

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

May 15, 2019

DRAFT Facilitator's Summary

Facilitator: Emily Stranz; Notes: Colby Mills, DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions, and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members. Official minutes can be found on the TMT website: <http://www.nwdwc.usace.army.mil/tmt/agendas/2019/>.

Review Meeting Minutes & Facilitator's Summaries

TMT members requested more time to review and submit edits to the 12/19 (YER), 4/24, 5/1, 5/8, and 5/10 summaries. They will be revisited at the next face-to-face meeting on May 29.

Dworshak Operations

Steve Hall, Corps, provided the TMT with an update on current operations at Dworshak Dam. Forebay elevation was 1,578 feet, with inflows around 18-19 kcfs and 2.9 kcfs outflow (including 700 cfs spill). The Northwest River Forecast Center is showing a high amount of precipitation and inflows coming into the Clearwater Basin. The current 10-day forecast shows Friday and Saturday with areas of 1-2 inches of precipitation per day, which could potentially drive inflows to Dworshak up to 45 kcfs. Only one year out of 44 years of record keeping has exceeded 45 kcfs in the month of May (1997); the Corps will be watching this forecast closely as it will affect spill at the project.

Forecasts show that Clearwater River at Orofino is expected to come up again, with a peak above bank-full on May 18 & 19, but not quite to flood level. The basin-wide storm extends down into the Salmon River and north of the Clearwater as well. The 10-day QPF shows about 3 inches of precipitation within a couple days.

Operational scenarios have been updated to reflect the anticipated change in the forecast (as compared to Monday's forecast). Steve noted a data error for the rule curve line in the first graph, which will be fixed. Scenarios showed relatively low inflows for the month of May, however the project will have to spill quite a bit if it reaches peak inflows of 45 kcfs. The incoming precipitation is causing uncertainty around monthly average inflow.

To manage the reservoir, the project added 700 cfs of spill at midnight last night, and did not exceed 100% TDG, so will continue at least at that level through May 17 when unit 2 comes back online. With upwards of 40 kcfs inflows, it does drive the project to nearly full, which puts pressure on the flood control requirement based on remaining snow-covered areas. As of last night there was an estimated 40% snow-covered area, which according to the water control manual means that the project needs to be below elevation 1587.5 ft (about 13 ft below full). The snow-covered area criteria will be the controlling limit moving forward and operations will depend on actual inflows. The plan is to minimize spill and thus gas as long as possible, however, the Corps will have to spill as necessary to keep the reservoir at a safe level.

Unit Outages

Unit 2 is currently out and expected to come back on May 17 at 1700 hours. Unit 3 is out through the end of May 24, and the expectation based on progress is they will need the full outage. The unit will get some run time during that outage as they do need to pass water through the unit during testing.

Jay Hesse, Nez Perce, noted the Tribe's concern that TDG levels can affect fish in Dworshak hatchery as well as downstream, and their desire is to do everything possible to keep gas levels at or below 100% to minimize stress on fish. Jay updated the TMT that Dworshak Hatchery will receive fish from Lyon's

Ferry hatchery next week due to water source and repair maintenance issues, meaning extra fish will potentially be in harm’s way if TDG levels get too high. The hatchery’s ability to de-gas water received downstream from Dworshak is roughly from 105% down to 102%, and from 110% to 103%, so if at all possible they would prefer to keep spill level for 100% TDG, while understanding there is uncertainty in the forecasts. Jay suggested pushing some flow back to the later part of June if possible.

SOR Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows

Jason Flory, USFWS, presented a Special Operations Request (SOR) from US Fish & Wildlife Service regarding 2019 Libby Dam releases for sturgeon and bull trout augmentation flows (SOR posted on TMT website). The objective of the operation is to provide and maximize the duration of peak river stages/flows during the spring run-off period; with the goal of providing conditions that will enable sturgeon to migrate to, and spawn over, rocky substrates that exist upstream of Bonners Ferry. They were hoping to repeat last year’s successful operations, but due to temperatures and low snowpack, there isn’t a lot of snowmelt runoff to work with.

He noted that they will take the same approach as in 2018 and focus on stretching the duration of the peak out longer, using volume to make the pulse as long as possible. The plan is to release 20,000 cfs out of Libby dam and hold for about 22 days, then ramp back down to summer BiOp flows.

Logan Osgood-Zimmerman, Corps Seattle, summarized what operations look like now at Libby Dam (Agenda Item 4b on the TMT website), and expanded on the sturgeon operations for the SOR. The official water supply forecast for May reflects an April through August runoff forecast at Libby of 4.98 MAF, or 85% of average. That forecast sets the turgeon volume at 0.8 MAF and the bull trout minimum flow to 7 kcfs, which will be the outflow for much of the summer. The project is currently on the VarQ flow of 18 kcfs and will hold that until starting the sturgeon pulse around May 29, or whenever the runoff occurs.

TMT Member Poll for SOR: FWS #1

BOR	Support
BPA	Support
Colville Tribe	Support
COE	Support
Idaho	Support
Kootenai Tribe	<i>Absent</i>
Montana	Support <i>(Contacted by Corps after the meeting)</i>
Nez Perce Tribe	Support
NOAA	Support
Oregon	Support
Spokane Tribe	<i>Absent</i>
Umatilla Tribe	Support
USFWS	Support
Warm Springs Tribe	<i>Absent</i>
Washington	Support

FOP Spring Spill

Dan Turner, Corps, reported that Snake River projects continue to operate to the flex spill agreement to meet but not exceed 120% TDG. There was a slight bump over at Lower Monumental Dam, and Dan noted the natural variability of the system means that plus or minus 1% is typical. In regards to the Columbia River, at the TMT call on Friday May 10, the group polled and agreed (with OR abstaining) to manage John Day and The Dalles in tandem to meet three different goals:

1. 120% TDG in The Dalles tailwater
2. Spill cap of greater than or equal to 40% at The Dalles
3. 120% TDG in the John Day tailwater, if possible.

Dan noted that at times, the Corps is not able to meet all three goals, and when needed will prioritize the first 2 goals. On Friday the Corps reduced the John Day spill cap in reaction to the high 121% in The Dalles tailwater. Wind has picked up and temperatures decreased, so both John Day and The Dalles tailwaters are now at 119%. In response, the Corps is increasing the John Day spill cap. Dan stressed that these projects, especially The Dalles, are extremely sensitive to changing environmental conditions. Also, with inflow forecasts coming up, some projects are likely go into involuntary spill on Friday, May 17, and TDG may exceed 120%. Russ Kiefer, ID, noted that the agreement made on Friday is accomplishing what the group envisioned, and appreciated the group's adaptive management change.

Tony Norris, BPA, reported flexing at all projects except The Dalles (both the spill cap and performance standard are the same at 40%), and things are going smoothly.

Operations Review

Reservoirs: Eric Rothwell, BOR, reported on Bureau of Reclamation projects:

- **Hungry Horse:** midnight elevation was 3,536 feet, with average outflows of 5.5 kcfs, and inflows of 18 kcfs. The project may adjust next week for refill.
- **Grand Coulee:** midnight elevation was 1,273 feet, with average outflows of 130 kcfs, and inflows a little higher.

Lisa Wright, Corps, reported on Corps of Engineers projects:

- **Libby:** midnight elevation was 2,411.6 feet, with average inflows of 31.4 kcfs and outflows of 17.1 kcfs;
- **Albeni Falls:** midnight elevation of 2,057.4 feet, with average inflows of 57.6 kcfs and outflows of 49.3 kcfs;
- **Dworshak:** midnight elevation of 1,577.4 feet, with average inflows of 18.2 kcfs and outflows of 2.2 kcfs;
- **Lower Granite:** average outflows of 126.8 kcfs;
- **McNary:** average outflows of 294.5 kcfs; and
- **Bonneville:** average outflows of 308 kcfs.

Water Quality: Dan had nothing further to report.

Fish: Paul Wagner, NOAA, reported that adult fish counts are picking up, although not at a desired rate. Adult spring Chinook at Bonneville are passing steadily in the 1,000-2,000 range weekly, with 39,681 total to date, or about 35% of the 10-year average, and 2,753 jack Chinook, or 22% of the 10-year average. He noted that there is still time left, and that last year there was a rally late in the season. 1,219 jack Chinook have passed Lower Granite, which is about 6% of the 10-year average. All projects are reflecting adult passage well below the 10-year average, but Paul noted that fish are late in arriving at projects so it's challenging to make a perfect comparison. Russ added that based off the number of PIT tagged Snake River sockeye passing Bonneville, fishery managers in Idaho are concerned that not enough will return to the hatchery to meet broodstock needs. This issue will be reevaluated after May 22.

In regards to juveniles, Paul reported that the Salmon River trap has been taken out for the season due to high flows, while other projects continue to collect fish, yearling Chinook in particular. Fish continue to show in reasonable numbers at the various collector projects, with Bonneville getting a bump yesterday with a passage index of 70,000.

Sub-yearling Chinook have been released in the Snake River from various hatcheries and are showing up in the passage indices. Prior to that mostly fry were showing at the projects. Bonneville had big numbers for a few days with the Spring Creek Hatchery release, and then numbers tapered off. Numbers are fewer for steelhead as so many have passed already, but overall good passage at all projects down the river. Sockeye are starting to show at Lower Granite and lower river projects along the Snake River, and reflect both natural and hatchery releases. Lamprey continue to show at Lower Monumental, McNary and all the way down the river. Steelhead are showing strong passage at all the projects in terms of both magnitude and timing relative to the 10-year average, while spring yearling Chinook follow the trend of an early bump, and sockeye have just started passing, with Rock Island and Bonneville seeing action.

Russ added that efforts to address the water chemistry issues at Springfield Hatchery appear successful, and that sockeye smolt should be in good condition and have a good out-migration this year. The releases started on May 7 and continued through May 9.

Power System: Tony noted that conditions have been windy, with lots of wind generation on the system.

The next scheduled TMT meeting is a call on May 22, 2019, at 9:00 AM.

This summary is respectfully submitted by the DS Consulting Facilitation Team. Suggested edits are welcome and can be sent to Colby at colby@dsconsult.co.

Columbia River Regional Forum
Technical Management Team OFFICIAL MINUTES
May 15, 2019
Minutes: Melissa Haskin, FLUX Resources

1. Welcome and Introductions

Today’s TMT meeting was chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of today’s attendees.

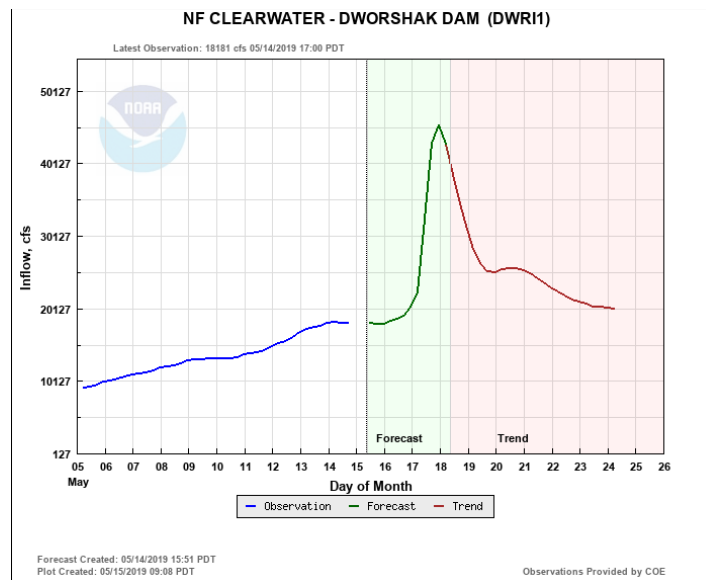
2. Minutes

Minutes for 12/19 (year-end review), April 24, May 1, May 8, and May 10 were deferred until the next in-person TMT meeting on May 29.

3. Dworshak Operations – Steve Hall, Corps NWW

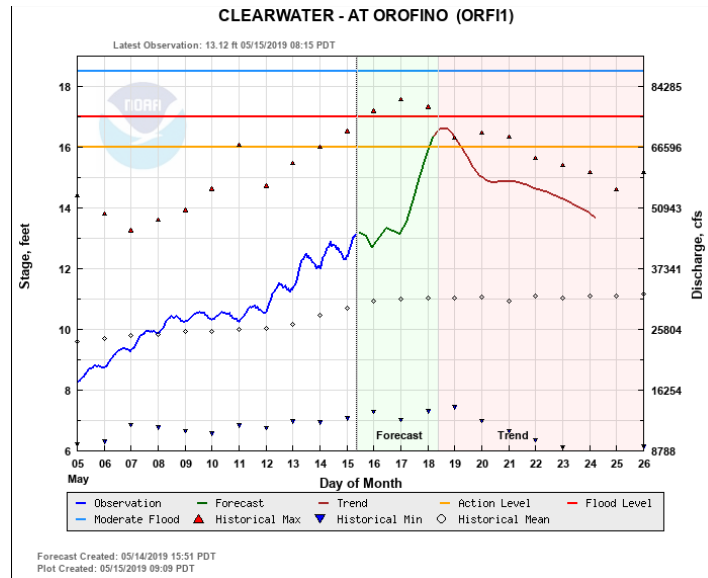
Steve Hall, Corps, reported on operations at Dworshak Dam. Midnight elevation was 1,578 ft, outflows are 2.9 kcfs, and tailrace TDG is 98%.

Dworshak is spilling. The forecast shows substantial water coming in, especially on Friday and Saturday. Some locations in the basin will receive 1-2” of precipitation. The NWRFC predicts this will put flows into Dworshak at 45 kcfs, reported Hall.



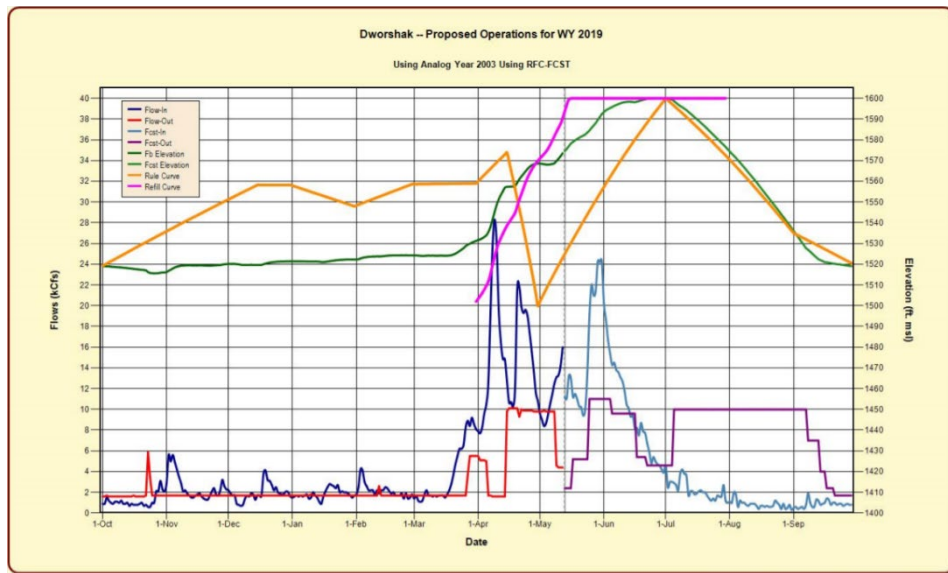
Historically, inflows have been this high or higher in 3 of the last 44 years (1979, 1997, and 2008). These years all had more snowpack than we currently have. However, flows have hit over 30 kcfs in 10 out of the 40 years. Flows such as this fill the reservoir quickly.

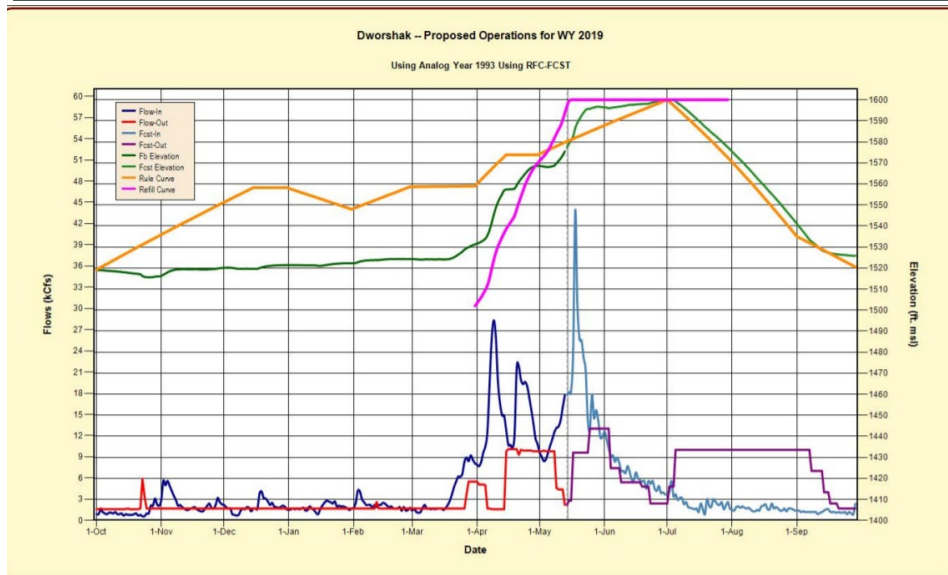
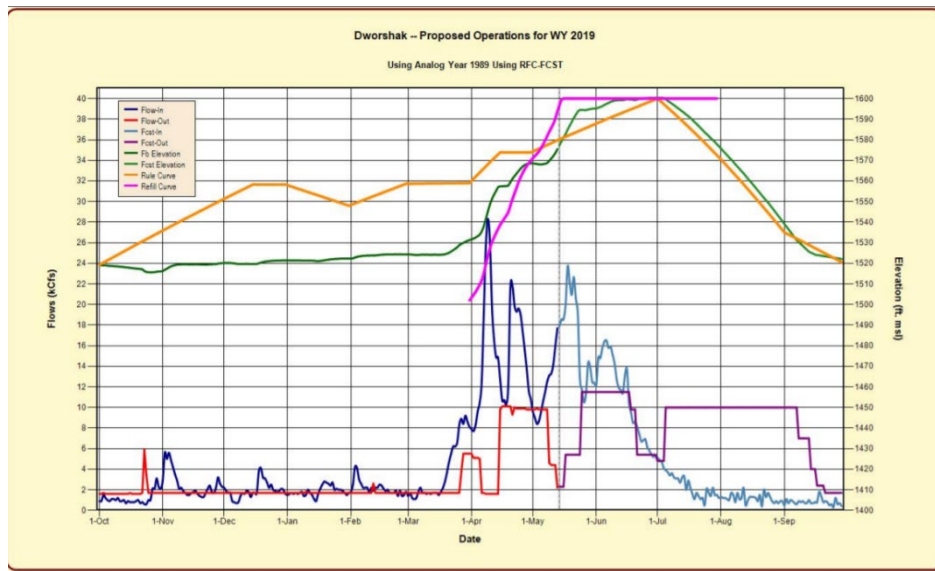
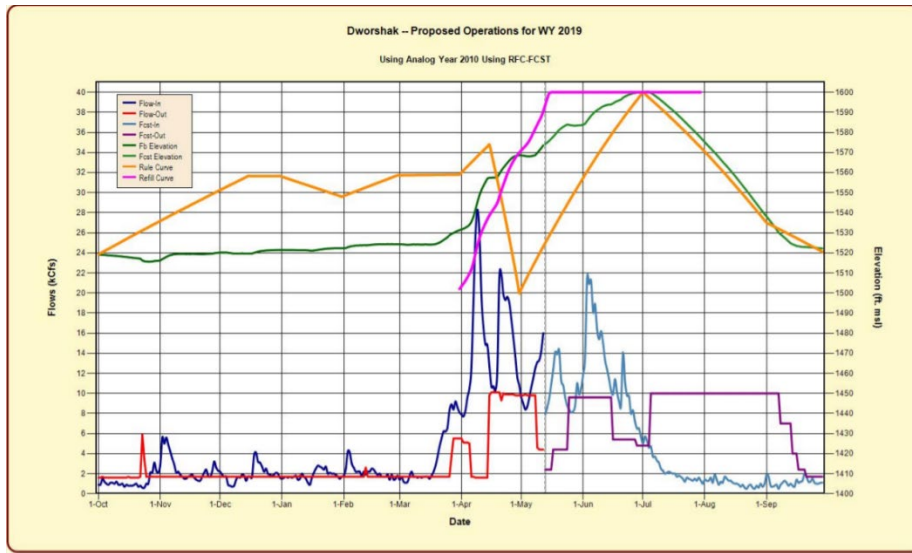
The forecast for the Clearwater River at Orofino shows flows increasing due to the storm. The peak, on May 18-19, is forecast to be above bank full but not at flood level.



The 10-day weather forecast shows above normal precipitation in the Clearwater Basin, with about 3 inches of precipitation over 3 days.

Hall showed a few operational scenarios that were created on Monday. The dip in the rule curve (yellow line) is an error.





If inflows are like those in the 1993 analog year shown in the last scenario (43,000 cfs), the project would have to spill significantly. Hall noted that there is some uncertainty about how much flow will enter the project as a result of the storm.

Since the storm seems to be focused on the Clearwater Basin, the Corps decided to start 700 cfs of spill last night at midnight. At this point, TDG in the tailrace is not exceeding 100%. They may increase spill slightly. If this is the case, Hall will report back with the information at TMT next week.

Hall noted that inflows of 40,000 cfs would result in a pool elevation just below full. As of this morning, the forebay elevation of 1,578 feet was 10 feet below the FRM limit based on the water control manual. The snow covered area according to National Operational Hydrologic Remote Sensing website is 40%. However, Hall said the website is notorious for being inaccurate in Clearwater Basin. Hall said based on the Snotel data, he thinks the snow line is probably 4,800 to 5,000 ft. He thinks there is no snow left at 4,500-4,600 ft.

As far as unit outages, Unit 2 is out and is scheduled to return on May 17 at 1700. The team thinks it will need the entire time for the outage. Once it is back in service, the powerhouse capacity will double. Unit 3 is out until the end of the day on May 24. The team also expects it will need the full allotted time for the outage to complete work. Neither unit is currently expected to return to service early based on the information Hall has. Scott Bettin, BPA, asked if testing ends early, is it possible to leave the unit running. Hall said he would ask the staff that question.

Jay Hesse, Nez Perce, commented that TDG can impact both the fish in Dworshak hatchery and downstream at the Big Canyon Creek hatchery as well as the fish in the river. His preference is that the Corps do everything they can to keep gas at or below 100% TDG to minimize stress on fish. He understands that it may not be possible but wanted to share his preference. He said the Nez Perce hatcheries will manage accordingly. Dworshak Hatchery will be receiving fish from Lyons Ferry next week due to water source issues and maintenance. Hesse said that the last few years have shown that the hatchery below Dworshak Dam is limited in its ability to reduce TDG and therefore the extra fish will be at risk if TDG levels increase above 100%. As an example, he said that if the river is at 105% TDG, the hatchery can reduce it down to about 102% TDG. One other example he gave was that they can decrease it from 110% to 103%. If possible, his preference would be to push some flow back to later in June.

Paul Wagner, NOAA, asked if the plan is to spill 4 kcfs beginning next week. Hall said the plan is to minimize gas as long as possible and spill 700 cfs through May 17 until Unit 2 is back and then double discharge. Right now discharge is about 2.9 kcfs. However, that depends on actual inflows. The project operates based on water on the ground and not the forecast as it can be inaccurate. Currently, the project is 10 feet below the FRM limit. As the forebay approaches full, the Corps will have to increase discharge.

Dave Swank, USFWS, asked if unit testing could be delayed if there was a delay in return to service. Hall replied that it is too late to change the testing and it will go on as planned.

4. Libby Sturgeon Pulse

4a. SOR FWS #1 – Jason Flory, USFWS

Jason Flory, USFWS, presented an SOR for this year's sturgeon pulse operation at Libby Dam. This year's SOR is similar to the SOR from last year that showed good results. The request is to repeat it this year but the agencies and tribe submitting the request were faced with a choice on how to run a similar operation with a lower water supply, using minimal volume. Flory reported that the May final forecast for April-August runoff in the Kootenai Basin is 4.9 MAF, which is within Tier 2 and sets the minimum sturgeon release volume at 0.8 MAF. They would like to use the same concept as last year and stretch the peak and pulse as long as possible. Thus, they are requesting 20 kcfs out of Libby. The SOR is available on the TMT website. The operation would include:

- One period of ramp-up/pre-peak/ascending limb flows, one period of peak flow (limited to 20,000 cfs), and one period of ramp-down/post-peak/receding limb flows.
- Selective withdrawal gates would be installed at Libby Dam prior to and during the augmentation operations, with the objective of passing the warmest water available in the forebay.
- Release of the warmest water possible from Libby Dam, in combination with lower volume of release, will allow the Kootenai River temperature to increase to appropriate spawning temperatures at Bonners Ferry (8-10°C) during the receding limb of the hydrograph.
- A minimum recommended release volume of 0.80 MAF (Tier 2).

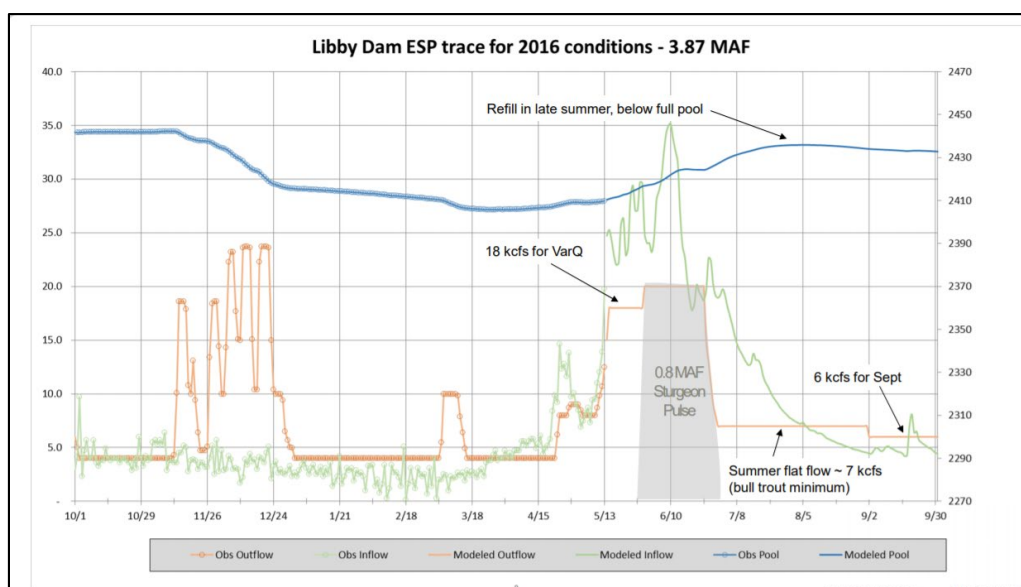
Erick Van Dyke, OR, asked how long a 20,000 cfs operation would last. Flory said based on this year's water supply, it would be a very short peak and then be over.

4b. Libby Operations – Logan Osgood-Zimmerman, Corps NWS

Logan Osgood-Zimmerman, Corps NWS, reported on Libby Dam operations to implement the sturgeon pulse, saying that the water supply forecast of 4.9 MAF is just above the cutoff for a sturgeon pulse and sets the sturgeon volume at 0.8 MAF and the bull trout minimum flows after the Sturgeon Pulse through August 31 at 7 kcfs. Current VarQ flow is 18,000 cfs.

Based on the May final forecast for April-August runoff at The Dalles of 82.4 MAF (94% of normal), the Libby target draft is 10 feet from full (2,449 feet) by end of September, but will likely not reach full or even the target draft elevation.

Low elevation snow is gone as is most mid-level elevation snow. Osgood-Zimmerman presented a figure of Libby operations (below) and said that the end of May is probably when the projects will see a higher inflow peak. The majority of the volume should come in June, she said. Libby has been on minimums all winter and inflows have been and will remain below average. The July peak is estimated at 2,436 ft. It looks like it will be a low refill year with a stable pool. The Corps will likely be on minimums after the sturgeon pulse. There is no SOR from the Kootenai for minimum flows in September this year.



Russ Kiefer, ID, asked the purpose of the VarQ flows. Osgood-Zimmerman said they are FRM and BiOp operations. Some of the reason they are so high is to provide water to the lower Columbia River. Part of the idea of VarQ is not to draft the reservoir as much in dry years (i.e., different FRM requirements requiring less draft), allowing higher releases in the spring during dry years.

TMT members were polled on the SOR. The results are as follows:

Army Corps of Engineers	Support
Bonneville Power Administration	Support
Bureau of Reclamation	Support
NOAA Fisheries	Support
US Fish & Wildlife Service	Support
Washington	Support
Oregon	Support
Idaho	Support

Montana	NOT PRESENT *Doug Will follow-up
Nez Perce Tribe	Support
Umatilla Tribe/CRITFC	NOT PRESENT
Colville Tribe	Support
Warm Springs Tribe	NOT PRESENT
Kootenai Tribe	NOT PRESENT
Spokane Tribe	NOT PRESENT

Doug will circle back with Montana since they are an important voice in this conversation. The Corps will implement the SOR barring any objections from Montana.

5. FOP Spring Spill

5a. Spill & TDG – Dan Turner, Corps

Dan Turner, Corps, reported on spring spill. The Corps is implementing the flex spill agreement by maximizing spill but not exceeding 120% TDG. There was a small bump yesterday at Lower Monumental to 121% TDG. In response, the Corps made a spill cap decrease. He said it is typical to see an increase or decrease of 1% as there is some natural variability.

On the lower Columbia River, as coordinated with TMT last Friday, the Corps is operating The Dalles and John Day in tandem in order to maintain at least 40% spill at The Dalles. Right now the Corps is operating to meet three goals. When all three goals cannot be met, the first two goals will be prioritized:

1. 120% TDG in The Dalles tailwater;
2. Spill cap of at least 40% at The Dalles;
3. 120% TDG in the John Day tailwater.

The operation is working as intended. Temperatures decreased, wind increased and environmental factors changed so both John Day and The Dalles are at 119% TDG. Now, the Corps has increased the John Day spill cap to try to meet all three goals. It looks like this will get both projects to 120% TDG. Turner said it is likely spill will become involuntary due to higher inflows forecasted starting on Friday, May 17.

5b. Flex Spill Implementation – Tony Norris, BPA

Tony Norris, BPA, reported on flex hours. BPA is flexing at all projects except The Dalles since the spill cap is the same as the performance standard.

6. Operations Update

6a. Reservoirs – Eric Rothwell, Reclamation, and Lisa Wright, Corps

Hungry Horse – Elevation 3,536 ft; outflows 5.5 kcfs.

Grand Coulee – Elevation 1,273 ft; passing inflow at 130 kcfs.

Libby – Elevation 2,411.6 ft; yesterday average inflows were 31.4 kcfs and outflows were 17.1 kcfs.

Albeni Falls – Elevation 2,057.4 ft; yesterday average inflows were 57.6 kcfs and outflows were 49.3 kcfs.

Dworshak Dam – Elevation 1,577.4 ft; yesterday average inflows were 18.2 kcfs and outflows were 2.2 kcfs.

Lower Granite – Yesterday average outflows were 126.8 kcfs.

McNary Dam – Yesterday average outflows were 294.5 kcfs.

Bonneville – Yesterday average outflows were 308 kcfs.

6b. Water Quality

Nothing further to report.

6c. Fish – Paul Wagner, NOAA

Adults: Passage is picking up but running well below average. At Bonneville, the total number of spring Chinook adult returns so far this season is 39,861, which is only 35% of the 10-year average. Jack Chinook are at 2,753, 22% of average, but it is still early in the season. Steelhead returns are 1,934.

At Lower Granite, spring Chinook returns are 1,219, well below the 10-year average.

Juveniles: The Salmon River trap was taken out for the season due to high flows and likely won't be reinstalled. Fish are continuing to pass at all projects. Yesterday, Bonneville had a yearling Chinook index of 70,000, showing that the run is active and strong.

Subyearling Chinook have been released in the Snake River from various hatcheries. Spring Creek hatchery releases resulted in strong numbers at Bonneville.

For steelhead, numbers are less but many have passed already. All the projects are showing good passage. Looking at DART, steelhead passage is strong at all projects and consistent with the timing and magnitude of the 10-year average.

Sockeye are starting to show at Lower Granite and downstream projects.

Lamprey counts were over 90,000 in April, which is the highest seen in the last 10 years, three times what has historically been seen in April.

Russ Kiefer, ID, reported that the water chemistry issue at the Springfield Hatchery seems to be resolved. Sockeye smolts should be in good condition and survive well this year. Scott Bettin, BPA, asked if releases are complete for the season. Kiefer said he would report back offline but thinks they are over.

6d. Power - Tony Norris, BPA

Wind has been high and there has been considerable wind generation.

7. Next TMT: conference call on May 22 at 9am.

Today's Attendees:

Agency	TMT Representative
Army Corps of Engineers	Doug Baus (Chair), Julie Ammann, Lisa Wright
Bonneville Power Administration	Tony Norris, Scott Bettin
Bureau of Reclamation	Eric Rothwell
NOAA Fisheries	Paul Wagner, Claire McGrath
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Russ Kiefer
Montana	N/A
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	N/A
Colville Tribe	N/A
Warm Springs Tribe	N/A
Kootenai Tribe	N/A
Spokane Tribe	N/A

Other Attendees (non-TMT members):

Army Corps of Engineers – Dan Turner, Steve Hall, Aaron Marshall, Catherine Dudgeon, Heather Baxter, Erin Kovalchuk

DS Consulting – Emily Stranz (Facilitator), Colby Mills

FLUX Resources – Melissa Haskin (Note taker)

USFWS – Jason Flory

Oregon DEQ – Paula Calvert

NPCC – Lynn Palensky

Clearing Up – K.C. Mehaffey

Columbia Basin Bulletin – Mike O’Bryant