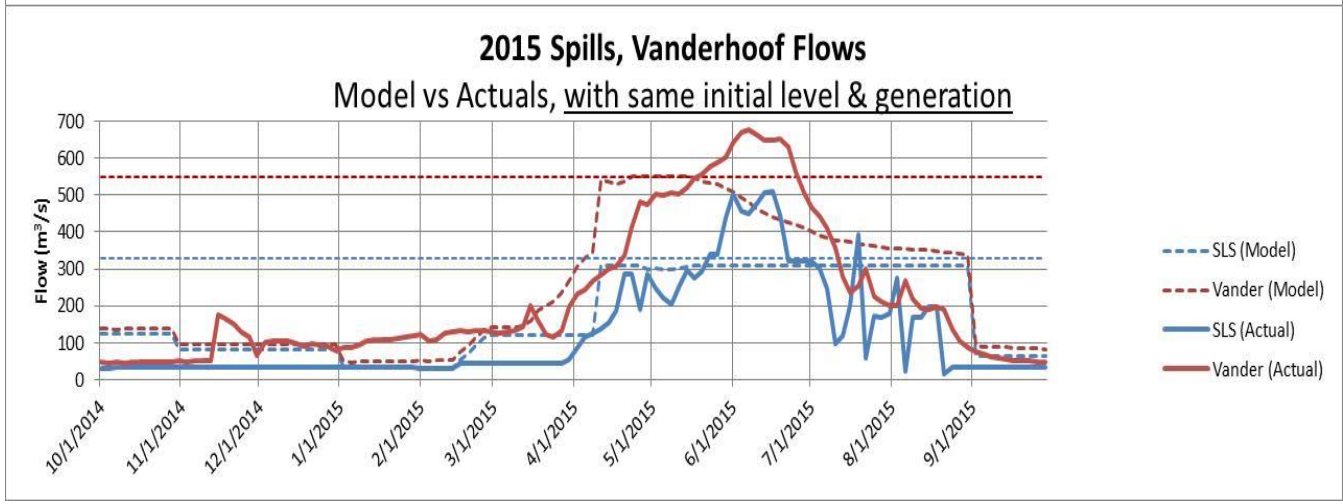
# Reservoir Operations in 2015

SDP Model output vs Actuals, with same initial reservoir level & power generation

**Observations**

- Initial reservoir level set to actual in Oct. 2014 (2791.3 ft)
- Same power generation is imposed
- In the model, spills are initiated as early as October 2014, and are maintained for the most part of winter. This explains the difference in reservoir elevations seen on the graph between Actual and Model.
- This strategy in the model is successful in avoiding flooding and overtopping the reservoir. However, it should not be seen as “what we should have done” at that time. Some elements in the modelling today on which the spill decision is based are different than the information that was available at that time.

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# Phase 1 Flow Alternatives

## Recap

# Phase 1 Flow Alternatives - Recap

## At our Last Meeting (Mtg #31)

### Round 2 Flow Alternatives

- Reviewed a series of flow alternatives with different combinations of reshaped base flow releases (mostly within the current water budget) plus some had higher targets to bump up flow releases in **'wetter'** years to lessen T2 power losses and provide addn benefits
- The surveys and resultant discussion highlighted that no alternative was acceptable to everyone, although **5D was the most heavily supported** (and to a lesser extent 4D), but there were concerns about the significance of T2 (low $CO_2$) power generation losses. But it was observed these losses may be overstated and/or avoidable as they seemed to occur in non-wet years?

***Agreement from Main Table …***

- Accordingly, the Main Table **conditionally supported Alternative 5D**, *if the results of a more detailed evaluation of T2 power losses were shown to be less significant!*

# Reminder - Phase 1 Operating Parameters

## Base Flow Conditions

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

- Meet hydropower flows to 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

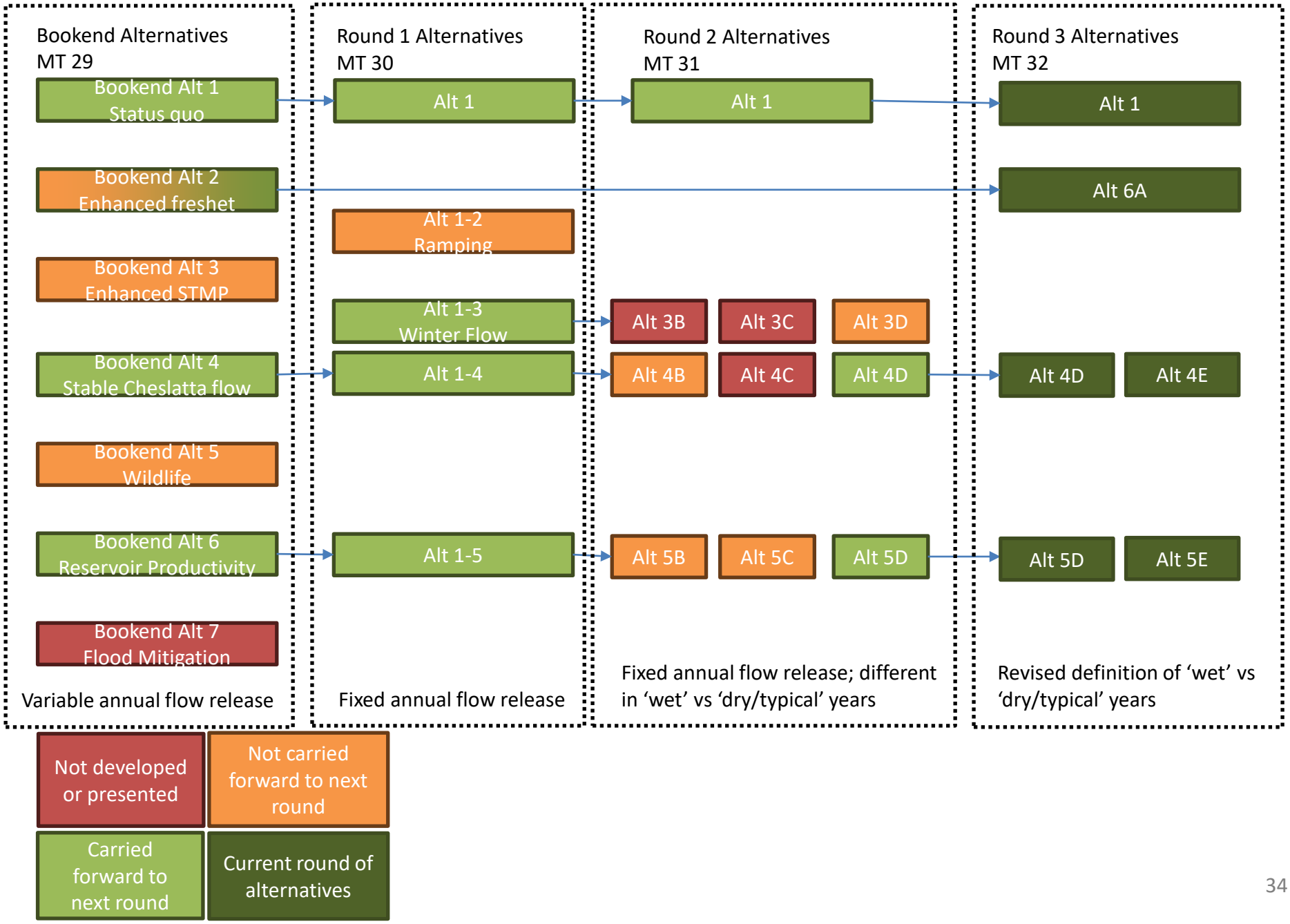
(i.e., parameters that could be altered and/or re-prioritized in development of bookends)

- Re-allocating monthly AWA flow release schedule
- Re-allocating some water from Tier 2 Hydropower sale
- Ramping rates at SLS
- Flood risk thresholds (e.g., Cheslatta Lake)
- Flow operations for beavers and avoiding ice jams

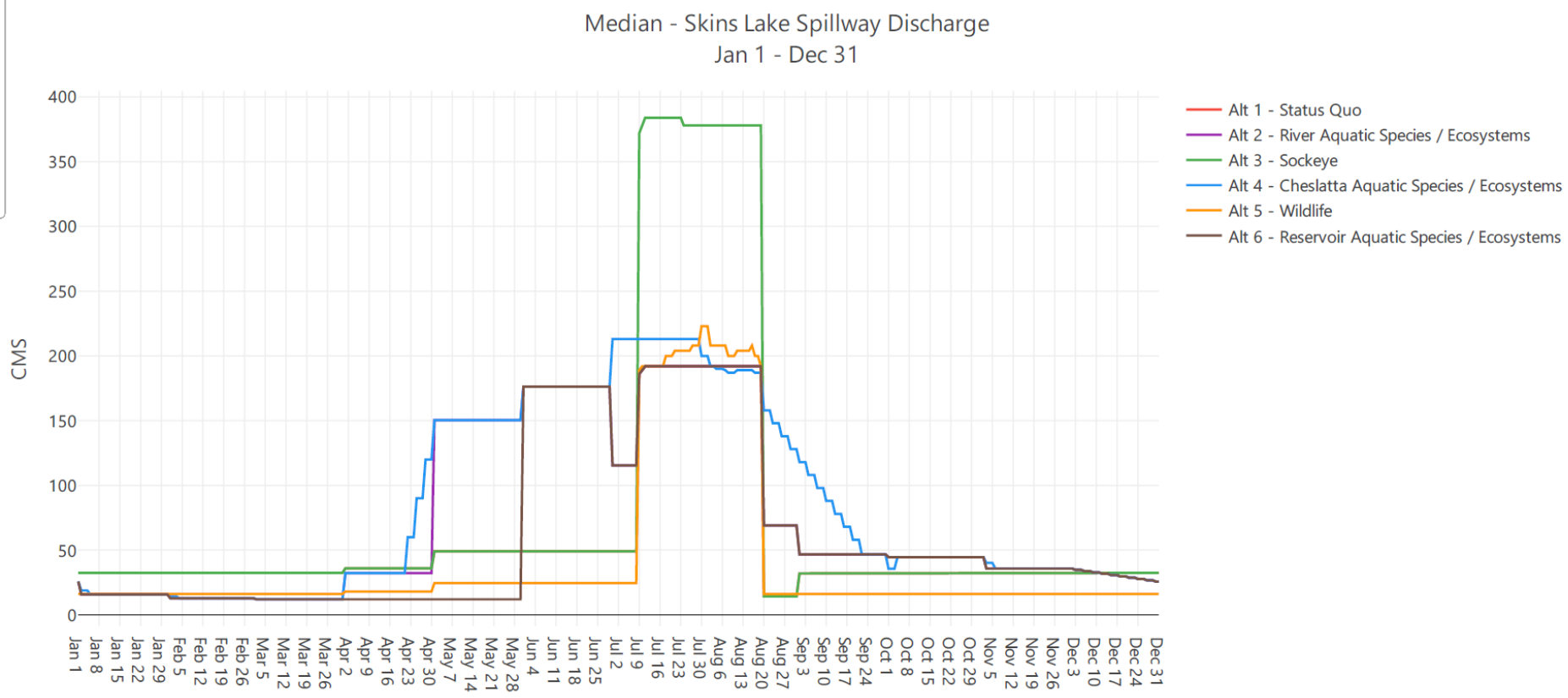
# Overview of the Tier 2 Power Loss Assessment and Evolution of New Phase 1 Flow Alternatives

# TWG Update: Flow Modeling

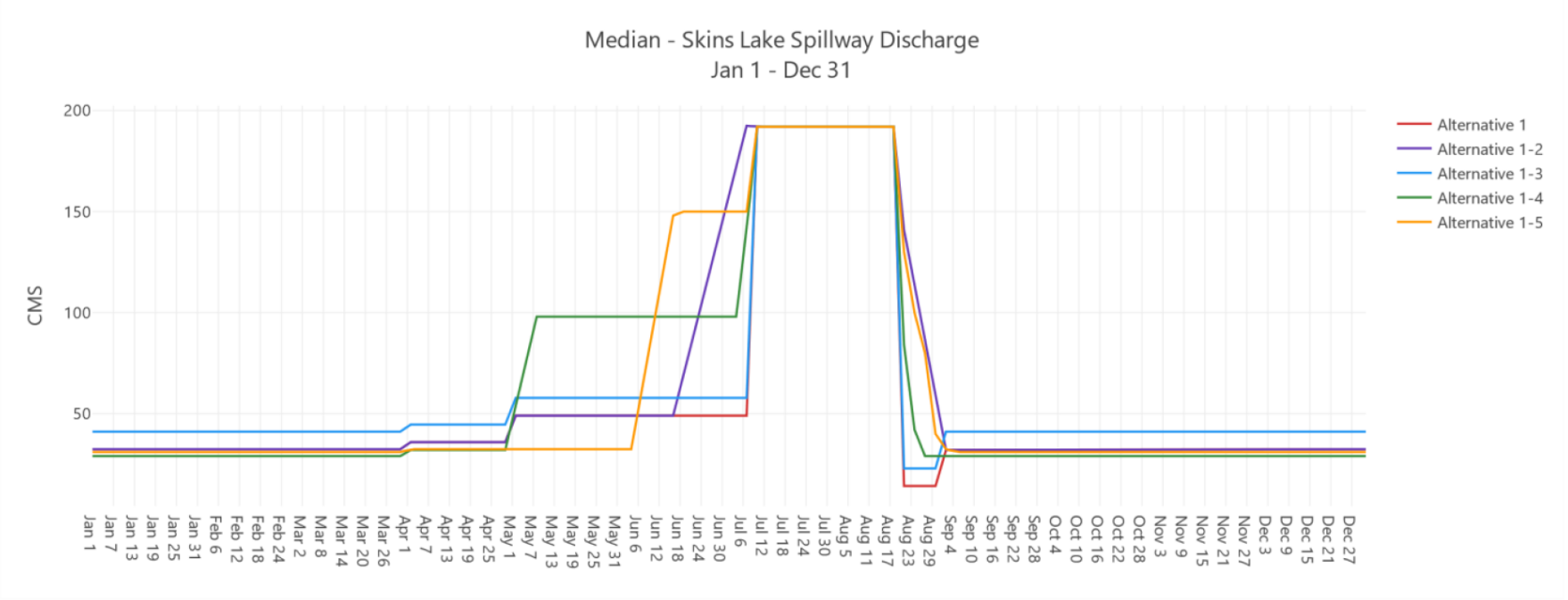
- ✓ Complete temperature modeling Alt 4D/5D
- ✓ Confirm Tier-2 modeling is accurate
- ✓Determine if Tier-2 loss can be mitigated when operationalized
- ✓Review wet/dry year definitions to minimize Tier-2 loss
- ✓ Reconcile discrepancy in Vanderhoof flooding between model and actual (2015 example)


Bookend Alternatives
MT 29
Bookend Alt 1
Status quo
Bookend Alt 2
Enhanced freshet
Bookend Alt 3
Enhanced STMP
Bookend Alt 4
Stable Cheslatta flow
Bookend Alt 5
Wildlife
Bookend Alt 6
Reservoir Productivity
Bookend Alt 7
Flood Mitigation
Variable annual flow release
Round 1 Alternatives
MT 30
Alt 1
Alt 1-2
Ramping
Alt 1-3
Winter Flow
Alt 1-4
Alt 1-5
Fixed annual flow release
Round 2 Alternatives
MT 31
Alt 1
Alt 3B
Alt 3C
Alt 3D
Alt 4B
Alt 4C
Alt 4D
Alt 5B
Alt 5C
Alt 5D
Fixed annual flow release; different in 'wet' vs 'dry/typical' years
Round 3 Alternatives
MT 32
Alt 1
Alt 6A
Alt 4D
Alt 4E
Alt 5D
Alt 5E
Revised definition of 'wet' vs 'dry/typical' years
Not developed or presented
Not carried forward to next round
Carried forward to next round
Current round of alternatives

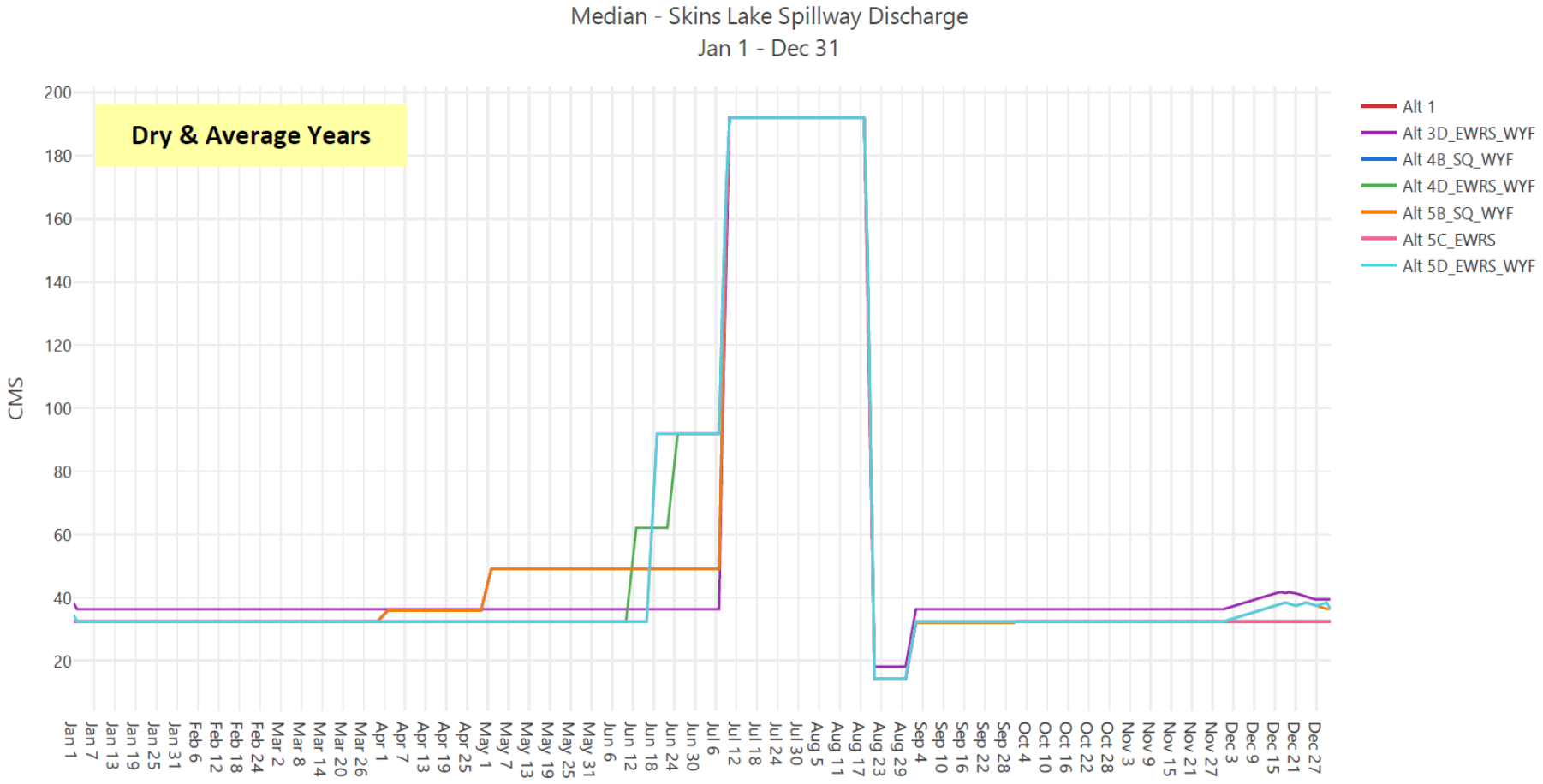
# Bookend Alternatives



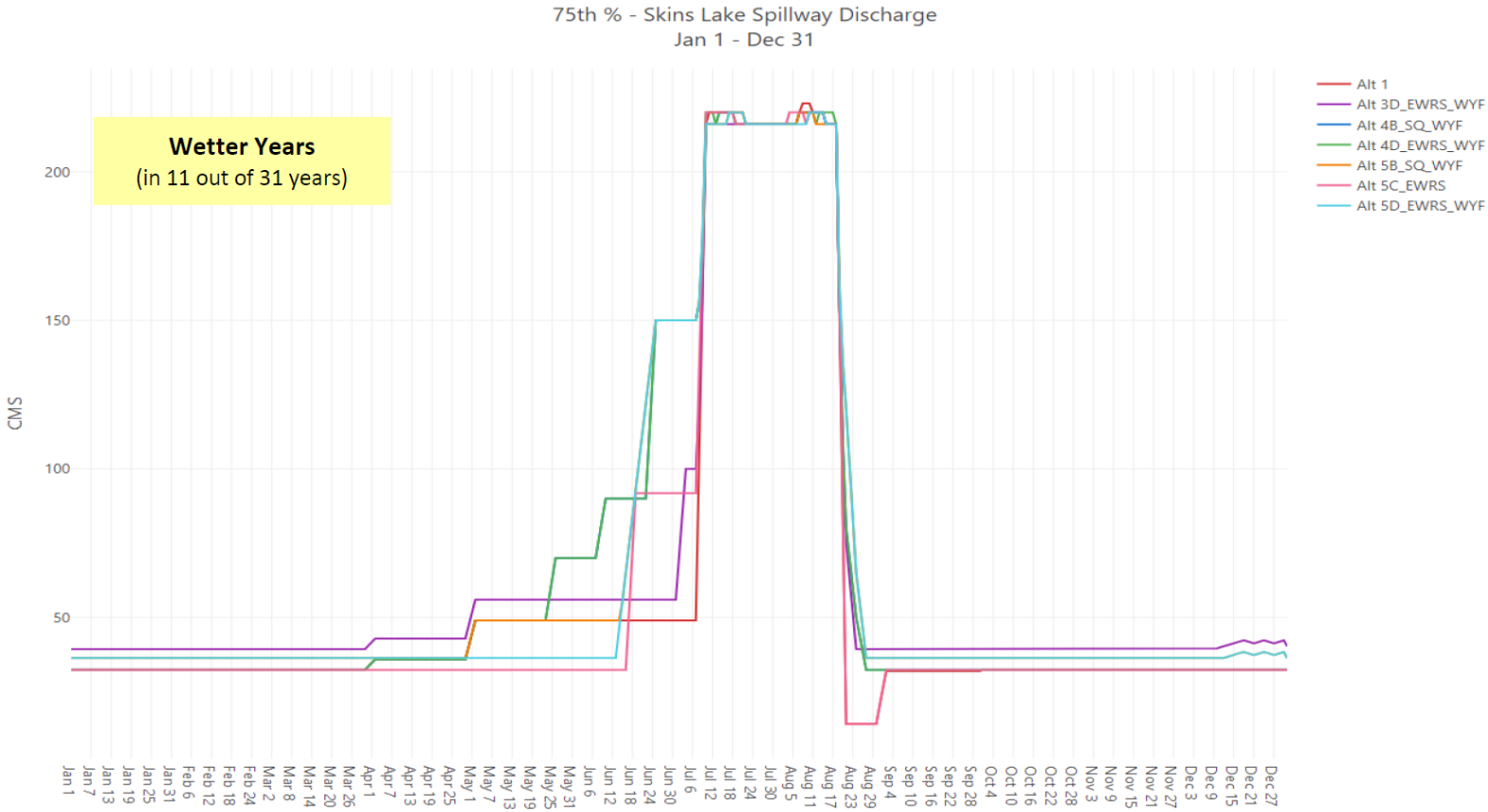
# Round 1 Alternatives



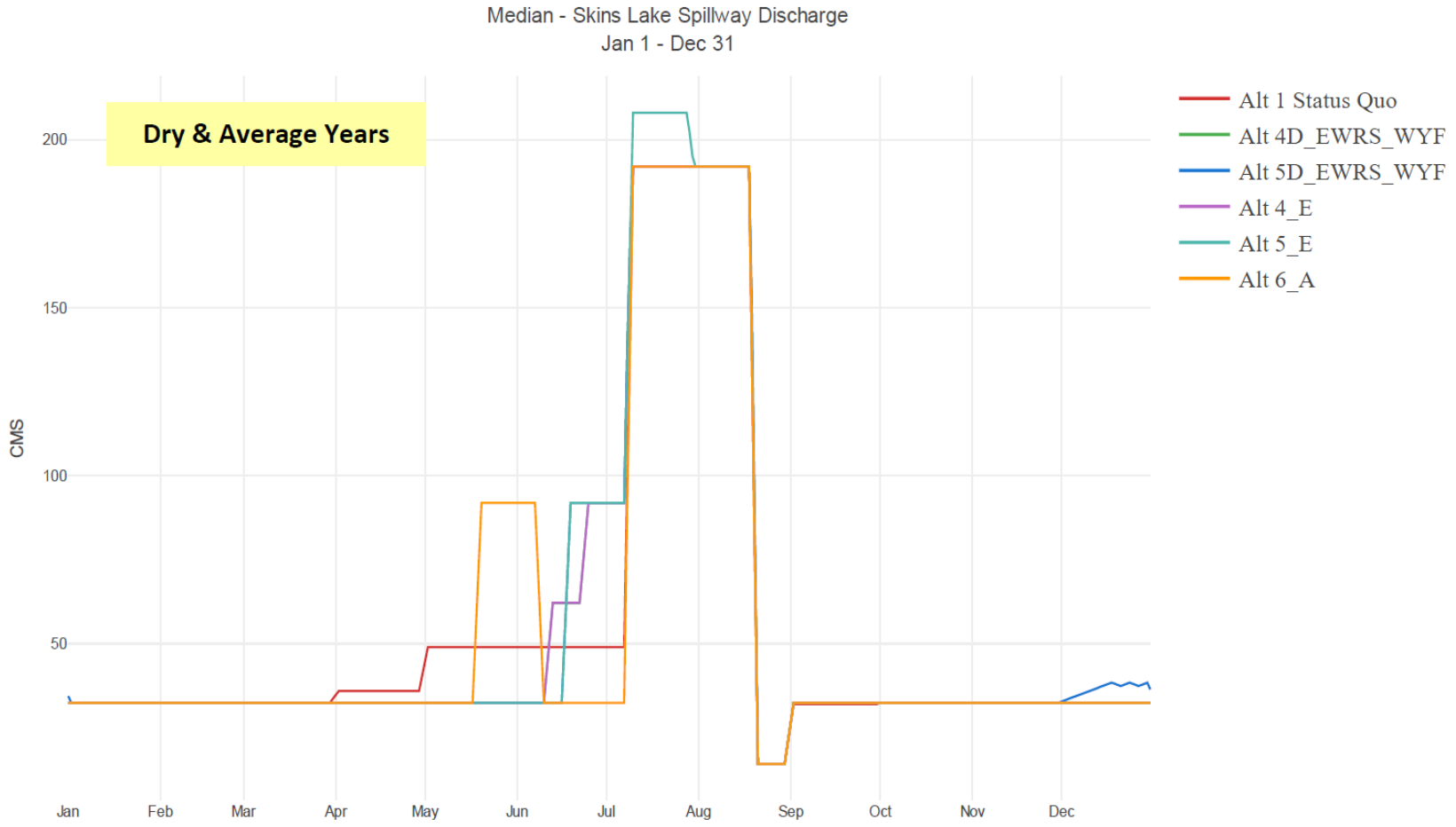
# Round 2 Alternatives



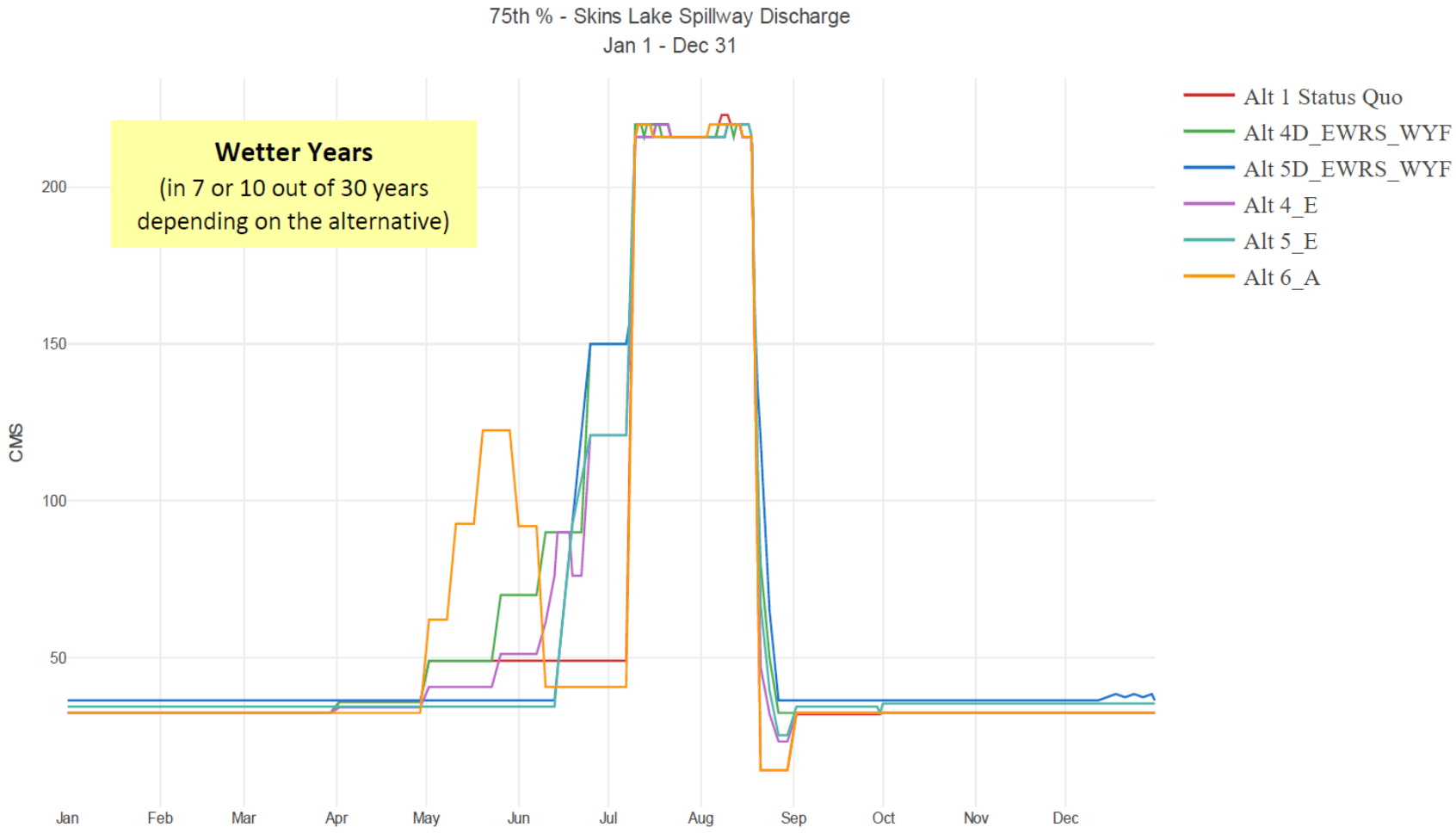
# Round 2 Alternatives



# Round 3 Alternatives



# Round 3 Alternatives



# Key Learnings?

- Anything else to highlight in terms of the key learnings that were not covered in the above slides?

# Phase 1 Flow Alternatives

## for Meeting #32

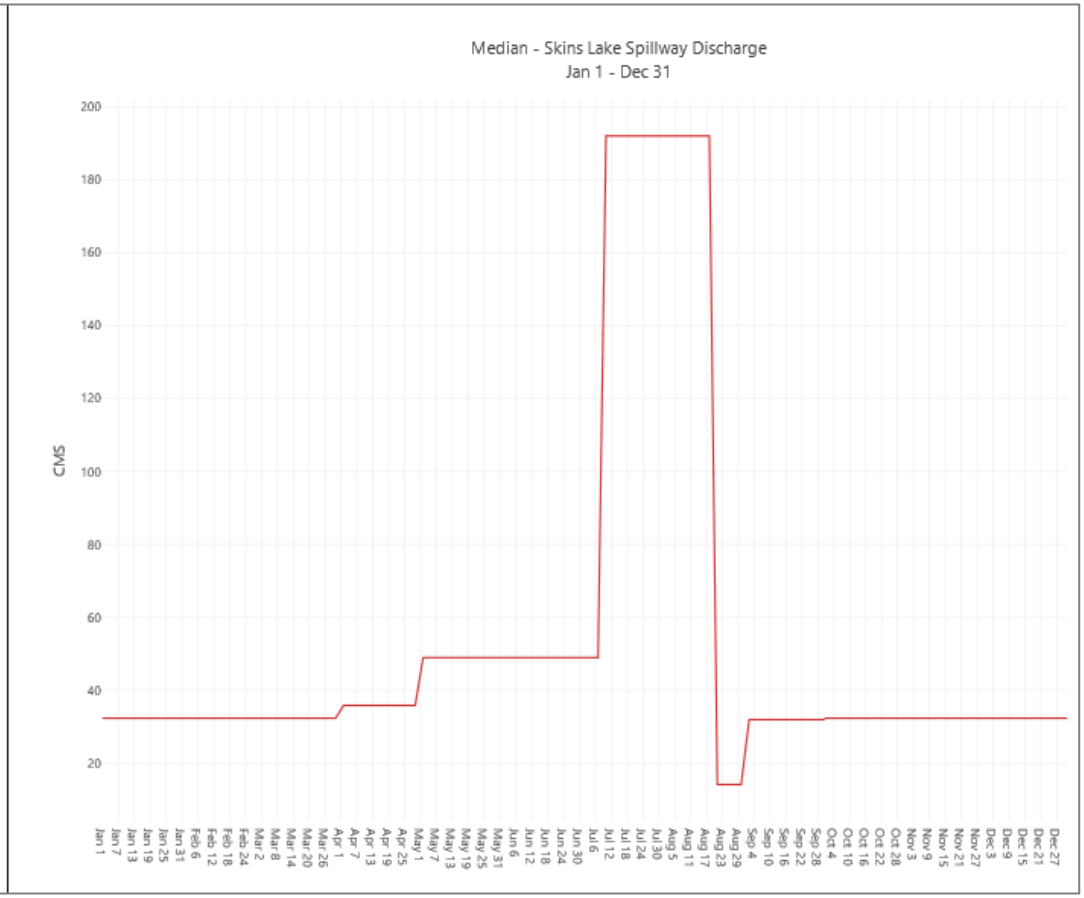
# Summary

| Alternative | Description (Rationale) |
|---|---|
| **Alt 1** (Status Quo) | • Current operations (existing water budget) |
| **Alt 4D** | • New hybrid alternative<br>• Reshaped existing water budget minimum flow in "dry/normal" years<br>• Flow targets (extra water) in "wet" years to provide a more natural freshet (increased flow, stepped increases to STMP) |
| **Alt 5D** | • New hybrid alternative<br>• Reshaped existing water budget minimum flow in "dry/normal" years<br>• Flow targets (extra water) in "wet" years to maximize reservoir productivity (high reservoir, delayed freshet) |
| **New Alt 4E** | • Same flow release timing and magnitude as Alternative 4D<br>• Wet years have been revised based on information that would be available in forecast (e.g., snowpack, reservoir elevation) |
| **New Alt 5E** | • Same flow release timing and magnitude as Alternative 5D<br>• Wet years have been revised based on information that would be available in forecast (e.g., snowpack, reservoir elevation) |
| **New Alt 6A** | • New hybrid alternative<br>• Reshaped existing water budget minimum flow in "dry/normal" years, flow targets (extra water) in "wet years"<br>• Flow releases earlier in the year reduces uncertainty between known water availability (i.e., pre-freshet spills) and desired release timing. Releases timed to align with freshet and minimize impacts to Tier 2 power generation<br>• Same "wet" and "dry/normal" years as Alt 4E and Alt 5E |

# Review: Alternative 1 Status Quo

**Alternative 1 – Status Quo (red)**

This alternative is the flow scenario RT implements now. It incorporates water license and other flow related criteria that are currently used to manage the water control facilities, such as (a) STMP and AWA minimum flows, (b) Cheslatta and Vanderhoof flooding maximums, (c) flow release timing for beavers, (d) ice-jam avoidance, etc.



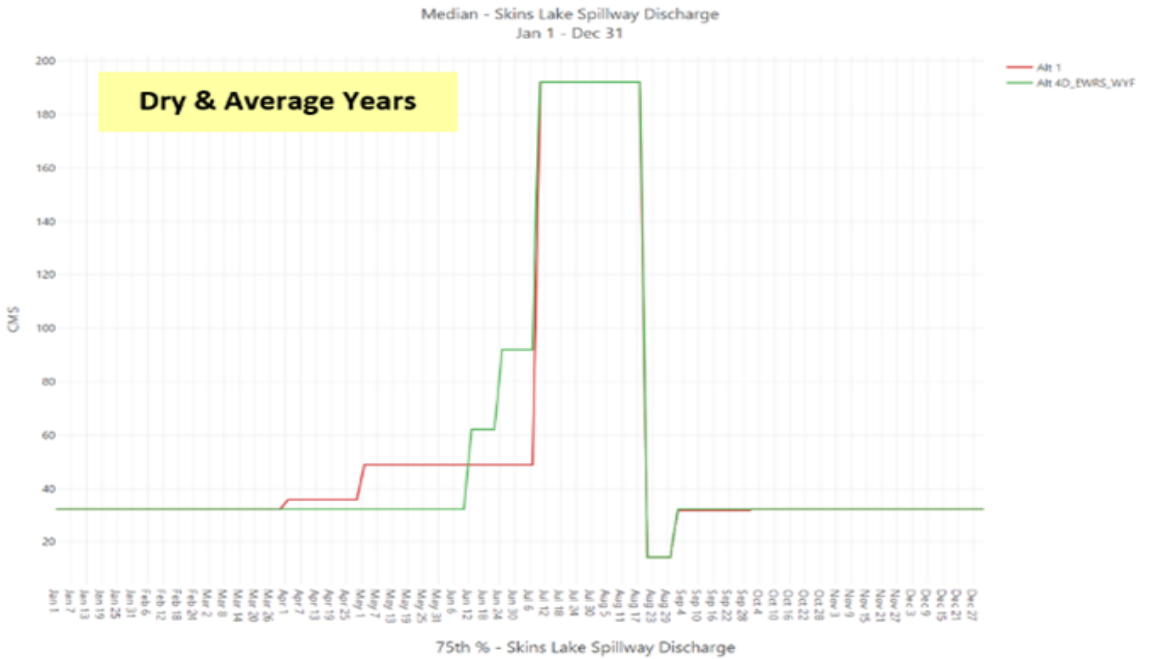
# Review: Alternative 4D

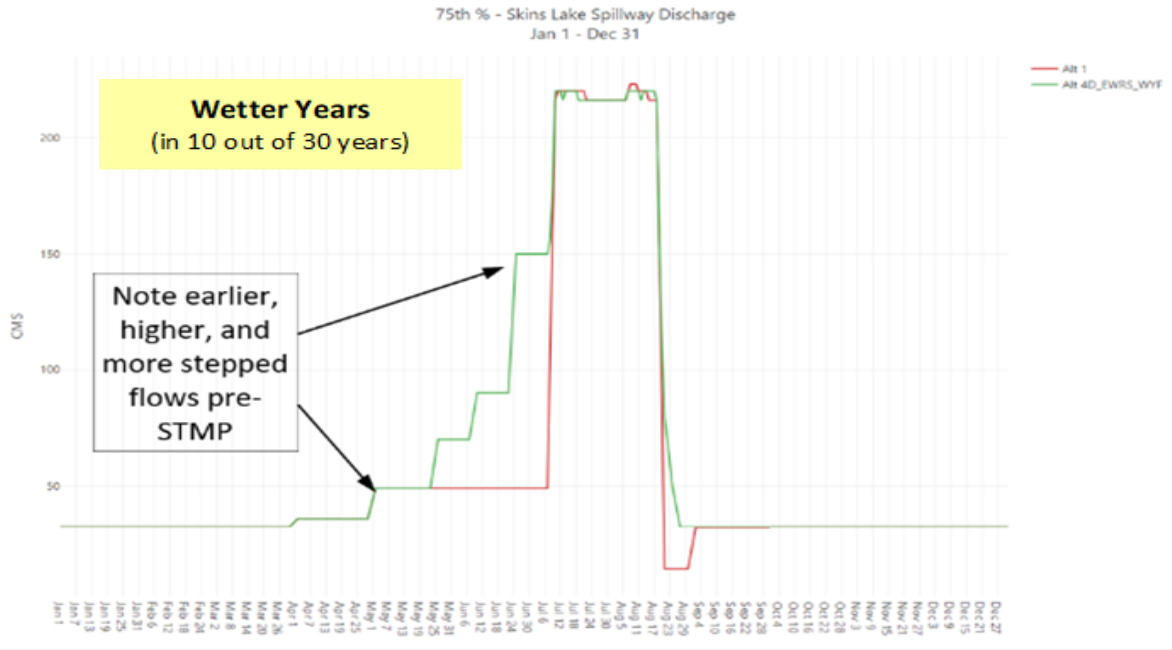
**Alternative 4D** (green)

During dry and typical years, the status quo hydrograph has been reshaped to provide a two step flow increase over 4 weeks prior to STMP (each increase is ~30 $m^3/s$).

During wet years the freshet flow release has been re-shaped to provide a multi-step flow increase prior to STMP, and flow outside of the STMP has been increased.

More natural freshet (increased flow, stepped flows leading to STMP)



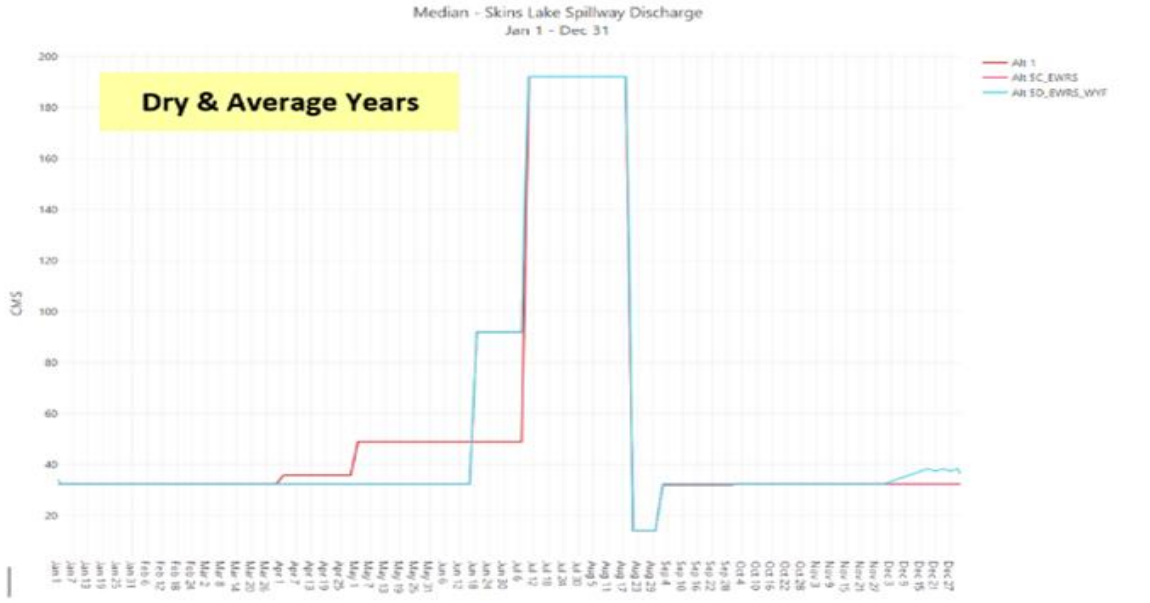
# Review: Alternative 5D

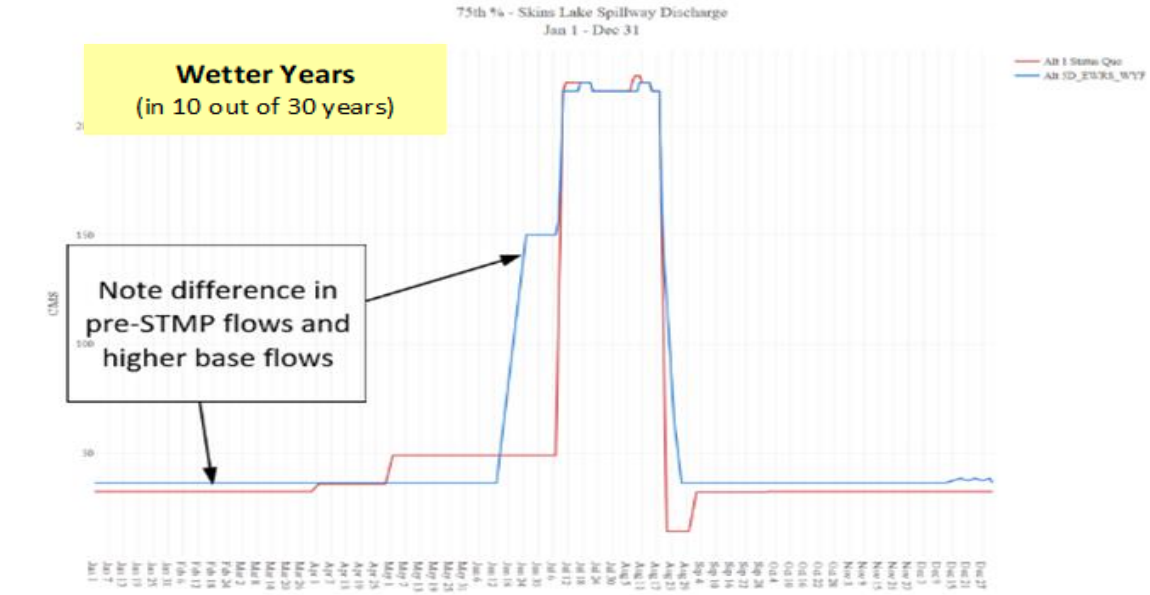
**Alternative 5D** (cyan/blue)

During dry and typical years, the status quo hydrograph has been reshaped to provide a single step flow increase for 3 weeks prior to STMP (~92 m³/s).

During wet years, flow outside of the STMP has been increased, the freshet flow release is delayed, and more gradual rates of flow change (ramping rates) are provided.

Reservoir Productivity (higher reservoir, delayed freshet)



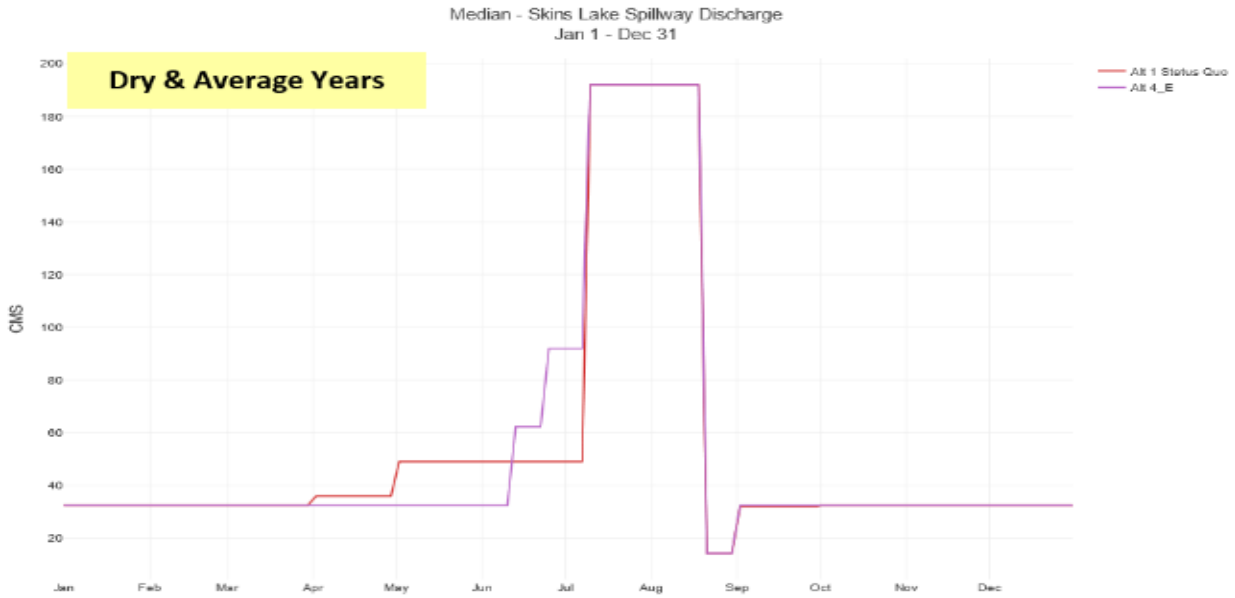



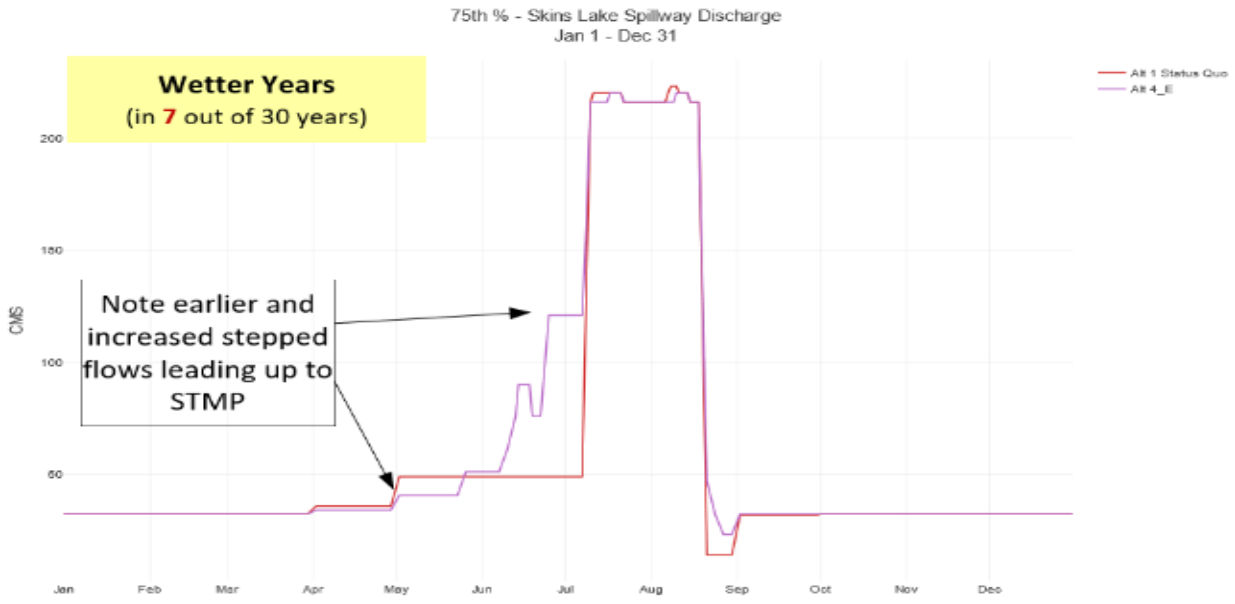
# *New*: Alternative 4E

**Alternative 4E** (purple)

Same flow release timing and magnitude as Alternative 4D

Wet years have been revised based on information that would be available in forecast (e.g., snowpack, reservoir elevation). This resulted in 7 out of 30 years being defined as 'wet' years when additional flow releases would be triggered.



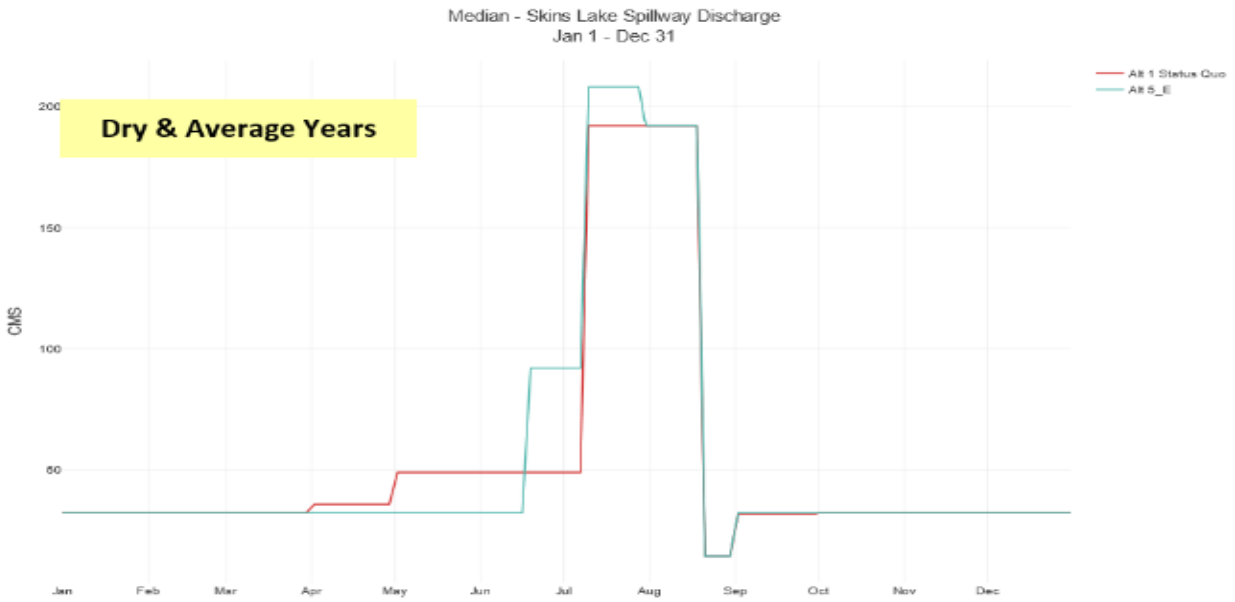



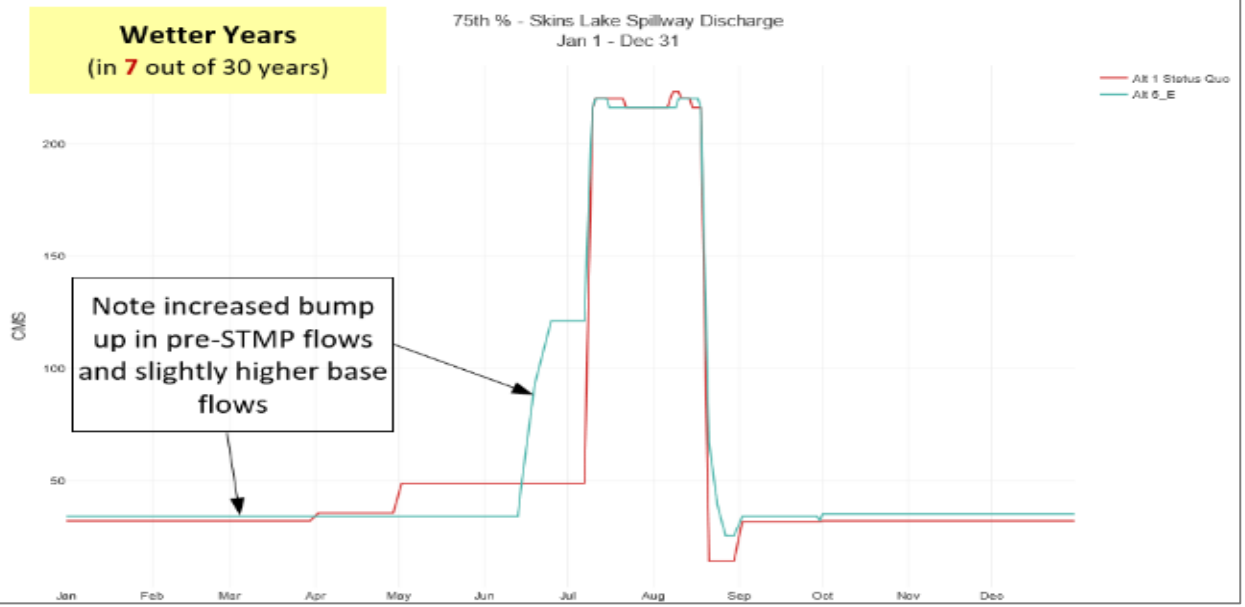
# *New*: Alternative 5E

**Alternative 5E**

Same flow release timing and magnitude as Alternative 5D

Wet years have been revised based on information that would be available in forecast (e.g., snowpack, reservoir elevation). This resulted in 7 out of 30 years being defined as 'wet' years when additional flow releases would be triggered.



# *New*: Alternative 6A

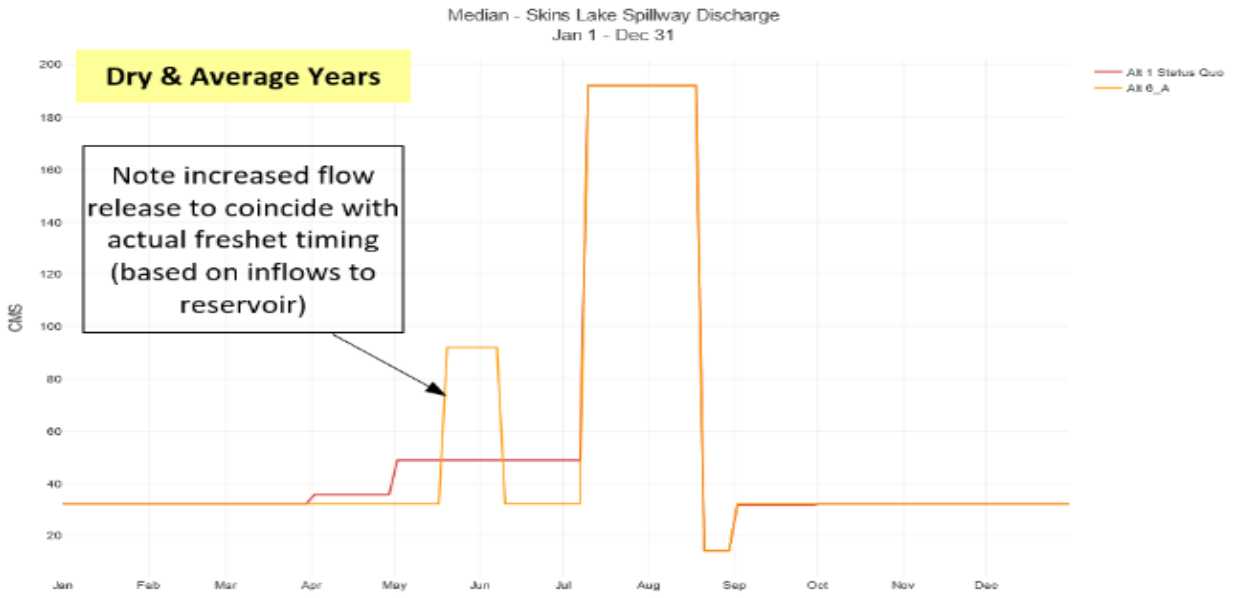
**Alt 6A (orange)**

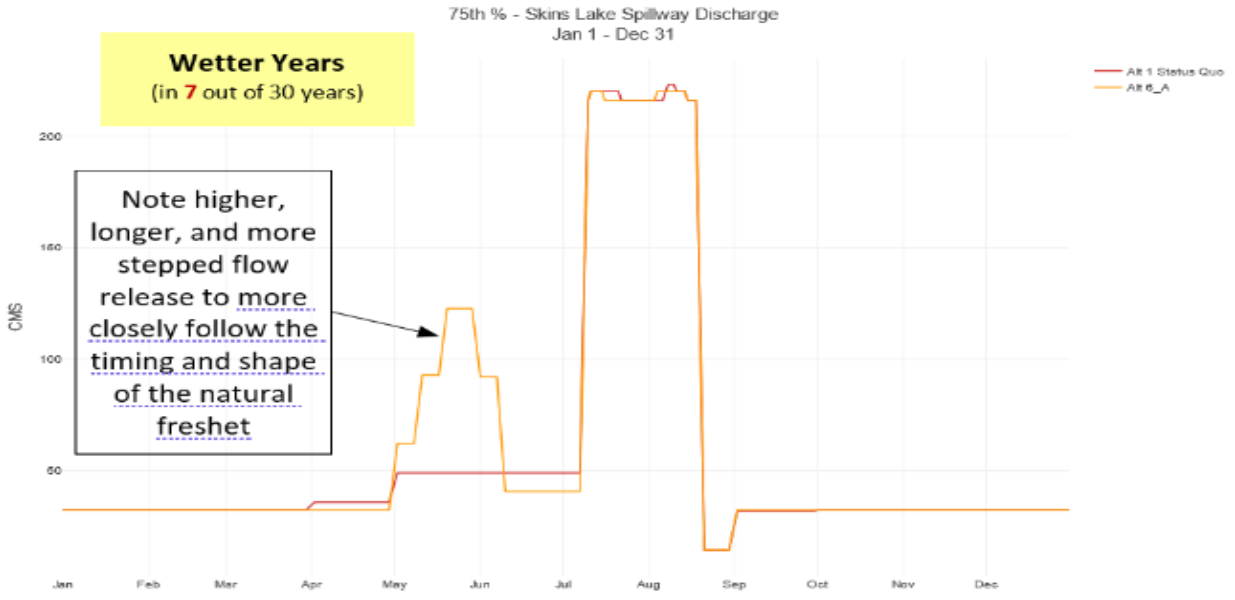
New concept hybrid alternative

Reshaped existing water budget minimum flows in “dry/normal” years, flow targets (extra water) in “wet years”

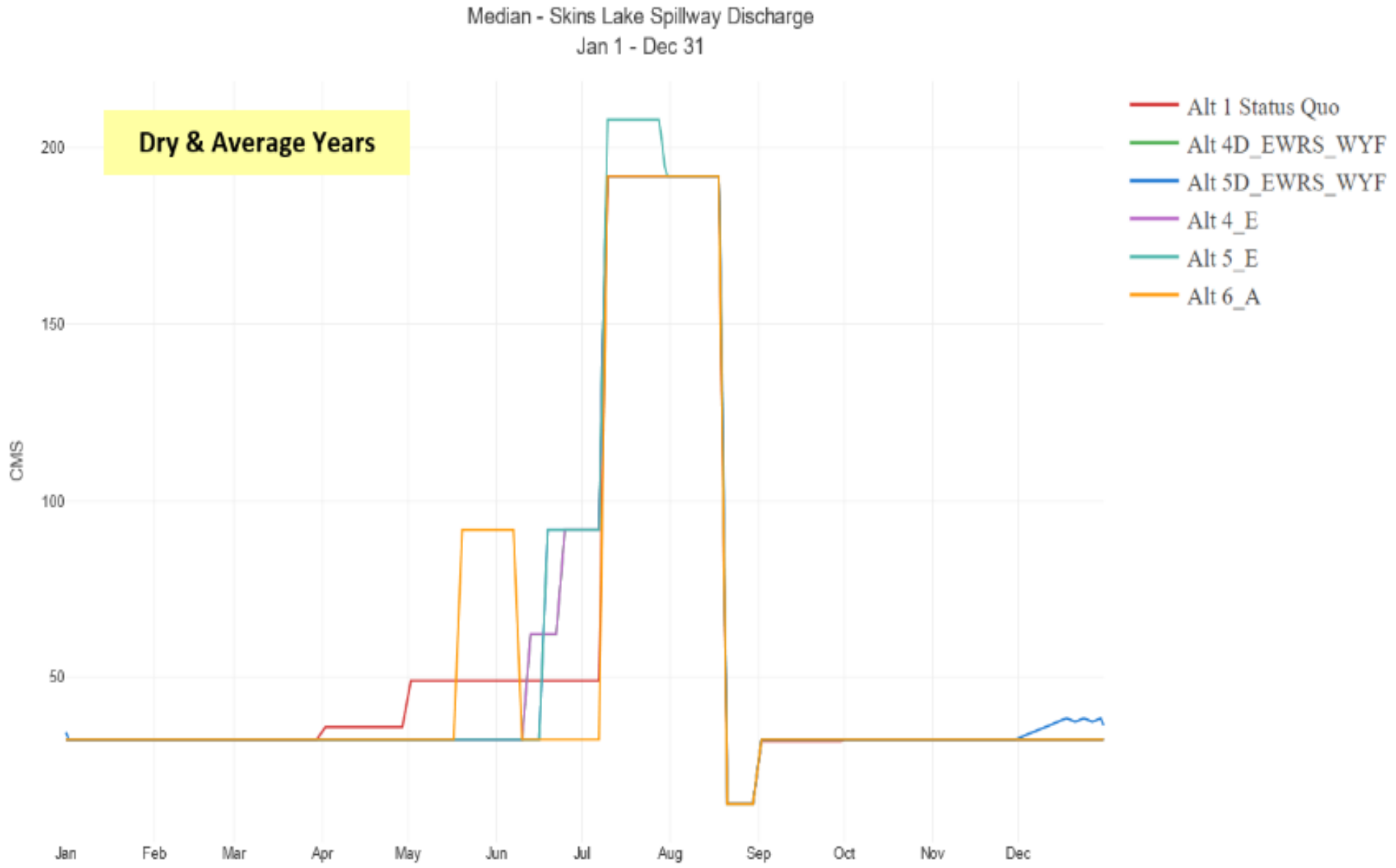
Flow releases earlier in the year reduces uncertainty between known water availability (i.e., pre-freshet spills) and desired release timing. Releases timed to align with freshet and minimize impacts to Tier 2 power generation

Same “wet” and “dry/normal” years as Alt 4E and Alt 5E

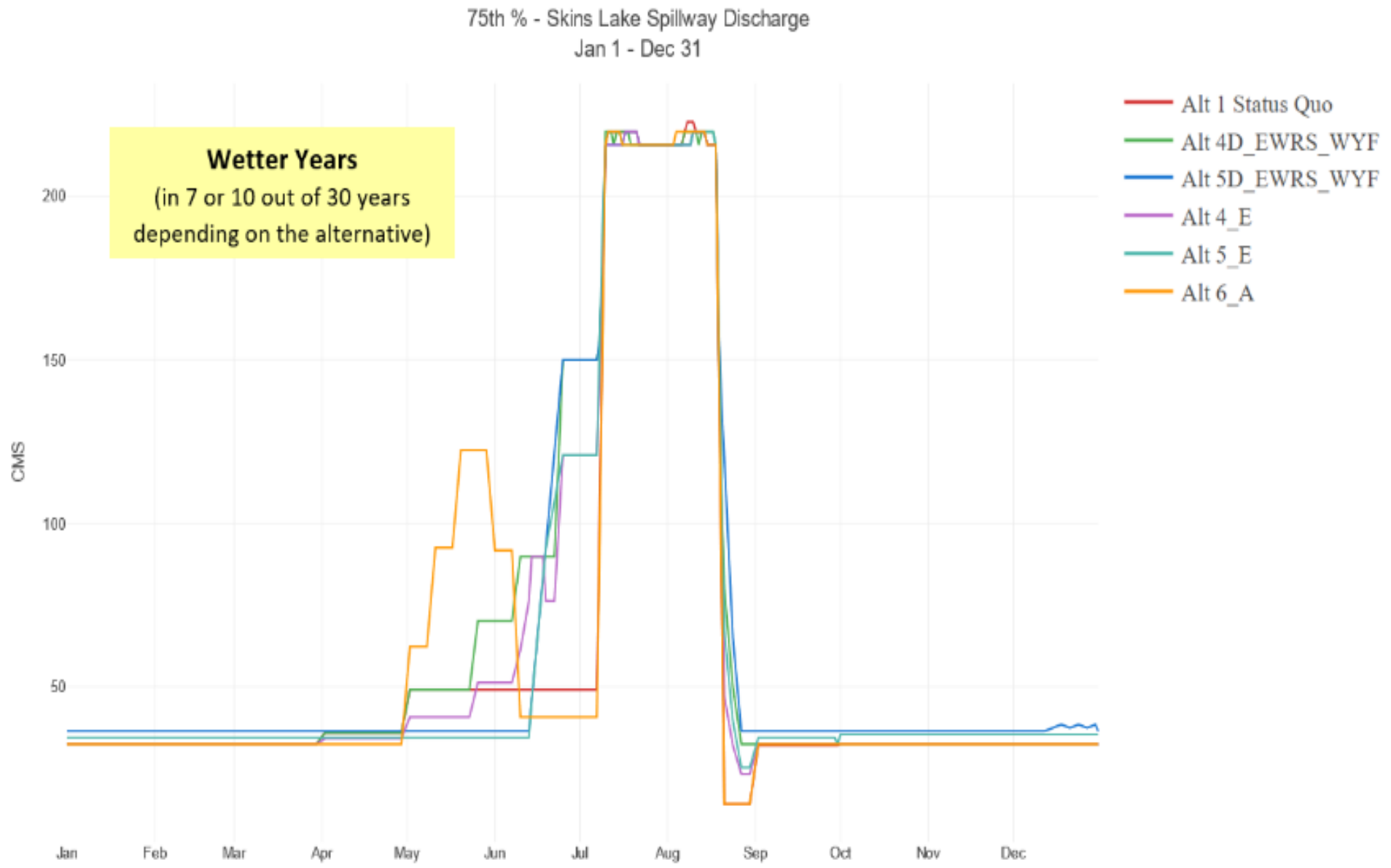


# Comparison


Median - Skins Lake Spillway Discharge
Jan 1 - Dec 31
Dry & Average Years
CMS
200
150
100
50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Alt 1 Status Quo
Alt 4D_EWRS_WYF
Alt 5D_EWRS_WYF
Alt 4_E
Alt 5_E
Alt 6_A

# Comparison

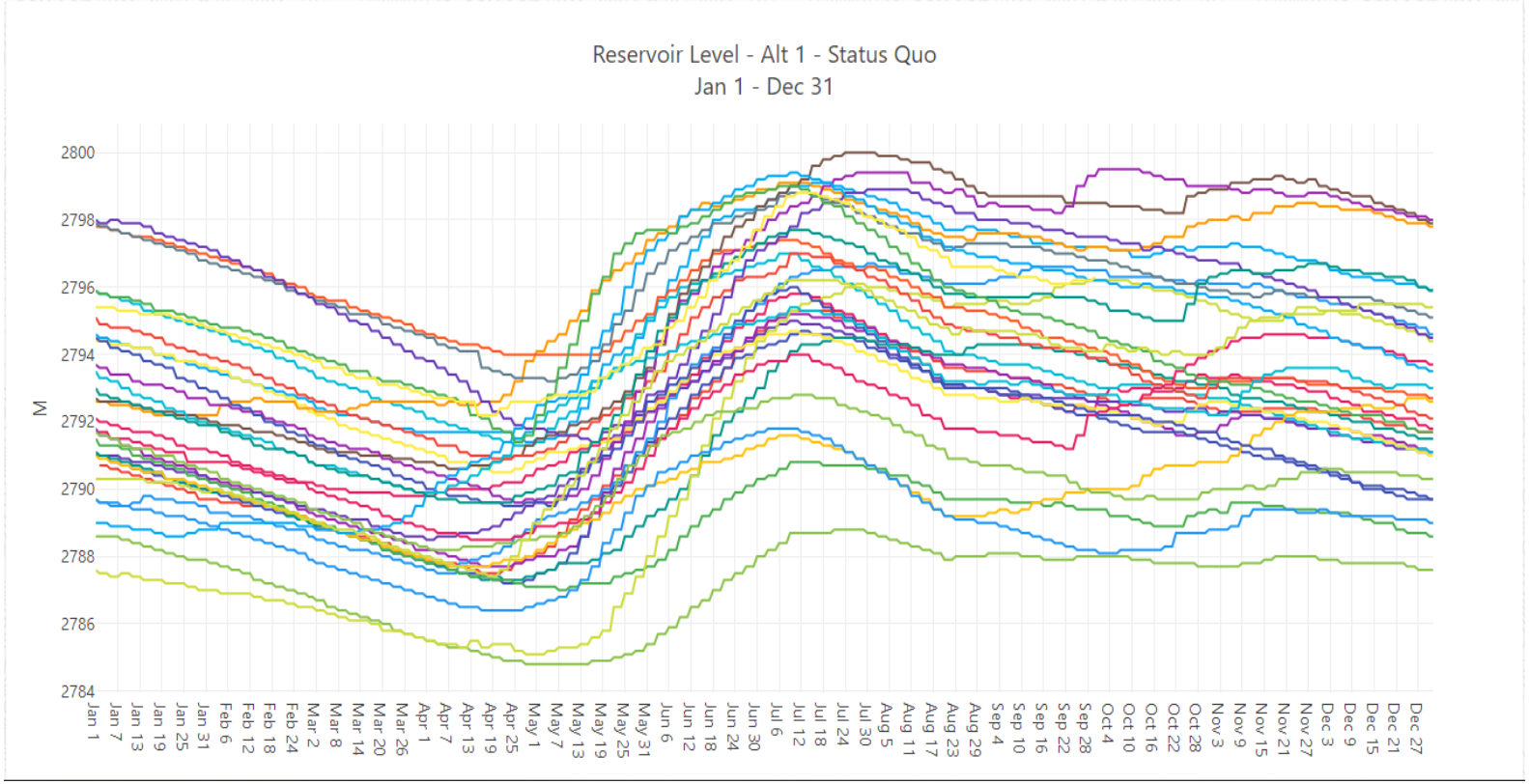

75th % - Skins Lake Spillway Discharge
Jan 1 - Dec 31
Wetter Years
(in 7 or 10 out of 30 years
depending on the alternative)
CMS
200
150
100
50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Alt 1 Status Quo
Alt 4D_EWRS_WYF
Alt 5D_EWRS_WYF
Alt 4_E
Alt 5_E
Alt 6_A

# Questions or clarifications

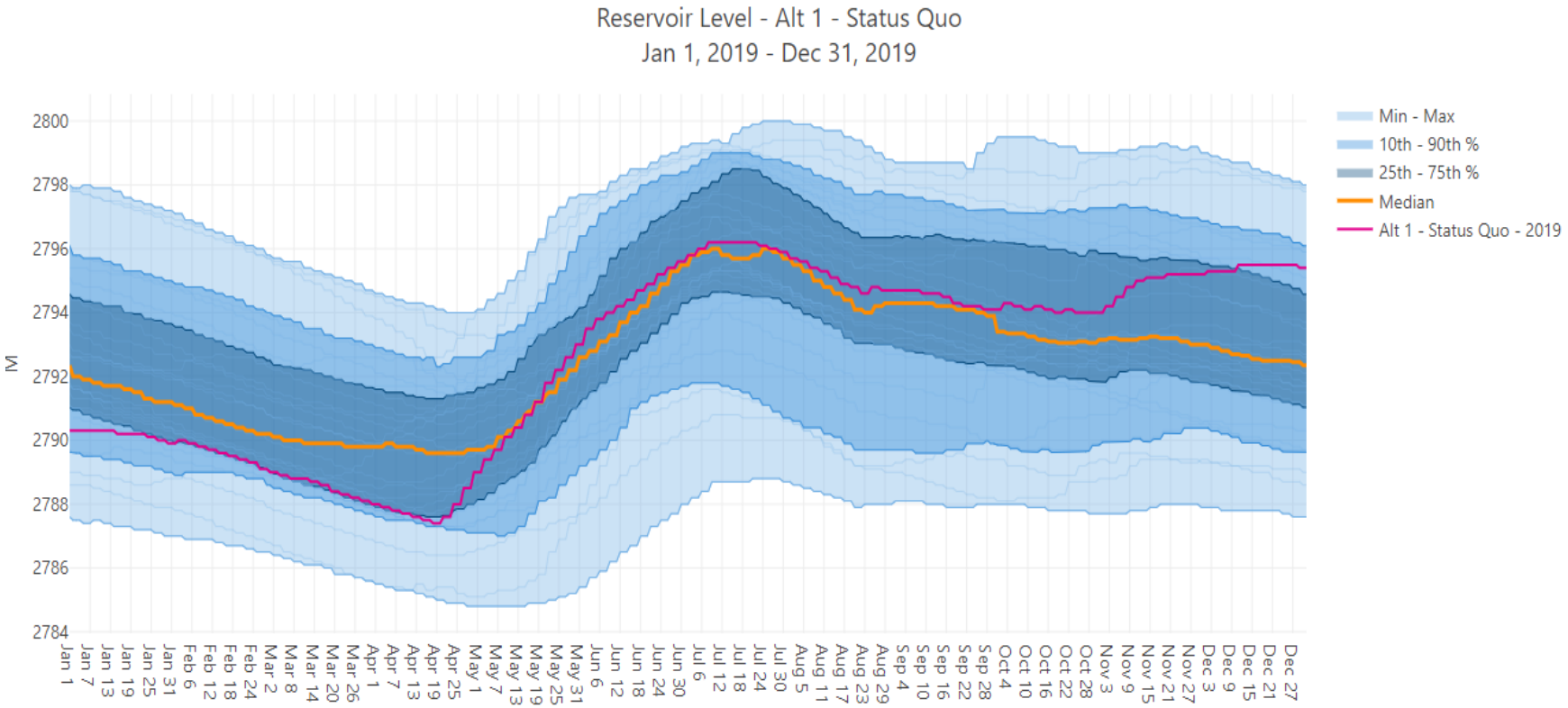
# Phase 1 Flow Alternatives

## Assessing Hydrology

# Modeling Outputs: Using Hydrographs



# Modeling Outputs: Using Hydrographs

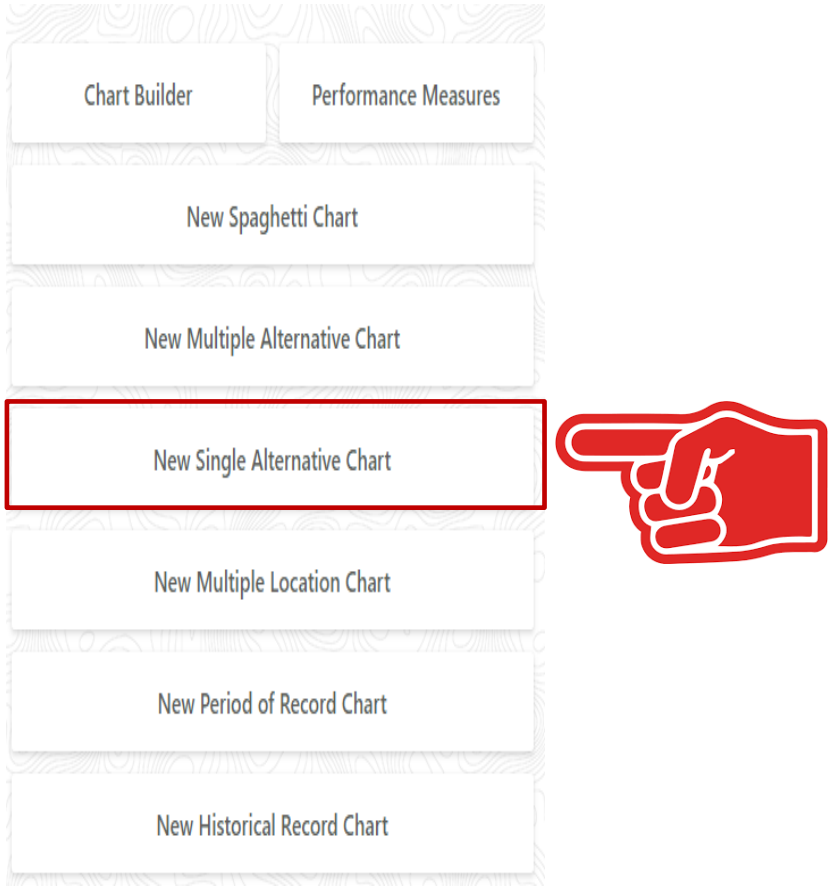


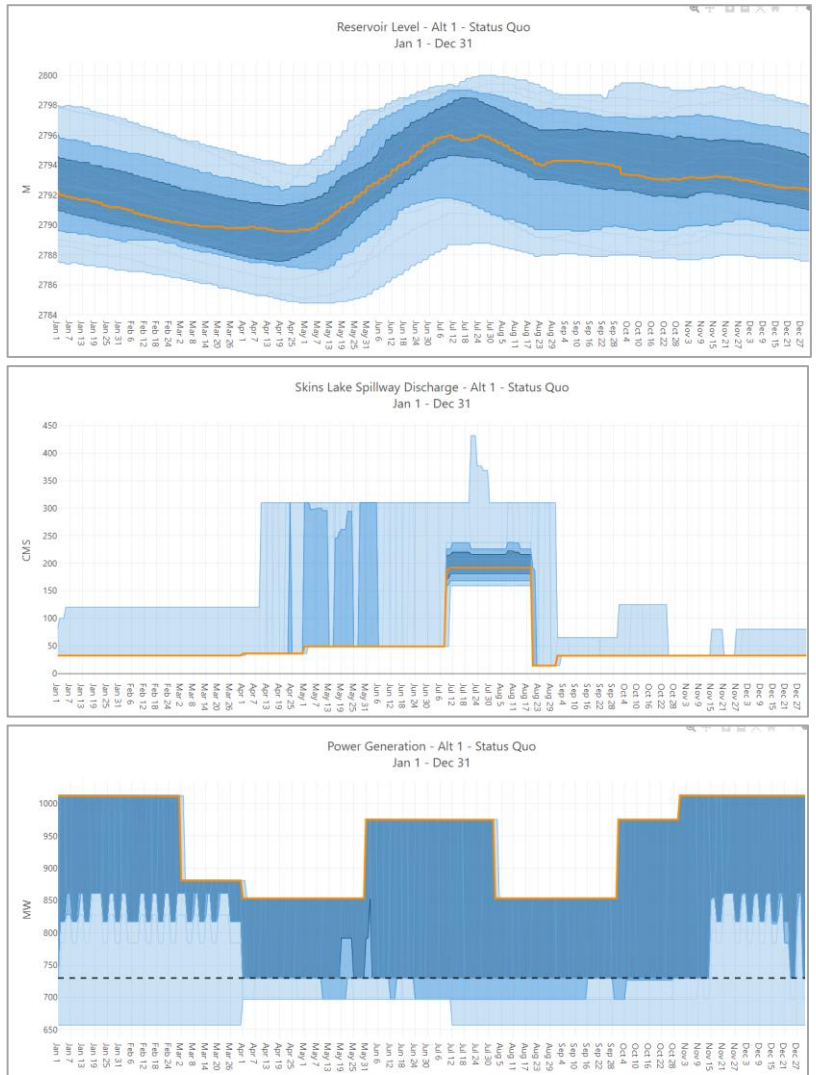

| | | |
|---|---|---|
| | Maximum | Across the entire dataset, the maximum value recorded on a given day |
| | 90th percentile | 90 % of all recorded values were below this point, and 10% were above. This represents a 1 in 10 year **higher** river flow / or higher reservoir level event |
| | 75th percentile | 75 % of all recorded values were below this point, and 25% were above |
| | 50th 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. |
| | 25th percentile | 25 % of all recorded values were below this point, and 75% were above |
| | 10th 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



# HydroViz – Online Tool

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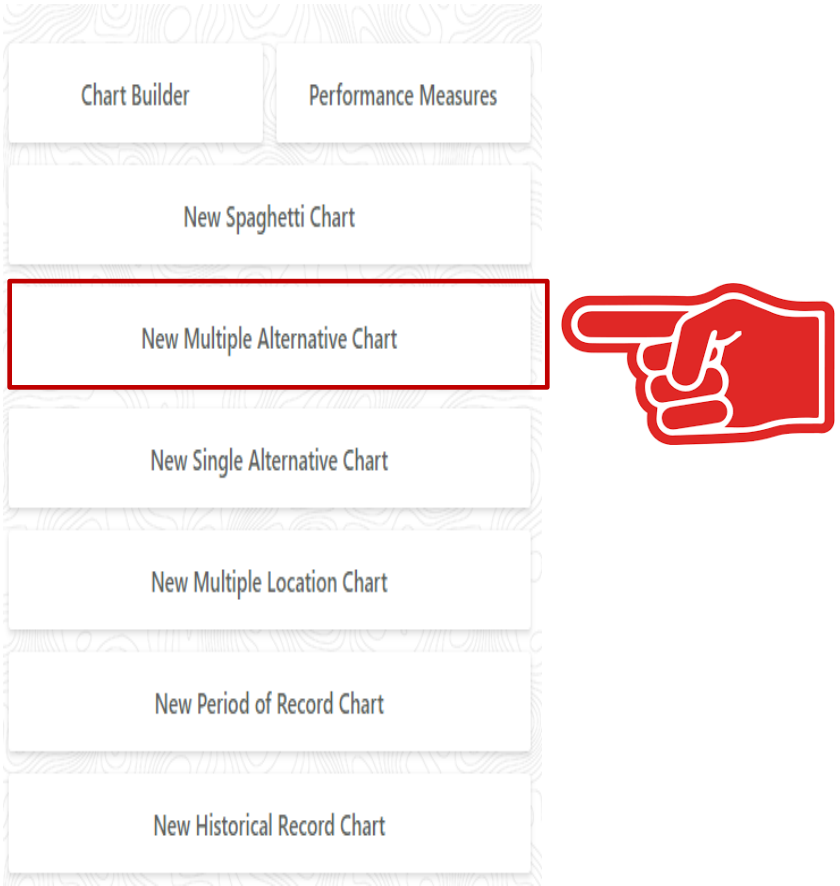
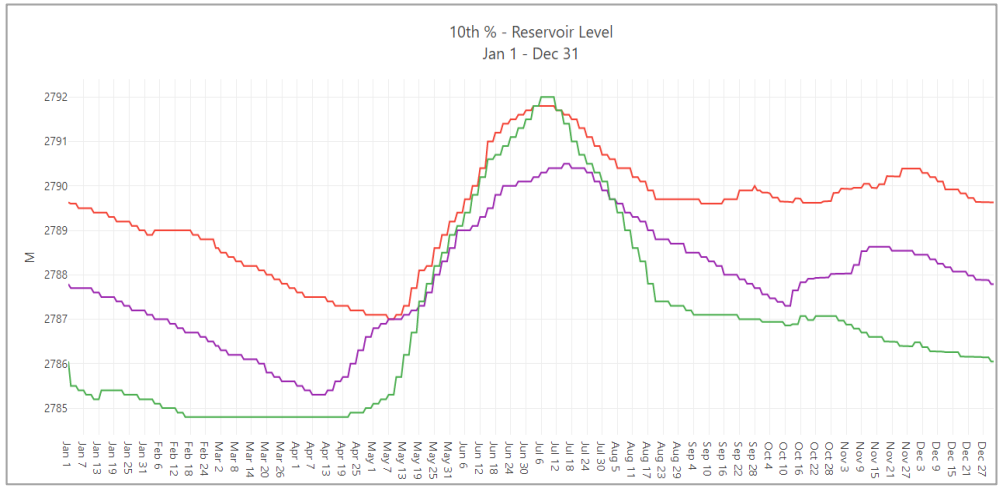
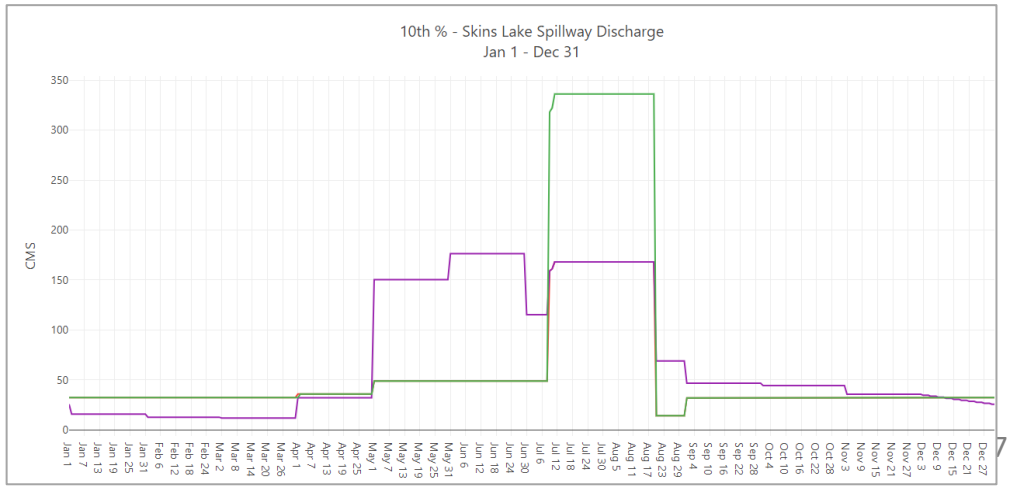
Access Code: NECHAKOWEI



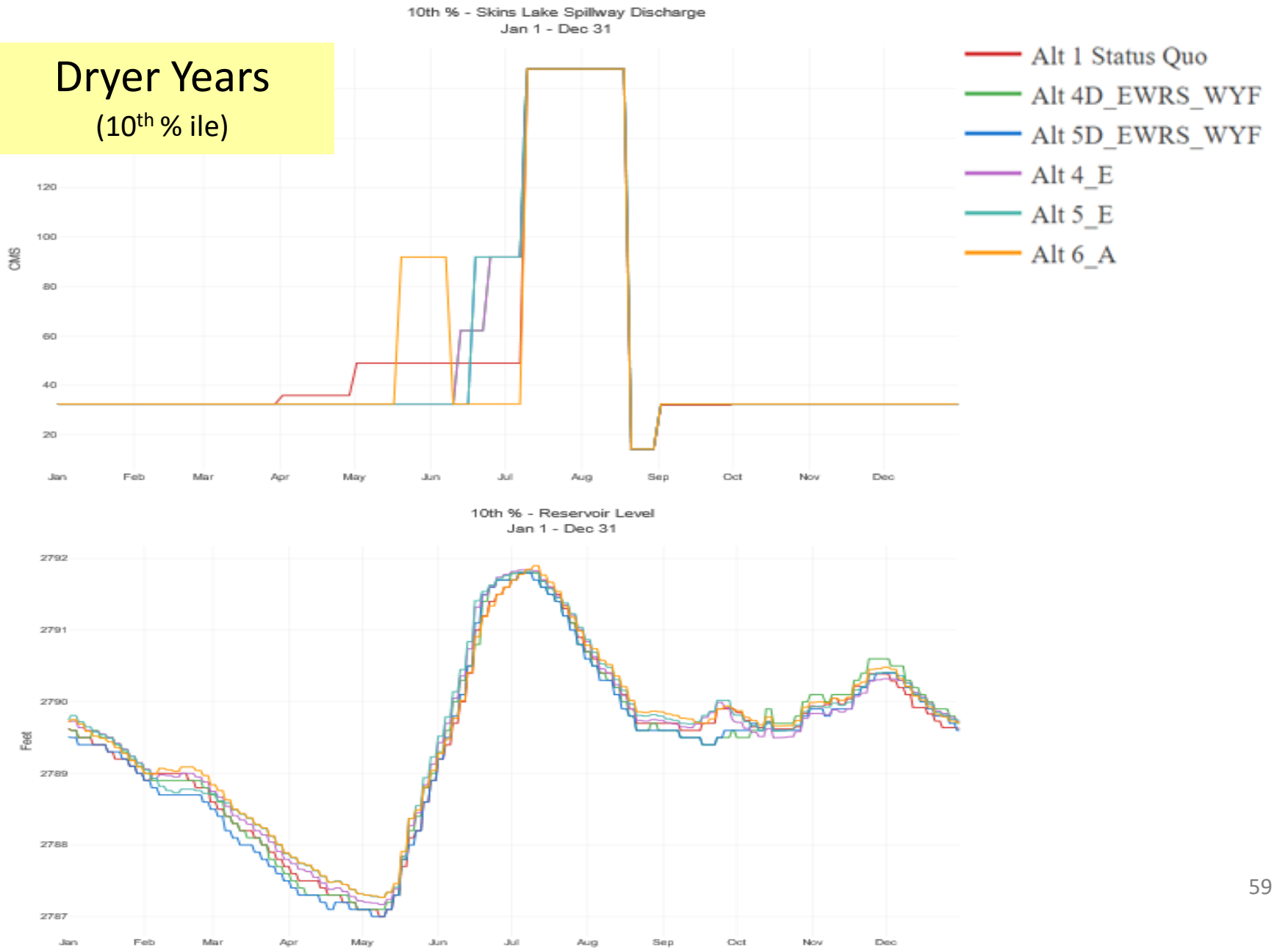



# Phase 1 Flow Alternatives

## Hydrographs

# Hydrograph Comparisons

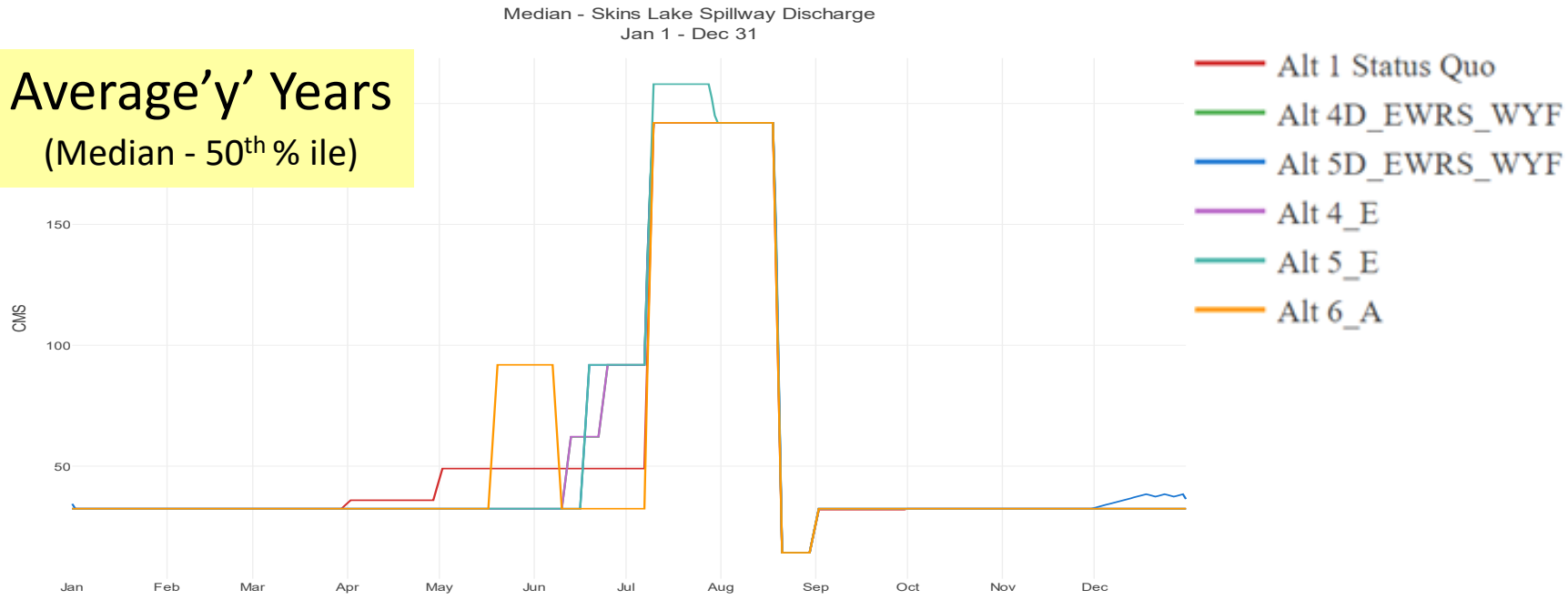
**Dryer Years**
(10th % ile)

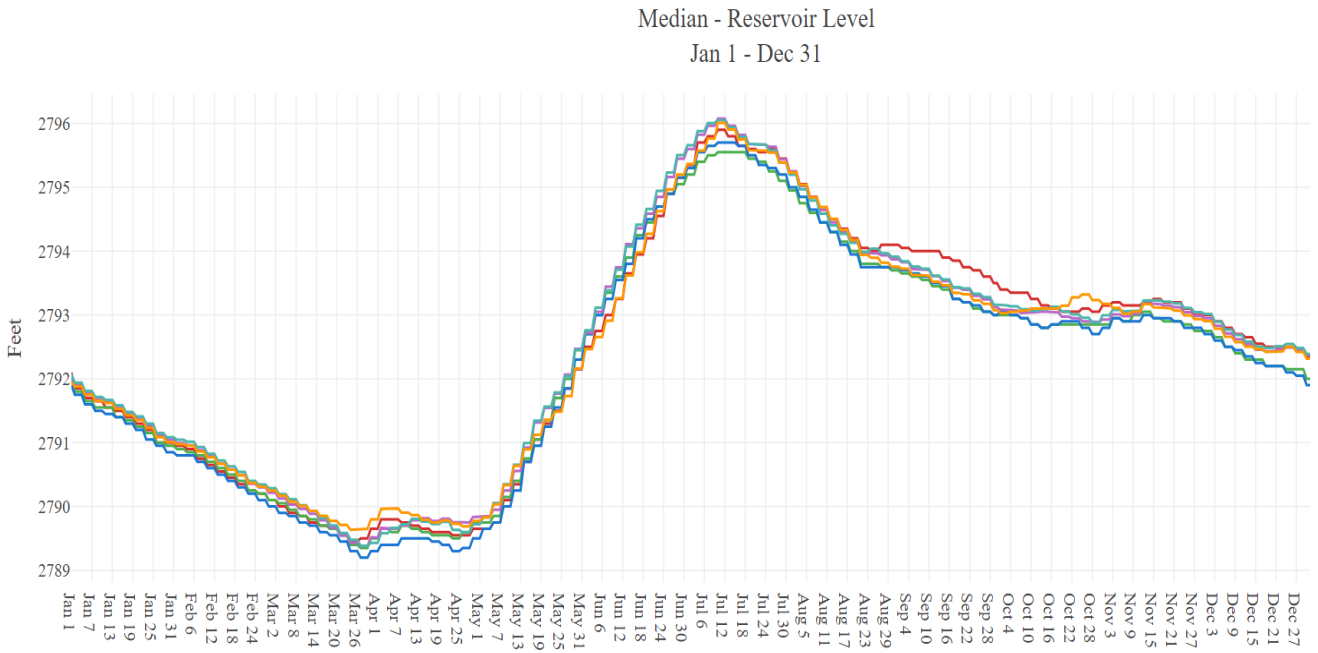


# Hydrograph Comparisons

## Average'y' Years

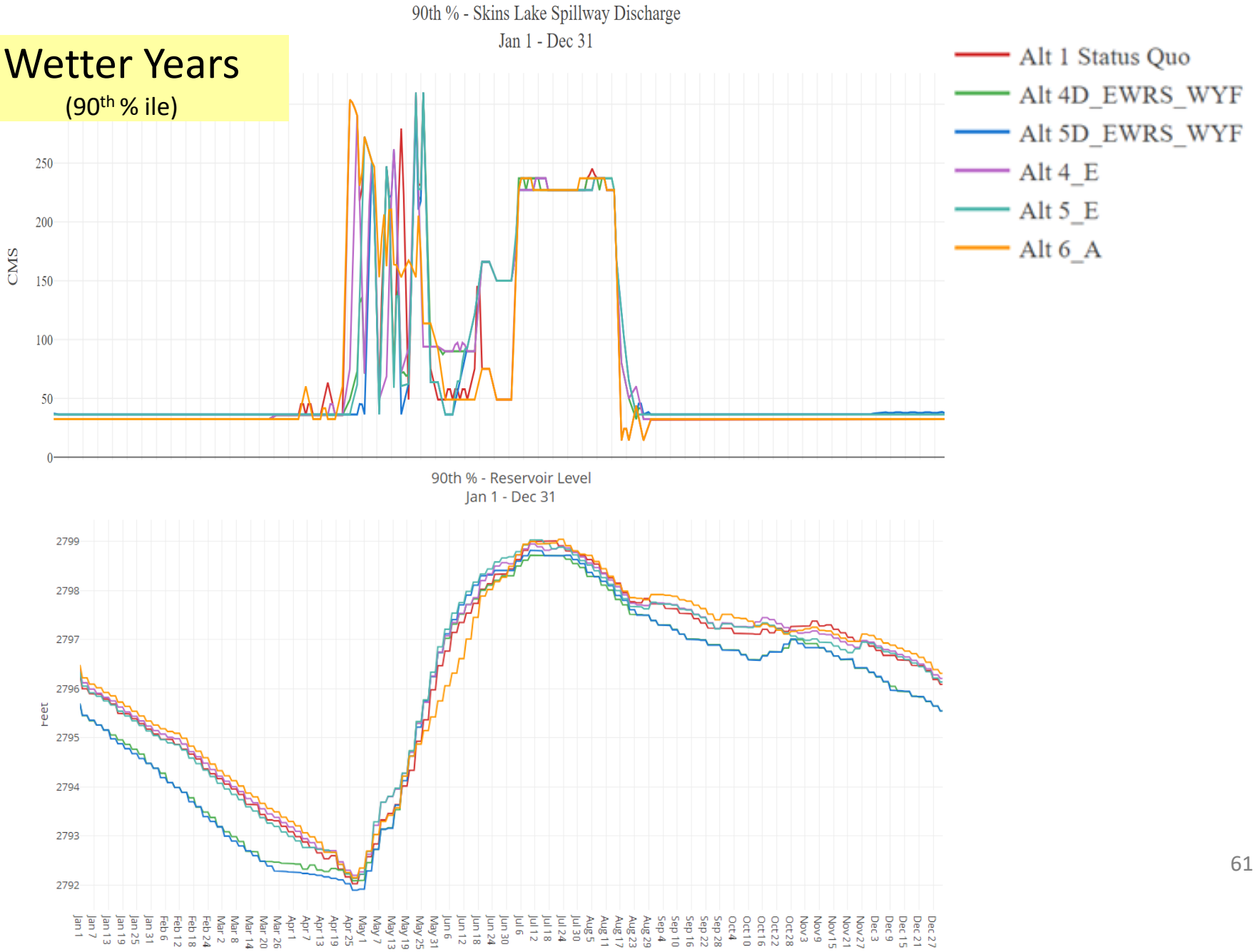
(Median - 50th % ile)



# Hydrograph Comparisons

## Wetter Years
(90th % ile)

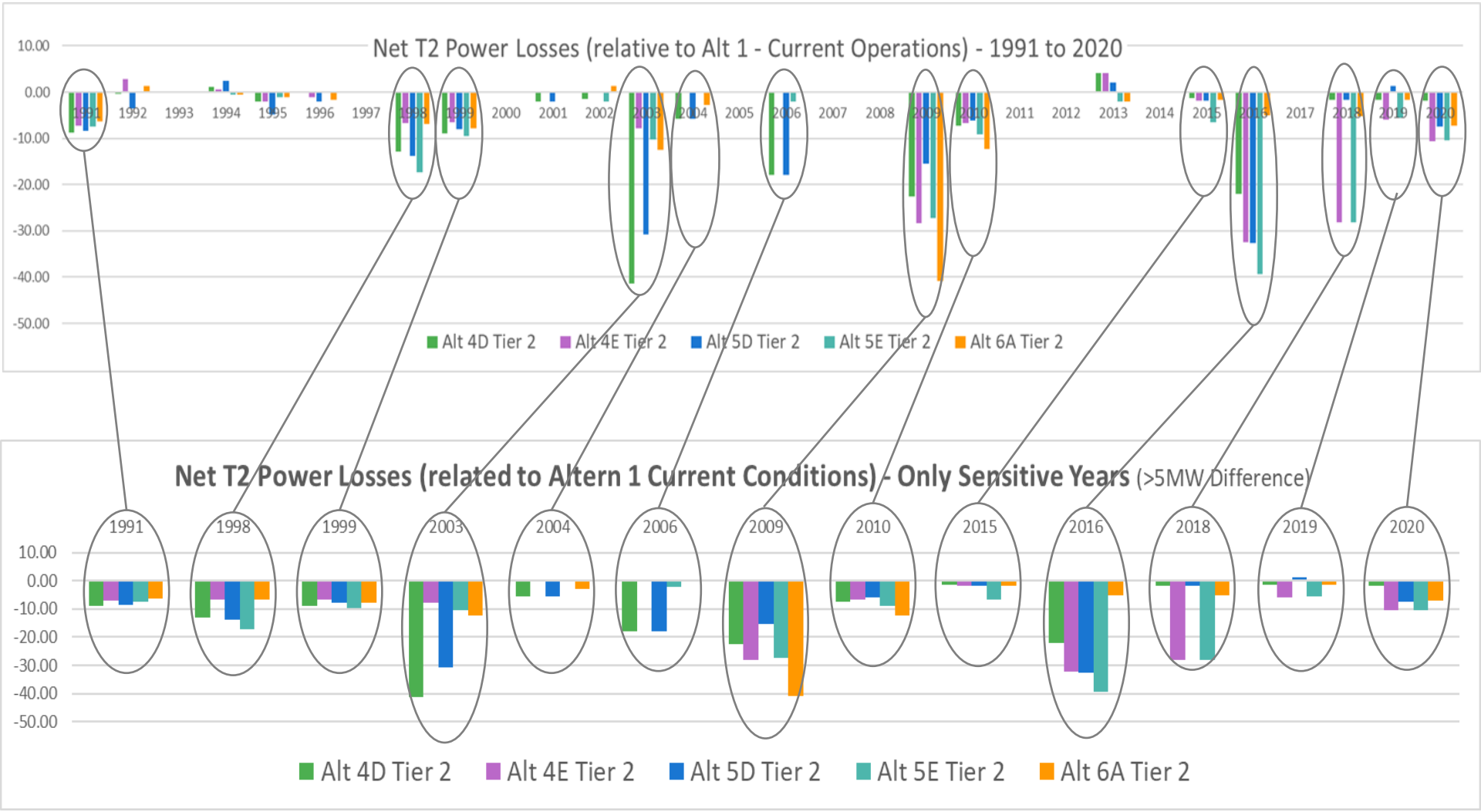


# HydroViz – Online Tool

https://www.hydroviz.ca/nechako

Access Code: NECHAKOWEI

# Tier 2 Power Generation (PM#67)



# Phase 1 Flow Alternatives

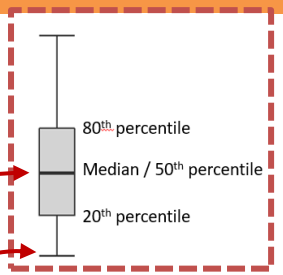
## Performance Measure

# Performance Measures

Pre-Read, Page 18

- Same 19 shortlisted PMs as last meetings:
  - 6 River fish access to side/off channels
  - 12 Reservoir productivity-flushing
  - 17 Cheslatta watershed fish habitat
  - 18a River water temperature and migrating salmon (18C)
  - 18c River water temperature and migrating salmon (20C)
  - 21a River Chinook incubation flow
  - 22a River Chinook rearing habitat
  - 25a Resident fish rearing habitat
  - 32 Reservoir caribou land links
  - 38 Reservoir osprey nesting habitat
  - 41b Reservoir wetland habitat
  - 45b River bird inundation of nests
  - 49b Cheslatta watershed inundation of archeological sites
  - 53 River open-water flooding
  - 65 Kemano power generation (smelter load)
  - 66 Kemano power exports (Tier 1)
  - 67 Kemano power exports (Tier 2)

# Consequence Table


Selected
Better than Selected
Worse than Selected
Same as Selected

| Criteria | | Performance Measures | Unit | MSIC | Alt 1 Status Quo | Alt 4D EWRS_WYF | Alt 4E | Alt 5D EWRS_WYF | Alt 5E | Alt 6A |
|---|---|---|---|---|---|---|---|---|---|---|
| **Fish** | | | | | | | | | | |
| * #6 River fish access to side/off channels | Median | Average flow | CMS | 20% | 92.6 | 99.3 | 94.2 | 98.2 | 94.2 | 94.2 |
| * #12 Reservoir productivity-flushing | Median | Average discharge | CMS | 20% | 84.9 | 92.3 | 86.8 | 90.3 | 86.8 | 86.8 |
| * #17 Cheslatta watershed fish habitat | 80th % | Range of flow | CMS | 20% | 295.8 | 234.6 | 277.6 | 233.8 | 262.9 | 238.2 |
| * #18a River water temperature and migrating salmon | Median | Number of days average daily temp exceeds 18C | Days | 20% | 30.5 | 29.5 | NA | 29.5 | NA | NA |
| * #18c River water temperature and migrating salmon | Median | Number of days average daily temp exceeds 20C | Days | 20% | 5.5 | 5 | NA | 5 | NA | NA |
| * #21a River Chinook incubation flow | Median | Ratio of min incubation flow to average spawning flow | % | 20% | 50.3 | 48.3 | 48.5 | 48.9 | 50 | 50.2 |
| * #22a V2 River CH rearing habitat post-emergent Habitat | 20th % | Percent of max available post-emergent habitat (modified Envirocon) | % | 20% | 99.4 | 100 | 100 | 100 | 100 | 95 |
| * #22b V2 River CH rearing habitat pre-migrant habitat | 20th % | Percent of max available pre-migrant habitat (modified Envirocon) | % | 20% | 76.8 | 59.1 | 62.8 | 65.1 | 64.8 | 56.6 |
| * #25a Resident fish rearing habitat | Min | Percent of maximum available juvenile Rainbow Trout habitat | % | 20% | 18.8 | 21.8 | 19.5 | 22.8 | 20.7 | 17.8 |
| #26 Resident fish overwinter habitat | Median | Percent of max available overwintering habitat (mod. Slaney et al. 1984) | % | 20% | 95.6 | 95.6 | 95.6 | 96.4 | 95.6 | 95.6 |
| **Wildlife** | | | | | | | | | | |
| * #32 Reservoir caribou land links | Median | # of days water elevation is > 852 m | Days | 20% | 8 | 6 | 11 | 7 | 12 | 8.5 |
| * #38 Reservoir osprey nesting habitat | | Number of years where reservoir elevation exceeds 852.44m | Years | 20% | 12 | 9 | 12 | 9 | 11 | 12 |
| * #41b Reservoir wetland habitat | | Number of years where reservoir elevation exceeds 852.94 m | Years | 20% | 8 | 8 | 8 | 8 | 8 | 7 |
| * #45b River bird inundation of nests | | Number of years where Cheslatta discharge exceeds 275 cms | Years | 20% | 5 | 4 | 5 | 4 | 5 | 5 |
| **Culture & Heritage** | | | | | | | | | | |
| * #49b Cheslatta watershed inundation of arch sites | Max | # of days > 300 cms | Days | 7 | 100 | 96 | 100 | 96 | 97 | 103 |
| **Flooding & Erosion** | | | | | | | | | | |
| * #53 River open-water flooding | Max | # of days flow >550 at Vanderhoof | Days | 7 | 2 | 0 | 9 | 0 | 10 | 9 |
| **Rio Tinto Operations** | | | | | | | | | | |
| * #65b Smelter Power | Max | # of days smelter load isn't met | Days | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| * #66b Kemano power reliability (Tier 1) | | Tier 1 power reliability | % | 5 | 96.98 | 96.29 | 96.98 | 95.92 | 96.98 | 97.55 |
| * #67 Kemano power exports (Tier 2) | Average | Mean Tier 2 power generation | MW | 5 | 112.8 | 107.6 | 108.2 | 107.6 | 106.8 | 109 |

# Condensed Consequence Table

[only showing PMs where there are significant differences (>MSIC)]

| Selected |
|---|
| Better than Selected |
| Worse than Selected |
| Same as Selected |

| Criteria | | Performance Measures | Unit | Preferred Direction | MSIC | Alt 1 Status Quo | Alt 4D EWRS_WYF | Alt 4E | Alt 5D EWRS_WYF | Alt 5E | Alt 6A |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fish | | | | | | | | | | | |
| * #17 Cheslatta watershed fish habitat | 80th % | Range of flow | CMS | Lower | 20% | 295.8 | 234.6 | 277.6 | 233.8 | 262.9 | 238.2 |
| * #22b V2 River CH rearing habitat pre-migrant habitat | 20th % | Percent of max available pre-migrant habitat (modified Envirocon) | % | Higher | 20% | 76.8 | 59.1 | 62.8 | 65.1 | 64.8 | 56.6 |
| * #25a Resident fish rearing habitat | Min | Percent of maximum available juvenile Rainbow Trout habitat | % | Higher | 20% | 18.8 | 21.8 | 19.5 | 22.8 | 20.7 | 17.8 |
| Wildlife | | | | | | | | | | | |
| * #32 Reservoir caribou land links | Median | # of days water elevation is > 852 m | Days | Higher | 20% | 8 | 6 | 11 | 7 | 12 | 8.5 |
| * #38 Reservoir osprey nesting habitat | | Number of years where reservoir elevation exceeds 852.44m | Years | Lower | 20% | 12 | 9 | 12 | 9 | 11 | 12 |
| * #45b River bird inundation of nests | | Number of years where Cheslatta discharge exceeds 275 cms | Years | Lower | 20% | 5 | 4 | 5 | 4 | 5 | 5 |
| Flooding & Erosion | | | | | | | | | | | |
| * #53 River open-water flooding | Max | # of days flow >550 at Vanderhoof | Days | Lower | 7 | 2 | 0 | 9 | 0 | 10 | 9 |
| Rio Tinto Operations | | | | | | | | | | | |
| * #67 Kemano power exports (Tier 2) | Average | Mean Tier 2 power generation | MW | Higher | 5 | 112.8 | 107.6 | 108.2 | 107.6 | 106.8 | 109 |

# Condensed Consequence Table

[only showing PMs where there are significant differences (>MSIC)]

| Selected |
| --- |
| Better than Selected |
| Worse than Selected |
| Same as Selected |

| Criteria | | Performance Measures | Unit | Preferred Direction | MSIC | Alt 1 Status Quo | Alt 4D EWRS_WYF | Alt 4E | Alt 5D EWRS_WYF | Alt 5E | Alt 6A |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fish | | | | | | | | | | | |
| * #17 Cheslatta watershed fish habitat | 80th % | Range of flow | CMS | Lower | 20% | 295.8 | 234.6 | 277.6 | 233.8 | 262.9 | 238.2 |
| * #22b V2 River CH rearing habitat pre-migrant habitat | 20th % | Percent of max available pre-migrant habitat (modified Envirocon) | % | Higher | 20% | 76.8 | 59.1 | 62.8 | 65.1 | 64.8 | 56.6 |
| * #25a Resident fish rearing habitat | Min | Percent of maximum available juvenile Rainbow Trout habitat | % | Higher | 20% | 18.8 | 21.8 | 19.5 | 22.8 | 20.7 | 17.8 |
| Wildlife | | | | | | | | | | | |
| * #32 Reservoir caribou land links | Median | # of days water elevation is > 852 m | Days | Higher | 20% | 8 | 6 | 11 | 7 | 12 | 8.5 |
| * #38 Reservoir osprey nesting habitat | | Number of years where reservoir elevation exceeds 852.44m | Years | Lower | 20% | 12 | 9 | 12 | 9 | 11 | 12 |
| * #45b River bird inundation of nests | | Number of years where Cheslatta discharge exceeds 275 cms | Years | Lower | 20% | 5 | 4 | 5 | 4 | 5 | 5 |
| Flooding & Erosion | | | | | | | | | | | |
| * #53 River open-water flooding | Max | # of days flow >550 at Vanderhoof | Days | Lower | 7 | 2 | 0 | 9 | 0 | 10 | 9 |
| Rio Tinto Operations | | | | | | | | | | | |
| * #67 Kemano power exports (Tier 2) | Average | Mean Tier 2 power generation | MW | Higher | 5 | 112.8 | 107.6 | 108.2 | 107.6 | 106.8 | 109 |

# AltaViz – Online Tool

https://www.altaviz.ca/public/220db3fc-2aa8-4eea-9dd1-e3a26c4bb97a

Access Code: NECHAKOWEI

# Phase 1 Flow Alternatives

## Commentary

# Commentary

| | |
|---|---|
| **Alt 1** Status Quo | **Alternative 1 Status Quo** performs well for Tier 2 power generation and river open-water flooding, but does not perform well for reservoir osprey nesting habitat. For fish habitat, there is no significant difference between alternatives under median conditions. |
| **Alt 4D** | **Alternative 4D** (multi-step flow increase leading to STMP during wet years, smaller magnitude stepped increase during dry/typical years) performs well for reservoir osprey nesting habitat, river bird nests, and river open-water flooding. It does not perform well for caribou land links and does not perform as well as the status quo for Tier 2 power. |
| ***New*** **Alt 4E** | **Alternative 4E** (same flow release schedule as **Alternative 4D**, with redefined wet years) performs well for reservoir caribou land links, but did not perform well for reservoir osprey nesting habitat and river open-water flooding. Tier 2 power generation for **Alternative 4E** does not differ significantly from the status quo |
| **Alt 5D** | **Alternative 5D** (single step increase leading to STMP during wet years, smaller magnitude increase during dry/typical years) performs well for reservoir osprey nesting, river bird nest inundation, and river open-water flooding. **Alternative 5D** does not perform well for reservoir caribou land links and does not perform as well as the status quo for Tier 2 power generation. |

# Commentary

| | |
|---|---|
| ***New* Alt 5E** | **Alternative 5E** performs well for reservoir caribou land links, but does not perform well for river open-water flooding, and does not perform as well as the status quo for Tier 2 power generation. |
| ***New* Alt 6A** | **Alternative 6A** (multi-step increase during freshet in wet years, single-step, smaller magnitude increase during dry/typical years) does not perform substantially better than other alternatives for any PM. It performs worse than some other alternatives for reservoir osprey nesting and flooding. Tier 2 power generation for **Alternative 6** does not differ significantly from the status quo. |
| **General** | The revisions between **Alternative 4D/5D** and **Alternative 4E/5E** had a small effect (either positive or negative) on Tier 2 power generation, but the new alternatives generally did not perform as well for other PMs (particularly with respect to flooding). However, the selection of years for additional flow release under **Alternative 4D** and **5D** were based on foresight and not operationalized (i.e., cannot be implemented reliably). Therefore, comparison of alternatives to put into practice should be limited to status quo (**Alternative 1**), Alternative **4E**, **Alternative 5E**, and **Alternative 6**. For fish habitat performance measures, there is no significant difference in the median values, however, there are differences between alternatives in specific years (i.e., minimum, 20th or 80th percentile) for some PMs (e.g., Cheslatta watershed fish habitat, Chinook pre-migrant and resident juvenile rearing habitat). |

# Phase 1 Flow Alternatives

## Identifying a Preferred Alternative

# Phase 1 Flow Alternatives

## Exercise: Identifying Support

"Is there a Flow Alternative that is better than Rio Tinto's current operations (Alt 1) to be implemented on an interim basis until the selection of a Phase 2 or Phase 3 flow option with more benefits?"

# Exercise

## Gauging Agreement

Main Table members are asked to indicate their level of support for each of each Phase 1 Flow Alternatives, according to:

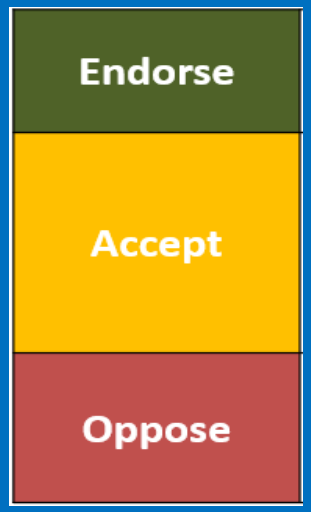
| | |
|---|---|
| **Endorse** | **I fully endorse this alternative;** it meets my expectations and interests over the short term (i.e., as a Phase 1 Flow Altern) |
| **Accept** | **I can accept this alternative**; there may be some aspects that I am not happy about or have reservations about (which my support may be contingent on]; but generally could live with it AND be willing to support it over the short term (i.e., as a Phase 1 Flow Alternative) |
| **Oppose** | **I cannot support this alternative at this time**; because… *(please specify)* |

# Exercise

## Gauging Agreement

| Alternative | Level of Support | Conditions / Comments |
|---|---|---|
| ALT 1 – Status Quo | | |
| ALT 4D | | |
| ALT 5D | | |
| ALT 4E | | |
| ALT 5E | | |
| ALT 6A | | |
| | | |

**Choose either:**

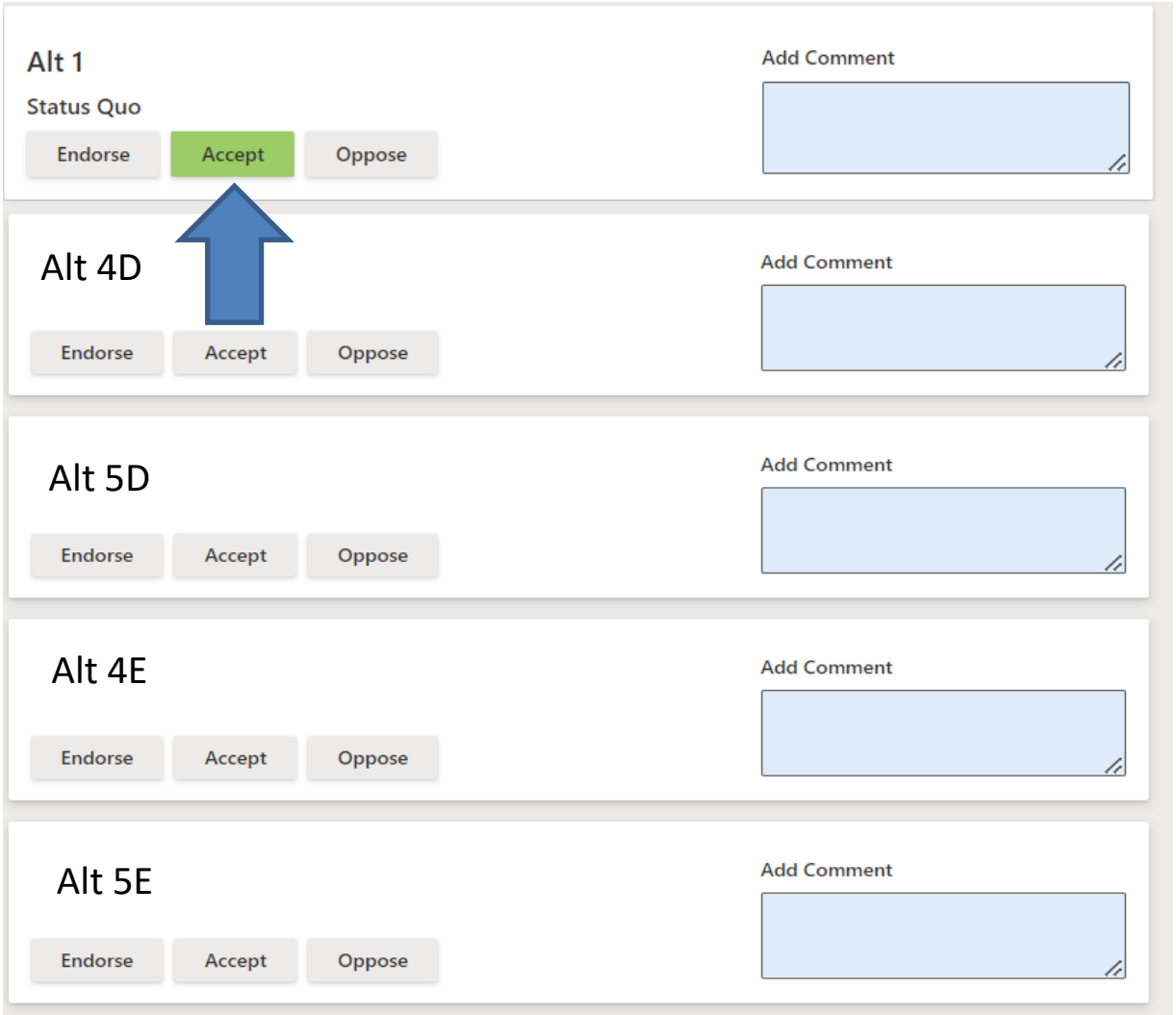



**Describe any conditions**

*If you oppose an alternative or have any significant conditions to enable your support, please describe why?*

# Exercise (on-line AltaViz)

## Gauging Agreement



# Exercise 2
## Gauging Support

Please fill out survey form

# Phase 1 Non - Flow Alternatives

## Building a Package

# Refresher from last meeting

**Building a Package for Phase 1**

- Project Team reviewed a series of potential options and recommendations to be included in Phase 1 (beyond a Flow Altern recommendation)
- Project Team was directed to go away and further work with the TWG to develop a package for the Main Table to review
- TWG has met a number of time to discuss datagaps and priorities related to monitoring research, physical works and other implementation considerations.
- Project Team has suggested a priority list of actions to undertake for each category, as summarized in the pre-reading package

# TWG Update: Data Gaps

- ✓ PM data gaps
- ✓ Baseline ecological data gaps
- ✓Determine if Tier-2 loss can be mitigated when operationalized
- ✓Physical works
- ✓ Effects Monitoring

# Package of Recommendations for Phase 1


| Phase 1 **Flow Alternatives** | Phase 1 **PM Datagaps** (for P2&P3) | Phase 1 **Ecol. Baseline Datagaps** | Phase 1 **Physical Works** | Phase 1 **Effects Monitoring** | Phase 1 **Review Period** | Phase 1 **Triggers** |
|---|---|---|---|---|---|---|
| **Alt 1** Status Quo | none | none | none | none | none | none |
| **Alt 4D** EWRS_WYF (11/30) | | River Reed Canary Grass (#5) - fish stranding assment | Bank Erosion - project(s) | Reservoir Elevation | after 2 yrs | White Sturgeon Recovery |
| **Alt 5D** EWRS_WYF (11/30) | River Side Channel PM (#6) | River Fish (#6) - side channel habitat assmnt | Cheslatta Fish - project(s) | River Discharge | after 5 yrs | Unintended Popln Level Effects |
| ***New* Alt 4E** Hybrid 4D (8/30) | River Riparian Habitat PM (#7) | River Productivity (#9) - field surveys | Flooding - project(s) | River Elevation | etc. | etc. |
| ***New* Alt 5E** Hybrid 5D (8/30) | | Reservoir Productivity (#12) - Limnology surveys | Osprey & Cormorants - project(s) | River Temperature | | |
| ***New* Alt 6A** Hybrid 4E - Wet Yr Freshet Pulse | Reservoir Fish Habitat PM (#14) | Reservoir Fish Habitat (#14) - benthos & popln distri | Reservoir Fish - project(s) | Power Output | | |
| | Cheslatta Fish PM (#17) | Cheslatta Fish Habitat (#17) - Baseline Distr + Abundance | River Fish / Salmon - project(s) | | | |
| | Salmon Temp-Migration PM (#18) | River Temp & Migration (#18) - Fish Habitat + Fate Assmnt | Sediment Transport - project(s) | | | |
| | Juvenile Survival PM (#19) | River Temp & Juveniles (#19) - Habitat Use + Fate Assmnt | Ungulates - project(s) | | | |
| | Chinook Rearing PM (#22) | Chinook Winter Habitat (#23) - Habitat Assmnt | Waterfowl/Shore Nesting Birds - project(s) | | | |
| | Resident Fish Rearing PM (same as PM #18) | Resident Fish Temp (#24) - Field & Temp Study | Wildlife Habitat - project(s) | | | |
| | | Resident Fish Rearing Habitat (#25) - Field & Habitat Study | | | | |
| | | River Mussels (#27) - field assmnt | | | | |
| | White Sturgeon PMs (#28, 29, 30) | White Sturgeon (#28, 29, 30) | | | | |
| | Archaelogy Site Erosion PM (#49) | Reservoir Osprey Food Avail (#39) - fish popln distr, abund, hab use | | | | |
| | River Ice PM (#68) | River Ice Cover (#68) - field survey | | | | |

# Phase 1 Non - Flow Alternatives

## Project Team's Recommended Datagaps

# Project Team's Recommended Phase 1 Datagaps


## Refer to Table in Pre-reading package

| Issue information | | | Study description(s) | Relative Cost $ < $50k $$ = $50k-$250k $$$ > $250k | Priority Level (Low, Moderate, High) | |
|---|---|---|---|---|---|---|
| # | Name | Basin | | | Ecological Baseline | PM |
| 5 | River Reed Canary Grass - Fish stranding | Nechako River | Field assessment to determine Reed Canary Grass distribution during growing season. | $ | High | |
| | | | Fish stranding assessment / experiment. | $$ | High | |
| 6 | River fish side channel habitat | Nechako River | HEC-RAS DEM to determine side channel depth over range of Nechako River flows. | $ | | High |
| | | | Field assessment of wetted area. | $ | High | High |
| | | | Habitat function flow relationship for side channels. | $$ - $$$ | High | High |
| 7 | River functional riparian habitat | Nechako River | HEC-RAS DEM to determine timing and duration of riparian habitat inundation over range of Nechako River flows. | $ | | High |
| 8 | River Reed Canary Grass - Invasive species/habitat impacts | Nechako River | Field assessment to determine Reed Canary Grass distribution during the growing season. | $ - $$ | High | |
| | | | Field assessment of Reed Canary Grass impacts on native habitats/species. | $$$ | High | |
| 9 | River productivity | Nechako River | Field surveys to further characterize existing conditions. | $$ | High | |
| 11 | Reservoir productivity-growth | Nechako Reservoir | Limnology surveys (secchi, nutrients, chlorophyl A, alkalinity, TDS) macrophyte, periphyton observations, substrate type. | $$ | High | |
| | | | Data to update bathymetry model. | $$ - $$$ | | High |
| 13 | Reservoir fish habitat | Nechako Reservoir | Data to update bathymetry model. | $$ - $$$ | | High |
| | | | Contemporary benthos and zooplankton density data during entire growing season including biomass from length mass regressions. | $$ | High | |
| | | | Fish population distribution and habitat/use assessment. | $$$ | High | |

**Main Table members were asked to review the recommended list of high priority datagaps and identify whether there are any datagaps missing that they think are important and need to be addressed in Phase 1; and if there are some, please be prepared to describe your reasoning for including them.**

# Phase 1 Non - Flow Alternatives

## Project Team's Recommended Physical Works

# Project Team's Recommended Physical Works


- There are many potential physical works projects that could be undertaken in Phase 1
- All of which would provide value if they were built
- TWG reviewed the preliminary list developed by the Project Team
- The Project Team's prioritization approach was to focus on candidate projects based on their relationship to,
  - Water management and Rio Tinto's ongoing operations
  - An increased risk of a negative impact based on differences in the performance measure values across the current Phase 1 Flow Alternatives
  - Therefore, the recommended list provides an opportunity to mitigate or offset an increased risk of an adverse impact between a preferred flow alternative and current operations (Alt 1)

# Project Team's Recommended Physical Works


## Refer to Table in Pre-reading package

| PM # | PM Theme | Goal | Candidate Physical Works Project(s) | Location | Potential Site | Relative Cost<br>Low $0-50k<br>Mod $50k-250k<br>High > $250k |
|---|---|---|---|---|---|---|
| **PM#17** | Cheslatta fish, River fish, Salmon | Improved mainstem fish habitat quality. | In-stream woody debris structures. | Nechako River, Cheslatta watershed | To be determined (TBD) | $$ - $$$ |
| **PM#22b PM#25b** | River fish, Salmon | Improved side channel fish habitat quality. | Scarification channels. | Nechako River | TBD | $$ |
| | | | Woody debris/fish habitat complexing. | Nechako River | TBD | $ - $$ |
| | | Improved side channel fish habitat access. | Excavate side channel inlets. | Nechako River | TBD | $$ |
| **PM#32** | Ungulates | Reduce wolf predation on caribou calves. | Dredge land bridges between known caribou calving islands. | Nechako Reservoir | Whitesail Reach | $$ - $$$ |
| **No PM** | Ungulates | Improved caribou access to calving islands | Remove large woody debris (LWD) accumulations along calving island shorelines | Nechako Reservoir | Whitesail Reach | $$ |
| **PM#38** | Osprey & Cormorants | Reduced osprey nest flooding. | At risk nest relocation. | Nechako Reservoir | Primarily Ootsa Lake | $ |
| | | | Removal of at risk nesting sites (i.e., tree removal). | Nechako Reservoir | Primarily Ootsa Lake | $ |
| **PM#53** | Flooding | Reduce / offset any increased open water flooding risk | Example, funding towards DOV planned dyke. | Nechako River | Vanderhoof | $$$ |

Main Table members were asked to review the proposed shortlist of candidate physical works projects recommended by the Project Team as a menu to be used to mitigate / offset some increased risks of negative effects, provide addn benefits or avoid some studies. If members have recommendations for additional physical works projects to be included in Phase 1, please be prepared to describe your reasoning for including them.

# Phase 1 Non - Flow Alternatives

## Recommended Effectiveness Monitoring

# Recommended Effectiveness Monitoring


- The Project Team has discussed various monitoring options with the TWG as to whether the effectiveness and benefits of a new Flow Alternative could be measured within the timeframe and duration of a flow change implemented in Phase 1. A number of factors weighed into these discussions, including:
  - Expected change/effect under flow alternative (i.e., Consequence table suggests most PMs will not be affected, and where effects anticipated magnitude is small).
  - Lessons learned (WUP process, U.S. Missouri River Pallid Sturgeon, BC Hydro IPP process, other projects)
  - Standard monitoring protocols
  - Monitoring timeframes (including baseline)
  - WEI timeframes (Phase 2/3)
  - PM certainty

# Recommended Effectiveness Monitoring


- The recommended effectiveness monitoring consists of,
  - reservoir elevation,
  - river discharge,
  - river elevation,
  - river temperature,
  - power output

**Note:** These things to be monitored relate to the PMs, which are currently already being calculated and all of these are already being monitored (i.e., no new infrastructure or instrumentation needed to monitor these things).

# Phase 1 Non - Flow Alternatives

## Other Implementation Recommendations

# Other Implementation Recommendations


| Area | Description and Recommendation |
|---|---|
| **Formal Review** | It is fairly common for a new flow regime (alternative) to have a set and formal review built into its operational plan. There are many reasons for this, but the most common is to review and revisit whether the flow alternative is meeting the expected benefits and/or not having any unacceptable unintended consequences. A key factor in when to stage a formal review is when there will be better information and monitoring in order to carry out a comprehensive review.<br><br>It is a bit complicated to set the appropriate timing of a formal review on a Phase 1 Flow Alternative that is only meant to be interim until there is a new Phase 2 or Phase 3 flow alternative. However, we do not know the exact timing for when a Phase 2/3 flow change could occur, as there will be uncertainty with it as a result of regulatory approvals and possible environmental assessments that may be required. So for insurance, the **Project Team is recommending that a formal review of the Phase 1 Flow Atlernative be carried out after five years** from when it gets implemented. This assumes that the recommended Phase 1 datagaps will have been completed to better ensure better information is available to carry out the review. |

# Other Implementation Recommendations


| Area | Description and Recommendation |
|---|---|
| **Triggers** | A recommendation to proceed with a new Phase 1 Flow Alternative is associated with uncertainty, as our current understanding is imperfect. And we know that there are some primary concerns that if we had a better information base and understanding, we may have led to a different Phase 1 Flow Alternative outcome, but we used the best information we had at hand. One obvious trigger that has been discussed and agreed to earlier (NWEI Sturgeon Strategy) is that if the White Sturgeon Recovery Team recommends flow changes to better recover sturgeon that this would automatically trigger a re-opening and review of the Phase 1 Flow Alternative (assuming that it was still operating).<br><br>**The Project Team recommends two specific triggers that would led to a review and revisiting of the Phase 1 Flow Alternative, as follows:**<br>• **If the White Sturgeon Recovery Team recommends a new base flow regime.**<br>• **If it is determined that the Phase 1 Flow Alternative is having an adverse population-level affect on priority fish species.** |

# Other Implementation Recommendations


| Area | Description and Recommendation |
|---|---|
| **Operational Updates and Engagement** | Rio Tinto implemented a new approach to engage external parties and communities, provide operational updates and seek structured feedback into their operations through the NWEI process and Main Table. **The Project Team wanted to check whether there was a recommendation from the Main Table on this approach and whether it should continue after the planning phases and into the implementation of a recommended Flow Alternative**.<br><br>The current approach includes regular meetings through the NWEI Main Table, Southside Working Group, Technical Working Group, website and communications materials to the broader public along with the regular updates to the Community Leaders Forum. These updates and briefings provide a window to keep interested parties updates on annual and in-season operational planning as well as providing an opportunity to seek input and direction. |

# Other Implementation Recommendations


| Area | Description and Recommendation |
|---|---|
| **Phase 1 Studies & Physical Works Project Manager / Coordinator** | The further refinement and scoping of the recommended datagap studies and physical works with the TWG along with the project management and coordination to get the studies / projects funded and built will require effort and a high degree of effort and coordination across all the agencies and partners in the watershed.<br><br>**The Project Team is therefore recommending that a full time Phase 1 Coordinator / Manager be hired to support this work**. |
| **Other** | **Are there other recommendations that the Main Table would like to discuss and possibly include within the package of Phase 1 Recommendations? If so, please come to the meeting with your ideas.** |