**COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM**
February 7, 2018
DRAFT Facilitator's Summary
Facilitator & Notes: Emily Stranz, 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/*

**Official Water Supply Forecasts**
Peter Cooper, BOR, reported on the official February water supply forecast volumes for Hungry Horse (using the 5-day QPF):

- May-September: 2,062kaf (122% of normal)
- February- July: 2,474kaf (122% of normal)

Additionally, Peter shared that the end of February elevation target is 3529.5 ft, which will require an increase in outflows. BOR plans to increase to 7kcfs out on 2/8 and may need to spill to meet the target. Peter also noted that although not yet official, it is looking like the end of April flood control elevation at Grand Coulee will be below 1,255ft which would trigger drumgate maintenance at Grand Coulee this year.

Doug Baus, Corps, reported on the official February water supply forecast volumes for Corps projects (using the 5-day QPF):

- The Dalles April-August: 95maf (108% of average)
- Lower Granite April-July: 21maf (106% ofaverage)
- Libby April-August: 6,765kaf (115% of average)
- Dworshak April-July: 2,849kaf (117% of average)
- Grand Coulee April-August: 65maf (114% of average)
- Albeni Falls April-August: 16maf (129% of average)

Doug directed the group to the monthly precipitation and temperature tables for the Snake River and Columbia River basins. Precipitation for January was below normal in the Snake River, Upper Columbia below Arrow Dam, and in the mainstem above The Dalles Dam. Precipitation was above normal in the Upper Columbia in the Kootenai Basin. Regarding temperatures, the Snake, Upper and mainstem Columbia River all experienced January temperatures that were above average, with deviations ranging from 3.8 to 6.6 degrees F above normal.

**Dworshak Operations**
Steve Hall, Corps, reported on Dworshak operations and conditions. The current forebay elevation is 1,539.3 feet and is rising. The increased elevation is the result of a recent storm which brought 6-hour average inflows up to 35kcfs. Inflows are declining now and are around 20kcfs; outflows are currently 6kcfs. TDG in river downstream of Dworshak is 115% and between 101.5-102% in the hatchery.

RFC inflow forecasts predict a decrease in flows this week, followed by a slight bump over the weekend and overall decrease in the next 10 days. Typically, inflows for this time of year are around 5kcfs. Ambient temperatures in the region are expected to be normal or neutral for the next 8-10 days; precipitation is expected to be below average for the next 30 days, however, above average over the next 90 days.

Steve shared that Unit 2 is expected to return to service from annual maintenance by the end of the day today (2/7) at which point it will be turned on to help move more water out, increasing outflows to around

12.5kcfs. After talking with some Salmon Managers, Steve noted that it was preferable to have higher TDG levels now than later on. It is expected that the increase in outflows will increase TDG in river to around 116-117% and to around 102% in the hatchery. Steve noted that the addition of a turbine will help keep in river TDG down and that the hatchery degassers are more efficient at removing gas with higher levels of gas.

Jay Hesse, Nez Perce explained that there are degassers in some of the Chinook units, however, the Coho and steelhead units do not have degassers and are thus exposed the full 102%. Additionally, he noted that the steelhead in the hatchery now are the same fish that were exposed to sustained and elevated TDG levels last year. These fish appear to be on track as far as their size and eating behaviors are concerned, and the hatchery staff will implement monthly gas bubble trauma (GBT) monitoring and more frequent behavior monitoring. Jay will report findings to TMT regularly.

The Corps clarified that based on modelling, increasing outflows to 12.5kcfs is not sufficient to meet the end of February flood control elevation target, instead they would come in high. This operation would however, allow them to meet the end of March and April 15th targets. The Corps will have to seek an internal deviation to deviate from the end of February flood control elevation. Additionally, they agreed to provide the TMT with an "early bird" forecast in time for the 2/14 TMT meeting.

- **ACTION: Once Unit 2 is returned to service, the Corps will increase outflows to 12.5kcfs at Dworshak and hold there until mid-April (or a revised operation is coordinated).**
- **ACTION: The Corps will provide a mid-February "early bird" forecast to inform TMT's conversations on 2/14.**

**The next TMT meeting will be a conference call on February 14th at 9:00.**

**Columbia River Regional Forum**
**TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES**

**February 7, 2018**
Minutes: Pat Vivian

## *1. Introduction*

Representatives from the Nez Perce Tribe, BPA, BOR, USFWS, NOAA, COE, Washington, Yakama and Warm Springs Tribes, Idaho, Oregon and others participated in today's TMT conference call chaired by Doug Baus, COE, and facilitated by Emily Stranz, DS Consulting.

## *2. Official Water Supply Forecast*

**2a. Forecasts.** Peter Cooper, BOR, and Doug Baus, COE, presented the official February water supply forecasts for individual basins:

- Hungry Horse (May-September) – 2062 kaf, 122% of average
  February-July – 2474 kaf, 122% of average
- The Dalles (April-August) – 95 maf, 108% of average
- Lower Granite (April-July) – 21 maf, 106% of average
- Libby (April-August) – 6765 kaf, 115% of average
- Dworshak (April-July) – 2849 kaf, 117% of average
- Grand Coulee (April-August) – 65 maf, 114% of average
- Albeni Falls (April-August) – 16 maf, 129% of average

The Hungry Horse official forecast indicates the reservoir will be at elevation 3529.5 ft by the end of February, down from its current level of 3537.1 ft, Cooper reported. Discharges are 5900 cfs at maximum generation using both units available. Tomorrow discharges will be increased to 7 kcfs to meet flood control requirements, which should keep TDG levels below 110%. The Grand Coulee official forecast indicates the reservoir elevation will dip below 1255 ft this year. That means the BOR will do drum gate maintenance this summer.

**2b. NWRFC Precipitation and Temperature Summaries.** Weather throughout the basin in January was much warmer than normal, Baus reported. Precipitation on the Snake River above Ice Harbor Dam was 85% of normal. Precipitation in the upper Columbia basin is currently 114% of normal on the Kootenai River and 92% of normal in the Columbia basin above Arrow Dam. In January, the Snake River basin above Ice Harbor was generally around 6 degrees F warmer than normal, and Upper Columbia temperatures were 5 to 6.6 degrees F warmer than normal. In the mid-Columbia, temperatures were 3.8 to 4.8 degrees F above normal; the same was true on the mainstem Columbia.

Jay Hesse, Nez Perce Tribe, asked why precipitation on the Snake River above Ice Harbor was below normal in all recent months, yet the water supply forecast above Lower Granite is more than 106% of normal. The precipitation values shown in the table linked to

today's agenda are basin wide, but the water supply forecast is based on snow accumulation, which is a different thing, Steve Hall, COE, replied. Precipitation levels across the Snake can be lower than normal at the same time high elevation snowpack is above normal. Generally speaking, the upper Snake River above American Falls tends to have above normal elevation snowpack, as does the Clearwater basin, while snowpack at lower elevations is below normal contributing little to runoff volume. Furthermore, precipitation values include valley floors and other areas that generally don't have snowpack.

**2c. NWRFC Current Snow Condition.** Current snow conditions indicate that water supplies in the Cascades in Oregon are below normal. This is also the case in southern Idaho and eastern Oregon, but the northern Cascades and Rockies have above average snow accumulation. The strong snow water equivalents (SWEs) on the northern side and eastern edge of the Columbia basin are due to a storm originating in British Columbia.

***3. Dworshak Operations***

**3a. Hourly Data.** A few days ago, a storm over the north fork Clearwater caused Dworshak inflows to peak at about 35 kcfs and drop to the present level of 20 kcfs, Hall reported. Reservoir elevation is 1539.3 ft and continuing to rise.

**3b. Total Dissolved Gas Report for Dworshak.** Dam releases are limited to 6 kcfs because unit 2 is out of service for annual maintenance. This operation is producing TDG levels of 115% downstream of Dworshak Dam. The unit is expected to return to service today, and once it's back online, discharges should double.

**3c. DWR National Fish Hatchery Collection Channel Total Dissolved Gas.** Total dissolved gas levels in the hatchery peaked at 102% saturation and have been hovering around 101.5-102% recently.

**3d. NWRFC Dworshak Dam Inflow Forecast.** The River Forecast Center is predicting inflows will continue to decline from 20 kcfs, with a slight bump over this coming weekend and reduction for the rest of the 10 day forecast period. Normally, inflows in February average 5 kcfs, so current inflows are considerably above normal.

**3e. DWR Operations Scenario.** This graphic linked to today's agenda was generated based on STP inflow projections from yesterday through the end of March and the first half of April, using 1983 as a surrogate year. It shows inflows rising to 35 kcfs then dropping, which is why the COE intends to double discharges once unit 2 goes back into service. After conferring with the Salmon Managers, the COE proposed that Dworshak discharges increase to 12.5 kcfs now, when high TDG levels are less damaging to the river environment.

Current DWR outflows are 6 kcfs. Modeling indicates increasing project outflows to 12.5 kcfs on February 7, will meet the March 31 and April 15 flood risk management (FRM) elevations but could be 4 feet above (1520.5 feet) the February 28 elevation of 1516.5 feet.

The modeling indicates there's a need to move water now, Hall said. Julie Ammann, COE, added that a deviation request, an internal COE process, would be required if it looks like Dworshak won't meet its end of February flood risk management target of 1516.5 ft.

There are several reasons a deviation request might be needed, Hall said: (1) The RFC's water supply forecast is 2.6 maf of runoff as opposed to the COE forecast of 2.85 maf, a disparity of about 250 kaf which is significant. (2) The recent storm event decreased SWEs at elevations below 5,000 ft while adding to SWEs above 5,000 ft. A significant portion of low elevation snow melted off during this event, but colder weather is forecasted and snowpack could be replenished in February. The COE intends to fly into the north fork Clearwater and verify SNOTEL site readings as soon as weather conditions allow.

Paul Wagner asked about the TDG effects of increasing DWR discharges to 12.5 kcfs. Last year, TDG levels of 120% in the river produced 105% saturation in hatchery raceways, Hall recalled. Discharges of 12.5 kcfs would probably produce TDG levels of 116-117% in the river, with a corresponding increase in hatchery levels of approximately 102% saturation because the degassers work more efficiently as TDG levels rise.

Charles Morrill, Washington, asked whether cooler temperatures are forecasted over the next 10 days. Yes, Hall said, but the Climate Prediction Center's 8-14 day forecast shows neutral conditions and the possibility of slightly warmer temperatures and drier conditions. The 30 day forecast is still showing cooler temperatures and equal chances of above or below average precipitation. The three month forecast shows below normal temperatures and above normal precipitation.

Jay Hesse, Nez Perce Tribe, requested a mid-month check-in given the uncertainties in February runoff forecasting. He reminded everyone that the Dworshak hatchery has taken additional gas management actions in some chinook rearing units to reduce their exposure to TDG. But coho and steelhead – the same fish that were exposed to elevated TDG levels last summer – will experience saturation levels of 102%. The hatchery plans to initiate GBT monitoring, maintain monthly sampling, monitor fish behavior, and do additional testing if abnormal conditions develop. The fish are within their expected size range and have no observed excessive mortality.

Hall said the COE will provide TMT members a mid month forecast although it won't be official.

***4. Next TMT Meetings***

With interest in a mid-month early bird forecast for Dworshak inflows, the COE will run a forecast the morning of February 14 so TMT can discuss it in a 9 am conference call. TMT will meet in person on February 21.

| ***Name*** | ***Affiliation*** |
|---|---|
| Jay Hesse | Nez Perce |
| Scott Bettin | BPA |
| Peter Cooper | BOR |

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|---|---|
| Dave Swank | USFWS |
| Paul Wagner | NOAA |
| Doug Baus | COE |
| Julie Ammann | COE |
| Lisa Wright | COE |
| Steve Hall | COE Walla Walla |
| Wayne Jousma | COE Walla Walla |
| Alfredo Rodriguez | COE Walla Walla |
| Dave Benner | FPC |
| Michael Bryant | CBB |
| Michelle Yuen | COE |
| Charles Morrill | Washington |
| Tom Iverson | Yakama |
| Jen Graham | Warm Springs |
| Dan Turner | COE |
| Jay Pence | Chelan PUD |
| Russ Kiefer | Idaho |
| Erick Van Dyke | Oregon |