

## **COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM**

March 15, 2017

Facilitator's Summary

Facilitator: Emily Stranz; Notes: Charles Wiggins, 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/>*

### Meeting Summaries & Minutes

Members approved TMT meeting minutes and summaries for February 15, 22, and March 1 and 3, pending some changes to the February 15<sup>th</sup> minutes. The March 8 and 13 minutes and summaries will be posted and approved at the next April 5 meeting.

### Dworshak Operations

Steve Hall, Corps, provided an update on Dworshak operations. Currently the reservoir elevation is 1507.4 ft. and filling. Outflow is 22.5 kcfs, with 5 kcfs through the powerhouse and the balance through the RO gates. Inflow is 19 kcfs, and has been rising rapidly. On March 14<sup>th</sup>, the 6-hour inflow was 14kcfs, end of day was 21.4kcfs, the morning of the 15<sup>th</sup> was 26.5kcfs, and at 0700 on the 15<sup>th</sup> was 32.2 kcfs. The NWRFC forecast calls for peak inflow on March 16 at 70 kcfs, though the Corps is anticipating closer to 45 kcfs. The 10-day forecast is for substantial precipitation for 4 days, then backing off for 2 days, then wet again. Snow density, measured in real time, is 33% at Cool Creek and 45% at Shanghai with a little decline in SWE.

In river TDG levels have been between 124.9 and 126 percent, varying largely because of fluctuations in barometric pressure. Water temperature changes and a rapid change in gauge depth also contributed. In answer to a question, Julie Ammann, Corps, will report back to the next TMT on what TDG levels would be expected if all turbines were available and running at capacity of 10 kcfs. Erick Van Dyke, OR, asked about the variables for TDG percentages, noting that it should incorporate barometric pressure. Margaret Filardo, FPC, noted that TDG calculations are a direct calculation of TDG/barometric pressure, and measures super saturation relative to solubility in the water column.

Yesterday's early bird water supply forecast (calculated assuming current conditions and no further precipitation until the end of March) suggests an April water supply of 2.965 maf. Extrapolating current weather conditions from the end of February suggests a 3.57 maf. Another run that the Corps conducted using a different forecast method suggest 3.2 maf if assuming no additional precipitation, or 4 maf if extrapolating from the end of February. Variability factors include the chance of significant snowmelt, especially at lower elevations; basin temperature; and additional precipitation. The NWRFC downgraded its prediction to 2.64 maf for the 10 day forecast and 2.58 maf for the 0 day forecast.

Julie Ammann explained current system operations. She noted that the Corps has declared a system-wide flood emergency due to the flood stage forecast at Vancouver. This requires that the Corps call on the Districts to help manage flows in the upper basin to alleviate flows in the lower basin. The Corps has therefore asked the Walla Walla District to hold outflow at Dworshak at 22.5 kcfs for 3-4 days, depending on real-time conditions. These operations may cause the end-of-month reservoir elevation to be higher than the flood control target; the Corps will do what they can to not exceed 25 kcfs (channel capacity below the dam). It was noted that project regulating

outlets could release up to 45 kcfs, if needed, to protect the structure from overtopping (not the current situation), and there may be some flexibility to go higher as flows in the mainstem decrease. Releases of this magnitude (45 kcfs) would impact people and fish downstream and are not currently planned. Julie noted that the situation is dynamic and the Corps will track and respond to any changes as necessary. Additionally, the Corps may also be using Dworshak Dam for local flood control based on the forecasted increase in stage at the Orofino, and Spalding gages.

→ ACTION: The Corps will manage DWR based on local and system flood control needs. At this point in time, they expect to hold 22.5kcfs outflow until Saturday, potentially longer. Operations are subject to changed based on real-time conditions and FRM needs.

Jay Hesse, Nez Perce, noted concern that a reaction operation to the current operation may cause more harm to fish if it required increasing outflows to 25 kcfs.

#### Dworshak National Fish Hatchery Operations

Steve Rogers, DWR Hatchery, reported on fish health. They are currently starting to smolt, however, are not up to size for release. From a sample of 10 fish in the raceway, 9 had bubbles in the gills, 6 in the midline, and 1 in the caudal fin. Of 10 steelhead sampled, 4 had bubbles in the gills and 2 in the dorsal and caudal fins. In summary, gas problems are increasing in the number of fish, the location, and the level of bubbles.

The hatcheries are considering releasing as early as next week. BPA and the Corps suggested that it would be easier to drop down to 8kcfs this week, when they know that they have to hold back for local flood control. Hatchery managers did not think that they would be able to release this week, however, agreed to coordinate internally and reconvene with TMT on Friday at 1:30.

→ ACTION: Hatchery manager will discuss release timing options and come to TMT on Friday, March 17<sup>th</sup> to coordinate further.

The semi-permanent TDG measuring station is now operational at the hatchery. It can be accessed by searching for *dhci* at the “data query” tab on the TMT web site.

There was a request for a Unit 3 update. Steve noted that they have concerns over the quality of the rods and have sent them out to Canada for testing. He said that he would provide an update after they’ve decided on the rods.

#### Spill Priority Lists

Dan Turner, Corps, provided two spill priority lists: a transition SPL (pre-TDG waivers) for March 23-31<sup>st</sup> and a SPL for April 1-August 31. The order of spill priority for both date ranges are the same as in previous years, starting at Lower Granite and moving sequentially downstream to Bonneville. The SPL order will be implemented on March 23<sup>rd</sup> and April 1<sup>st</sup>, however, if there are changes requested based off of FPAC review, they can be discussed at TMT and implemented as agreed on. They will be on the FPAC agenda for discussion next week and FPAC will bring any input back to TMT. Erick asked how the Corps determines the spill cap example. The Corps noted that the spill cap examples are derived from daily spills and change daily.

→ ACTION: FPAC will review the list and bring any suggested changes to the priority order to TMT next week.

## Operations Review

*Reservoirs* – Mary Mellema, BOR, presented figures from Bureau of Reclamation projects:

- Hungry Horse: 3,540 ft. mid-night elevation, with 3.0kcfs inflow and 5.0kcfs outflow.
- Grand Coulee: 1,254.1 ft. and drafting; drumgate maintenance has started

Lisa Wright, Corps, presented Corps projects:

- Libby: 2,394.7 ft. mid-night elevation; with 4.3 inflow and 4.0kcfs out
- Albeni Falls: 2,053.2 ft. mid-night elevation; 30.5 inflow and 22.5 out
- Dworshak: 1,506.96ft mid-night elevation, with 19.7 kcfs inflow and 22.4 kcfs discharge
- Lower Granite: average outflows are 144 kcfs
- McNary: average outflows are 282.7 kcfs
- Bonneville: average outflows are 320.6 kcfs

*Fish* -- Paul Wagner, NOAA, reported on fish. He referred to postings on the FPC web site. Early steelhead are underway, and winter steelhead are wrapping up. There are a few Spring Chinook at Bonneville, but it is early in the season. In regards to juveniles, some smolt monitoring traps are operating. The higher flows will make for an interesting year, there may be an early and large juvenile run. Lamprey had an initial surge, and then fell off.

*Water Quality* – Dan Turner, Corps, reported that TDG levels in the system are between 111 and 122%. The Warrendale gauge is back in service. There has been daily spill at projects, which is rare for March. Temperature gauges at Lower Granite are being installed and should be operative by the warm water season.

*Power System* – Tony Noris, BPA, shared that there was nothing to report.

**The next TMT meeting is a conference call at 1:30 PM on Friday, March 17, 2017.**

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

**March 15, 2017**  
Minutes: Pat Vivian

***1. Introduction***

Representatives of the COE, BPA, NOAA, Washington, Idaho, Nez Perce Tribe, Warm Springs Tribe, Oregon, BOR, Umatilla Tribe, Yakama Nation, USFWS and others participated in today's TMT conference call to discuss the inflow situation at Dworshak Dam. Doug Baus, COE, chaired the meeting and Emily Stranz, DS Consulting, facilitated the conversation.

***2 Review Meeting Minutes – Feb 15, 22, March 1, 3***

Paul Wagner, NOAA, made two small changes to the February 15 official minutes. In scenario 1, 2.5 kaf should be 2.5 maf, and 33,000 ft should be 3300 ft. With these changes, all minutes and facilitator's summaries for these meetings were deemed final.

The facilitator's notes and minutes for March 8 and 13 will be reviewed at a later date.

***2. Dworshak Update***

Steve Hall, COE Walla Walla, walked TMT through several links to today's agenda and led a discussion of Dworshak operations.

**2a. Current Operations Data.** Dworshak reservoir elevation is currently at 1507.4 ft steadily discharging 22.5 kcfs, with 5 kcfs of that through the powerhouse and the remaining 17-18 kcfs as spill through the RO gates.

Average inflows are 19 kcfs. Since yesterday, inflows have been steadily increasing – from 14 kcfs yesterday morning to 21 kcfs at the end of the day. Inflows were up to 32 kcfs as of 700 hours today. The RFC is still predicting peak inflow of 70 kcfs tomorrow, although today's precipitation forecast is down to 0.5-1 inch, with most of the basin at 0.5 inch. The 10 day forecast indicates precipitation over the next 4 days, then a dry spell followed by another wet spell.

**2b. Total Dissolved Gas Report for Dworshak.** Yesterday's highest TDG reading was 126% in the river. Variations are mainly the result of changes in barometric pressure, Hall said.

Hatchery managers reported how the fish are faring with such a high level of spill. Mark Drobish, Dworshak National Fish Hatchery, reported that TDG levels are currently 104.8% in the hatchery, up from 104.6% yesterday. The degassing equipment works – but the presence of gas bubbles is increasing in both the number of fish affected and the number of locations in which bubbles are being seen, Steve Rogers, Dworshak Hatchery, added. Both spring Chinook and steelhead smolts are affected.

Dave Statler, Nez Perce Tribe, asked, what the TDG would be if Dworshak Dam had full powerhouse generation capacity of 10 kcfs rather than the current 5 kcfs of generation capacity? It would be less than 125%, Hall replied. The COE will look into historical TDG values when Dworshak Dam had full powerhouse capacity of 10 kcfs and had high levels of spill similar to the current operation.

The semi-permanent water quality monitoring station was successfully installed at the Dworshak hatchery and has begun generating TDG reports. It will provide ongoing real time data to the TMT website once the COE sets up an automated web page to collect the data. Until then, data are available on the TMT page via a water quality data query as “DHCI.”

**3c. NWRFC Water Supply Forecast.** Inflows at Dworshak are steadily increasing. Yesterday morning’s inflow rate of 14 kcfs rose to 21.4 kcfs by the end of the day and 32.2 kcfs as of 7 am this morning, Hall reported. The RFC inflow forecast for March 16 is 70 kcfs. Snowpack density at the Cool Creek SNOTEL site is 33% and at Shanghi is approaching 45% with a bit of a decline in snow water equivalent. Snowmelt is probably occurring at lower elevation SNOTEL sites around 4500 ft.

The COE’s early bird April-July water supply forecast for Dworshak is 2.965 maf – if there’s no more rain or snow for the rest of March which is highly unlikely. Extrapolating the increases since late February yields a 3.57 maf forecast. A more likely methodology yields a 3.26 maf forecast, but Hall said runoff could amount to more than 4 maf at Dworshak.

**3d. NWRFC Inflow Forecast.** The RFC has downgraded its forecast since the last TMT meeting mainly because a reduction in snowmelt is anticipated, Hall said. The RFC’s 10 day forecast is 2.49 maf, 103% of normal. The COE believes the forecast will continue to rise due to high elevation snowpack. Temperature is a big factor in snowmelt.

With Dworshak discharges currently at 22.5 kcfs, Julie Ammann, COE, said the COE is now in the process of declaring a system flood emergency because the Columbia River at Vancouver is forecasted to exceed 16 ft elevation which is flood stage. For the next few days, Dworshak discharges will remain at 22.5 kcfs in order to manage flows downstream.

Inflow forecasts are changing daily. The COE is watching the situation closely and managing variables such as – precipitation, temperature, inflows, and snowmelt. It’s likely that Dworshak discharges will increase to 25 kcfs next week. The channel capacity

is 25 kcfs, so the COE does not anticipate discharges any higher than 25 kcfs except in an emergency because flows in excess of 25 kcfs would cause property damage downstream.

**3e. Hatchery Update.** Hatchery managers gave an update on their plans for a possible early release under current conditions. IDFG managers are considering whether to release smolts from the Clearwater Hatchery earlier than March 27. Fish in the Dworshak Hatchery are not big enough yet for release but are smolting.

The hatchery managers expect to decide by March 17 whether to coordinate their releases on March 21-22 instead of later in the month. Clearwater Hatchery fish will be released directly into the north fork and Dworshak Hatchery fish will be released into the middle fork of the Clearwater River.

In preparation for the early migration, fish screens will be dropped starting March 20 at Lower Granite and Lower Monumental dams, and on March 27 at Ice Harbor, Ann Setter, COE Walla Walla, reported. Fish sampling will begin March 25-26 at Lower Granite and April 1 at Little Goose and Lower Monumental dams.

Tom Lorz, CRITFC, asked for an update on the Unit 3 repair at Dworshak. The contractor's schedule calls for return to service in July, Hall replied. However, in inspecting samples of the stator bars, the COE found serious deficiencies and is sending a team to conduct more detailed inspections. It is possible they will have to be remanufactured, which would delay the return to service by several months.

The hatchery managers requested a TMT meeting on Friday to touch base on whether discharges will be increased from 22.5 kcfs to 25 kcfs, and to coordinate the potential early release of spring Chinook. Tony Norris suggested releasing the fish while Dworshak discharges are being kept low so as to avoid the higher TDG levels that would be associated with increasing discharges to 25 kcfs on March 20 if that becomes necessary. Dave Swank, USFWS, said this week is too soon. The earlier the smolts are released, the lower their chances of survival.

If the Dworshak pool elevation reaches 1518 ft by March 20 as predicted, that will be almost a 10 ft rise in a few days when the elevation is supposed to be headed down to the flood control target, Ammann said. The COE has been planning to provide two days of 8 kcfs for the fish release and is committed to that plan – but it might become infeasible if the flood risk grows. TMT will meet again at 1:30 pm on March 17 for an update.

#### ***4. Spill Priority List***

Dan Turner, COE, presented two spill priority lists, one for March 23-31, the other from April 1 for the rest of 2017 spill season. The SPL will be implemented on March 23<sup>rd</sup>, however, if there are changes based off of FPAC review, they can be discussed at TMT and implemented as agreed on. They will be on the FPAC agenda for

discussion next week and FPAC will bring any input back to TMT. Due to the extent of involuntary spill on the lower Snake, the COE has been doing daily spill review, with spill caps readjusted daily.

Erick Van Dyke, Oregon, asked how to track the spill caps. Changes are posted to the link at the bottom of the spill priority list, Ammann said. Norris noted that the spill is due to lack of turbine, not lack of load. The first spill priority list will be implemented on March 23. FPAC will review the list and bring any suggested changes to TMT next week.

## ***5. Operations Review***

**5a. Reservoirs.** Baus and Mary Mellema, BOR, reported. Hungry Horse is at elevation 3540 ft with 3.0 kcfs inflows and 5.0 kcfs discharge. Grand Coulee is at elevation 1254.1 ft with drum gate maintenance under way.

Libby is at elevation 2394.7 ft, with 4.3 inflows and discharging 4 kcfs minimum flows. Albeni Falls is at elevation 2053.2 ft with inflows of 30.5 kcfs, discharging 22.5 kcfs. Dworshak is at elevation 1506.96 ft, with inflows of 19.7 kcfs and discharging 22.4 kcfs. Lower Granite discharges are 144 kcfs, McNary discharges are 282.7 kcfs, and Bonneville discharges are 320.6 kcfs.

**5b. Fish.** Paul Wagner, NOAA, reported. *Adults:* Steelhead passage is wrapping up with some holdovers from last year at the upper river projects. Lower Granite has many steelhead that overwintered. It's still early for spring Chinook, with Bonneville seeing 8 returns to date.

*Juveniles:* Collection and sampling has started at various sites, although Bonneville is the only project with fish screens in yet. Smolt monitoring traps are collecting some fish already – 548 at Lower Granite. An initial surge of 5,000 lamprey has fallen off.

**5c. Water Quality.** TDG saturation levels are ranging from 111% to 122% at the lower Snake and lower Columbia projects, Dan Turner, COE, reported. Warrandale gage is back on line after repairs. Forebay gages are already installed at Lower Granite and Ice Harbor, and the COE's water quality team is doing daily spill review which is highly unusual in March.

Charles Morrill asked about the status of the new temperature data collection station in Lower Granite pool. It's in progress now, with a goal of collecting data when warm weather starts, Hall replied. Spill at Granite is generating 122% TDG due to lack of turbine. The missing turbine will be returned to service in the next 4-6 weeks, Ann Setter, COE Walla Walla said.

Jay Hesse, Nez Perce Tribe, noted that Hells Canyon is spilling 135% TDG and Idaho Power is also coping with high TDG levels and adverse impacts on fish.

**5d. Power.** There was nothing to report today

### ***6. Next TMT Meeting***

TMT will meet next at 1:30 pm on Friday, March 17 for an update on the inflow forecast and hatchery release plans.

<b><i>Name</i></b>	<b><i>Affiliation</i></b>
Julie Ammann	COE
Doug Baus	COE
Lisa Wright	COE
Laura Hamilton	COE
Tony Norris	BPA
Dan Turner	COE
Paul Wagner	NOAA
Ron Thomason	COE
Charles Wiggins	DSC facilitated the meeting
Charles Morrill	Washington
Dave Swank	USFWS

#### ***Phone:***

Russ Kiefer	Idaho
Jay Hesse	Nez Perce
Dave Statler	Nez Perce
Jen Graham	Warm Springs
Erick Van Dyke	Oregon
Mary Mellema	BOR
Tom Lorz	CRITFC/Umatilla
Dave Benner	FPC
Margaret Filardo	FPC
Steve Hall	COE Walla Walla
Scott Richards	Snohomish PUD
Julie Potter	Snohomish PUD
Pete Lyman	PGE
Michael Bryant	CBB
Tom Iverson	Yakama Nation
Ann Setter	COE
Laura Berg	Clearing Up
XX	Chelan PUD
Mark Drobish	Dworshak Fish Hatchery
Steve Rogers	Dworshak Fish Hatchery