COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
February 22, 2018
Facilitator's Summary
Facilitator & Notes: Emily Stranz; Support: Donna Silverberg, 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.nwd-wc.usace.army.mil/tmt/agendas/2017/

Dworshak Operations
Steve Hall, Corps, reported on current and proposed operations at Dworshak. Current elevation is 1,522.7ft, with 4kcfs inflow and 20 kcfs outflow. TDG levels in river are around 122% and between 104.5-105% in the hatchery. A recent temperature decrease in the basin helped to lower TDG in the hatchery. Steve noted that the 10-day NW RFC forecast is calling for colder and wetter weather; the 30-day forecast is calling for higher than average temperatures and lower than average precipitation; and the 90-day forecast is calling for below average temperatures and above average precipitation.

Per the TMT's request at the 2/21 meeting, Steve provided a modelled scenario, which can be accessed on the TMT website. The scenario considers dropping discharge to 18kcfs through 3/10 and then dropping further down to 16kcfs until 4/10, followed by an increase to 20kcfs on 4/10 in order to meet the 4/15 flood control elevation target, which is still expected to be 1,445ft. The 20kcfs discharge would need to be held until the project intercepts the flood control curve, which may or may not be on 4/15. Steve noted that at this point, the project does have the flexibility to drop down to 18kcfs, however, if inflows increase dramatically, they will need to move a significant amount of water in a short amount of time.

Per the TMT's request at the 2/21 meeting, Dave Swank, USFWS, and Jay Hesse, Nez Perce, provided information on fish health and hatchery operations. Dave noted that fish health sampling was conducted earlier in the day and showed:

- Spring Chinook (from the B bank) are in water with 101-101.5% TDG. They have low levels of gas bubbles in their gills and lateral lines and are still feeding well. 9 of the 10 sampled had full stomachs. However, 2 of the 10 sampled had rank 2 bubbles in their lateral lines, which is concerning.
- Steelhead (from system 3) are in water with 104.5% TDG. They found rank 1 gas bubbles in their gills and lateral lines; and 2 fish had bubbles in their caudal fins. This is also of concern to the hatchery. One fish had cataracts; however, the cause of the cataracts is unknown and may not be related to TDG, as fish in the river water (with higher TDG) showed less cataracts than others sampled who were on a mix of river and upstream reservoir water.

Jay reported on in-river temperature units and expected hatching times. He noted that the fall Chinook in the Lower Clearwater are at the same point as the fish were last year and are expected to emerge towards the end of March. Fall Chinook in the North Fork of the Clearwater are 2 days behind those fish and some may already be emerging. He also shared that the hatchery is in the process of planning for early release of fish; however, coordination will take a couple of weeks.

Due to the decrease in TDG in the hatcheries and the fact that fish are still feeding well, it was suggested that the Corps continue to discharge 20kfcs through the end of February and revisit the operation at the 2/28 TMT meeting. All TMT members present (BPA, Corps, ID, OR, Nez Perce, NMFS, Umatilla, USFWS, and Warm Springs) were comfortable with this operation.

→ **Action:** The Corps will hold 20kcfs discharge at Dworshak Dam through 2/28, at which point the TMT will reconvene to discuss recommended operations moving forward.

→ **Action:** The TMT will revisit DWR operations at the February 28th TMT meeting; Steve will provide additional modelling to inform the conversation (holding 20kcfs for 1st week of March, and dropping to 16kcfs in March and holding into April). Steve will do his best to get the model runs to FPAC for their meeting on 2/26 at 1:00pm.

The next TMT meeting will be a conference call on Wednesday, February 28, at 9:00am.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

February 22, 2018
Minutes: Pat Vivian

1. Introduction

Representatives of the COE, NOAA, BPA, Nez Perce Tribe, USFWS, Washington, CRITFC/Umatilla Tribe, Idaho, Oregon, Warm Springs Tribe and others participated in today's TMT call chaired by Doug Baus, COE, and facilitated by Emily Stranz, DS Consulting.

2. Dworshak Operations

Today's TMT call was planned to follow up on several action items raised during a call yesterday, February 21, and provide additional information in light of TDG levels over 106% saturation in the federal and tribal hatcheries below Dworshak Dam. High inflow predictions and an imminent need to release significant volume for flood control prompted an extra check-in on Dworshak operations. Steve Hall, COE Walla Walla, reported.

2d. Hourly Data. Current reservoir elevation is 1522.7 ft, with inflows still at 4 kcfs and discharges of 20 kcfs.

2e. Total Dissolved Gas Report for Dworshak. Levels in the river are still around 122% saturation. Temperatures in the area have risen as a result of recent storm activity.

2f. Dworshak National Fish Hatchery Collection Channel (DHCI) Total Dissolved Gas. Since February 17, Dworshak has been releasing 20 kcfs. During a period of extreme cold on February 20-21, TDG levels in the Dworshak National Fish Hatchery rose from 105% to over 106% saturation, the level at which fish begin to suffer adverse effects. Yesterday afternoon TDG levels declined to 104.5-105% when temperatures moderated a bit. The change illustrates the effects of low temperatures and icing on TDG in the hatchery.

2a. Snow Analysis. The forecast hasn't changed since yesterday's conversation.

2c. Operations. The COE presented modeling to show what would happen if Dworshak releases drop to 18 kcfs starting tomorrow night, February 23, through March 10, then drop to 16 kcfs through April 7-10. This would mean returning to 20 kcfs in April to meet the April 15 flood control elevation. Another issue is when the hydrograph intercepts the flood control refill curve

(FCRC). The flood control elevation must be maintained until the FCRC is intercepted.

Hall pointed out that 2011, the analog year used for modeling, had a high spike of inflows in early April. This year, it is unknown when that spike might occur – it could be March or April. The 10 day forecast shows 4 kcfs inflows continuing, with colder and wetter conditions than normal. This contradicts the long term forecast of warmer and drier conditions than normal.

If inflows increase, it could be necessary to release more water. All indications are that the reservoir will need to draft to 1445 ft by mid-April, which means releasing a lot of water, especially if inflows are heavy like they were in 2011.

Paul Wagner, NOAA, asked how the 90 day forecast of below average temperatures and above average precipitation plays into the overall picture for Dworshak. By contrast, the 30 day forecast shows above average temperatures and below average precipitation, Hall replied. It's difficult to know which forecast to believe.

Erick Van Dyke, Oregon, asked whether the reduction to 16 kcfs releases as modeled will necessitate a spike to 20 kcfs releases beginning in April. That all depends on weather, Hall replied, especially if there's a jet stream directly off the Pacific Ocean. A reduction in outflows would be most likely to occur within days of a drop in inflows.

Jay Hesse, Nez Perce Tribe, asked about trading the bump up to 20 kcfs leading to the April 15 flood control elevation in the model for a dip in releases at the end of April. Is that an option TMT could discuss if the situation arises? Yes, Hall replied, but we don't know when the reservoir will intercept the refill curve and whether the dip would materialize as modeled. Typically, there's a sharp drop in releases when the reservoir intercepts the refill curve. Not increasing releases for 5-8 days after that would probably require a deviation request. Hesse said his preference is to not reduce discharges by 2 kcfs now, Hall agreed.

Dave Swank, USFWS, reported on fish condition at Dworshak National Fish Hatchery. Spring Chinook were taken from the B bank, where they've been getting the partial benefit of a low head oxygenation system. Total dissolved gas levels in B bank have been 101-101.5% saturation. Fish are experiencing fairly low levels of gas bubbles in the gills and lateral lines, similar to what happened last spring. The good news is that the fish are feeding well. Hesse noted that 2 fish of 10 sampled had rank 2 bubbles in the lateral lines, which is concerning.

Steelhead from system 3 in Burrows Pond are getting water from the river that goes through the degassing system, producing a high TDG level of 104.5% this morning, Swank said. The best news is that all fish had normal food levels in their stomachs. Surveyors observed rank 1 bubbles in the gills and lateral lines, although one fish had rank 2 bubbles in the caudal fin, which is concerning, but not surprising. There were no bubbles in the fins or eyes. A sample of 100 fish from 3 different ponds found that in system 1, about 9% of the fish had cataracts, while in ponds 2 and 3, which receive water directly from the river, about 1-2% of the fish had cataracts. This implies that cataracts might not be caused by high TDG levels; USFWS is still investigating. Overall, despite some GBT symptoms, the fish are doing reasonably well.

An initial analysis of temperature unit accumulation and emergence timing for in-river fall chinook suggests that the majority of those fish will emerge in late March, Hesse said. Temperature unit accumulation is accelerated in the North Fork Clearwater, so those fish might have already emerged from the gravel.

In terms of conditions for an emergency release, given the inflow forecast and lack of opportunities to reduce TDG levels in the river, hatchery staff are planning ahead, such as booking a truck to transport fish which takes 2 weeks. Fish food is being ordered in smaller quantities because hatchery staff don't know how long fish will be on station. As for warming the degassers, efforts are being made to include that cost in the FY18 budget.

At this point, discussion turned to the Dworshak operation going forward. TMT had basically two options to consider: (1) As depicted in the graphic, drop outflows to 18 kcfs tomorrow night through March 10, depending on inflows; or (2) Hold 20 kcfs releases through the end of February and hopefully drop to 16 kcfs after that. The official water supply forecast should be available by March 2 and no later than March 5.

Swank said his main concern is that TDG levels in the collection channel be kept at 105% or lower, the level hatchery staff have identified as triggering adverse impacts. Now that's the case, **USFWS** would be willing to continue 20 kcfs releases from Dworshak until the next TMT call on February 28. The **Nez Perce** were also willing to continue 20 kcfs releases until TMT meets again, then hopefully releases would drop to 18 kcfs and 16 kcfs. **Oregon** supported the Nez Perce-proposed operation to hold 20 kcfs releases.

Likewise, the **COE**, **Idaho, NOAA, USFWS, BPA,** and the **Warm Springs Tribe** all supported 20 kcfs releases from Dworshak through the end of February. **CRITFC/Umatilla Tribe** supported 20 kcfs releases unless fish condition deteriorates, at which point the tribe would request that Dworshak discharges be reduced.

With TMT consensus on holding 20 kcfs through the end of February, the focus turned to what might happen after that. Hall will update the model and present it at the next TMT meeting. USFWS will confer with hatchery staff and give TMT an updated report on fish condition. There will not be a water supply forecast other than the RFC's daily forecast, but the COE will provide updated weather scenarios.

The COE will present several scenarios for ramping down Dworshak outflows from 20 kcfs in March. Lorz suggested the model depict 20 kcfs for the first week of March and 18 or 16 kcfs thereafter. Hesse suggested modeling the effects of releasing 20 kcfs for the first week of March, then dropping releases to 16 kcfs through April 15.

3. Next TMT Meeting

TMT will meet next in person on February 28 to revisit Dworshak operations.

Name	***Affiliation***
Paul Wagner	NOAA
Scott Bettin	BPA
Doug Baus	COE
Mike O'Bryant	CBB
Jay Hesse	Nez Perce
Charles Morrill	Washington
Tom Lorz	CRITFC/Umatilla
Russ Kiefer	Idaho
Alfredo Rodriguez	COE Walla Walla
Steve Hall	COE Walla Walla
Erick Van Dyke	Oregon
Ann Setter	COE
Eric Chow	COE
Donna Silverberg	DS Consulting
Jen Graham	Warm Springs
Dave Swank	USFWS