

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

March 8, 2023

Facilitator's Summary

Facilitation Team: Emily Stranz & Nancy Pionk, 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; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: <http://pweb.crohms.org/tmt/agendas/2023/>. Suggested edits for the summary are welcome and can be sent to Nancy at nancy@dsconsult.co.

Review Meeting Summaries & Minutes – TMT Members approved the February 22 and March 1 meeting minutes and facilitator's summary, with no additional edits.

Official Water Supply Forecasts - Joel Fenolio, Reclamation, reported the official March water supply forecast for Hungry Horse Dam. The residual March through July forecast is 1,950 kaf, or 93% of average. April through August is 96% of average and May through September is 99% of average. Joel noted a trend of colder temperatures, with the snowpack expected to hold on until May or June and snowpack levels ranging from average to above average levels.

Doug Baus, Corps, reported official March water supply forecasts for Corps of Engineers projects:

- **The Dalles:** NWRFC April to August volume forecast is 74 maf, or 83% of average;
- **Lower Granite:** April to July volume forecast is 16 maf, or 80% of average;
- **Libby:** Corps March runoff forecast April to August is 5,298 kaf, or 87% of average; and
- **Dworshak:** NWRFC March runoff forecast April to July is 2,344 kaf, or 95% of average

Chum Operation – Doug Baus, Corps, reported that, as of last Thursday, the Corps began operating the Bonneville Dam minimum tailwater elevation to 10.2 feet on all hours. Doug noted that this operation change had an impact in both total outflow and project tailwater elevation. Total outflow for March 8, hour 0600, was 115.8 kcfs and the project tailwater elevation was 10.4 feet. Prior to the change, the minimum tailwater elevation was 11.8 feet.

Looking ahead, the NWRFC inflow forecast for Bonneville Dam shows inflows into the project ranging from 105 kcfs to 120 kcfs over the next 10-days. The NWRFC extended forecast for Bonneville Dam 120-day outlook is well below 50% climatology. The current forecast for March shows low precipitation and water supply forecasts are showing low project inflows. According to the 10-day QPF, some areas are forecast to get above average amounts of precipitation, however, when quantified into inches, it will be relatively low and not enough to relieve the water year deficit.

Doug reviewed the Water Year Precipitation Summary Table and noted that, while precipitation in the 10-day forecast period is occurring in the region, the observed precipitation across the Water Year (October 1, 2022 to current) is below normal conditions. Specifically,

- In the Snake River above Ice Harbor Dam, the observed precipitation is 81% of normal.
- The Upper Columbia River is experiencing below average conditions.
- In the Columbia River Main Stem above the Dalles, the observed precipitation is 73% of normal.
- Low precipitation values in Western Oregon are another variable as the Willamette can help bolster the Bonneville Dam tailwater. For the Willamette River Basin above Portland, precipitation values are 65% of normal.

Tony Norris, BPA, noted that Bonneville Dam currently needs inflows of 110 to 115 kcfs to produce tailwater elevations of 10.2 feet, or slightly above. BPA continues to draft Grand Coulee to support the 10.2 feet. elevation; however, inflow to Grand Coulee is still insufficient to support a higher tailwater of 11.8 feet. He noted that an atmospheric river is in the forecast for next week, with below average temperatures that will be closer to average temperatures for this time. This weather event is forecasted to produce some increases in stream flows, which may result in slightly better conditions for chum for a period of time. He noted that the 10-day forecasts for the Willamette River at Salem, the Snake River at Lower Granite and the Hood River near Tucker Bridge all show an increase in stream flows which indicates there could be an increased flow into the Bonneville pool. The increase in the flow in the Willamette will decrease the flow rate needed to produce a specific tailwater at Bonneville Dam. The 10-day weather forecast also shows the forecasted maximum temperatures will be a bit warmer while the nighttime minimums will not be as cold as they have been.

The AAs will continue to operate to preserve water in the system and at Grand Coulee and to operate the Bonneville Dam tailwater between 10.3 and 11.8 feet, when possible, to take advantage of this natural increase in flow to provide better conditions for migrating chum. He cautioned that there is a lot of uncertainty as to what actual flow response will occur and what the conditions will be like after this weather event. Tony will be visiting the area with WDFW on Thursday to take water surface elevations adjacent to redd locations previously identified in 2022.

In response to an inquiry from Jay Hesse, Nez Perce, Tony noted that the chum spawned in areas of upwelling and consequently, it is not certain that the redds have been completely desiccated; BPA is operating on the assumption that some fish have yet to emerge from the redds and would benefit from having a better egress path to the river. Charles Morrill, WA, added that other factors at play are the location of the redds and whether there is inter-gravel flow to support those fish; any additional flow will enhance the opportunity for fry to emerge out and move downstream. He noted that emergence is ongoing, and fry have been observed coming out of Duncan and Hamilton Creeks. Tony noted that any tailwater above 10.2 – 10.5 feet would allow flow to pass over the upstream bar and to pass between Ives Island and Hamilton Island. Charles noted that there is a lot of low elevation snow in the lower Gorge, and if there is additional wet, warm weather, the area will see a lot of runoff. Charles will attempt to get data from the crews that are running the traps and share the data with TMT.

Erick Van Dyke, OR, noted that peak flow/flash flood events have been known to impact redds negatively. He added that the operations being discussed are water management operations and not natural flow dynamics. Tony noted the relative change in the Ives Complex would be incremental, not flooding, however, conditions could be turbulent for fish in Hamilton Creek due to the elevation changes. Hamilton springs is not expected to fluctuate.

Jonathan Ebel, ID inquired whether the survey might provide some quantification of potential desiccation. Tony noted that while it is not possible to quantify the level of desiccation, the survey will provide water surface elevations and photos of the locations. Charles noted that in areas where it appears redds are below the current water levels, it might be possible to check for inter-gravel flow.

An additional TMT meeting has been scheduled for March 15 to provide an update to TMT members on field conditions.

Operations Review – Reservoirs: Joel Fenolio, Reclamation, reported on Bureau of Reclamation projects:

- **Hungry Horse:** midnight elevation was 3,517 feet; the project has been releasing approximately 3.3 kcfs to support 4000 cfs downstream at Columbia Falls to help with Montana Fish and Game fish surveys. Surveys are ongoing for two more days and then flows will be reduced.
- **Grand Coulee:** midnight elevation was 1,255.7 feet; the project has been operating to support the 10.2 feet tailwater elevation at Bonneville Dam, with releases averaging 68,000 cfs over the last five days and inflows averaging 54,000 cfs,

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

- **Libby:** midnight elevation was 2,405 feet, with average inflows of 2.1 kcfs, and outflows of 4 kcfs;
- **Albeni Falls:** midnight elevation was 2,051.3 feet, with average inflows of 10.8 kcfs, and outflows of 9 kcfs;
- **Dworshak:** midnight elevation was 1,519.6 feet, with average inflows of 1.5 kcfs, and outflows of 1.7 kcfs;
- **Lower Granite:** average outflows of 20.7 kcfs;
- **McNary:** average outflows of 95.6 kcfs; and
- **Bonneville:** average outflows of 108.8 kcfs

Water Quality – Dan Turner, Corps, provided an update on water quality. He noted that adult steelhead spill began earlier this month in the Snake River and McNary, and gauges show up to 111% TDG at Lower Monumental. Downstream (tailwater) water quality criteria is 120% TDG and projects are not exceeding criteria.

Downstream at Bonneville Dam, the Warrendale gauge is reporting 104-105 % TDG. Dan noted that the water quality standard in this area is 110% TDG; however, due to low tailwater downstream of Bonneville, the Corps has determined that ODEQ's shallow water TDG criterion is applicable. This criterion provides that the water quality standard is 110% TDG, "however, in hatchery receiving waters and other waters of less than 2 feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 105% saturation." Thus far, TDG levels have not exceeded 105% at the Warrendale gauge.

Dan also reviewed information concerning the Bonneville Dam Powerhouse Corner Collector 2 (BCC2) which began operating for four hours a day beginning March 1. Since the operation began, the Corps has observed daily cycling of TDG and is seeing a 2-3% increase in TDG throughout the day about four-five hours after opening the BCC2. This amount of TDG is within expectations of what would be produced by the corner collector. Dan noted that the BCC2 operates from 6 AM to 10 AM and the TDG levels peaked to 105% at 6 pm. Starting on Thursday, March 9, the B2CC is scheduled to be open for two daily 4-hour blocks of operations. Based on experience, the Corps expects to see an exceedance of 105% at some point in the future.

Dan shared this information for situational awareness; the Corps is not suggesting any changes in operations at this point. The Corps is exploring possible options to reduce TDG levels including closing the ice and trash sluiceway (which is operated 24 hours a day and is suspected to add to TDG), and closing or minimizing Bay 1 which is currently open 24 hours a day during repair work at Bradford Island. It is expected that the work will be completed soon, at which time Bays 1 and 18 will be operated during daytime hours according to the Fish Passage Plan. Further, the BCC2 is operated by touch button and one possible option is to shorten duration of the opening and operate in 2-hour blocks to disperse TDG levels. Dan understands that FPOM may be discussing the BCC2 operation on Thursday.

TMT Members shared the following questions and comments regarding the Water Quality report:

Jonathan Ebel, ID inquired whether the Warrendale gauge data would be applicable to areas with shallower water and whether the TDG levels might disperse and be lower with more depth, given the reaeration rate. While more reaeration is expected with shallower water, the Corps' conservative assumption is that the levels reported at the gauge would be applicable to areas with shallower water.

Tom Lorz, CRITFC, suggested that the BPA and WDFW chum surveyors take TDG samples when in the field on Thursday. Charles will explore whether this is possible.

Jay Hesse, Nez Perce, inquired what water flows would be needed to get outside the shallow water criteria. Dan answered that this is not clear as there is much diversity of habitat to consider. Jay also asked whether the Corps

and ODEQ have had a discussion regarding the interpretation of the ODEQ shallow water criteria, and if they need any support. Per Dan, the Corps has not had direct communications with ODEQ yet, the Corps is relying on the Corps' legal team's interpretation of the standard.

Trevor Condor, NOAA, noted that the 110% standard has typically been used and asked whether the interpretation of the shallow water criteria was novel for this year or if there is record of using it in previous years. Tony indicated that the adjustments have been made in the past to manage for TDG. For example, in 2020, when spill started at Bonneville, and was expected to run close to an 11.5 feet tailwater after April 10, the Corps had received requests to adjust the tailwater an additional foot higher to protect against shallow water TDG impacts.

Trevor noted that it was likely that there would be redds in shallow water of less than 2 feet, whether the tailwater elevations were 10 feet or 11.8 feet. and sought more clarification on the rationale for shifting to the shallow water criteria. Scott Bettin, BPA, noted that use of the shallow water criteria is not new, and has been used as far back as 2000. This year, the flows are exceptionally low, and when the tailwater elevation drops, the BCC2 produces more TDG because it plunges further. These circumstances only become apparent when there is low tailwater and no depth compensation. The Corp's application of the standard in the past is that when the fish are in the redd and can't move, the standard is 105%; once the fish emerge, the standard is 110%. Julie Amman, Corps, noted that the shift to the shallow water criteria standard was made earlier this year than in previous years, and earlier in the emergence phase; the Corps has not observed these conditions in the past and is attempting to be proactive.

Emily noted that in 2022, when the TMT considered interpretations of water quality standards, the Corps shared their perspective on how to interpret the water quality standards and FPAC wrote a letter directly to the water quality agency and helped clarify any misunderstandings of how to interpret those criteria. She suggested this might be an approach for TMT to consider for clarifying interpretation, if needed. Erick requested that the Corps reach out to ODEQ directly to get clarification, noting that the rules require that agencies contact ODEQ. David Gruen, ODEQ noted that, while he is not able to provide a definitive statement about the interpretation of the shallow water criteria at this TMT meeting, he is available to have conversations with the Corps and Action Agencies and to provide OR's interpretation of the WQ standard.

As next steps,

1. Dan will reach out to the Corps' policy and legal team to get their guidance about a possible conversation with ODEQ.
2. Julie suggested that it could be helpful for FPAC to also provide a request for clarification in writing. The Corps will clarify whether this should be in the form of a letter or email, after it has consulted with the policy and legal team.
3. Given the short timing, the Corps will provide an update at the FPOM meeting on Thursday, if available, and at the March 15 TMT meeting.

Fish - Trevor Condor, NOAA, provided an update on Fish.

Juveniles: Data collection on yearling Chinook began on March 3, with 17-54 yearlings counted so far. The PIT-tag history of these fish revealed that many of these fish came from a 2/6/23 release from the Klickitat Hatchery, in an effort by the hatchery to reduce density. For sub-yearling Chinook, over 100 a day are going through. One PIT-tagged fish was a Clearwater fall Chinook holdover from 2022. A few coho have also gone through. There are some projects on the Snake River that are open early; however, there are no data available yet.

Adults:

- Bonneville is showing 2 Chinook adults; however, 1 fish was detected around January 1, and is likely a late fall Chinook. Steelhead numbers are still low, with less than 20 moving through.
- McNary is not operating yet.
- Ice Harbor: 10 or less steelhead observed going through.

- Lower Granite: 30 steelhead observed on March 1. The RSW is opening for the overshoot operation and up to 20 fish have been detected so far. Many of those fish were originally tagged at Lower Granite. While it is difficult to determine the origins for a majority of the fish, a few were identified as coming from Tucannon River, Touchet River, and John Day River. Trevor noted that these data indicate that the operation is somewhat effective at moving overshoot fish through the projects. Each PIT-tagged fish represents several more untagged fish that have passed.

Power System - Tony noted that, with below average temperatures, the energy demand remains relatively high this time of year, with not a lot of water available. There has not been much generation of variable energy resources; this is expected to change next week.

Other TMT Communications - Brian Marotz, MT, thanked Reclamation for coming to Hungry Horse Dam last week for a face-to-face meeting; Reclamation has set up annual coordination meetings with FWP.

Question and Comments from members of the public – There were no questions or comments from members of the public.

The next scheduled TMT meeting is on March 15, 2023 at 9:00 AM.

**Columbia River Regional Forum
Technical Management Team
OFFICIAL MINUTES
Wednesday, March 8, 2023
Minutes: Andrea Ausmus, BPA (contractor, CorSource Technology Group)**

Today's TMT meeting was held via conference call and webinar, chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. A list of today's attendees is available at the end of these minutes.

1. Review Summaries and Minutes – February 22 and March 1

- Approved February 22 and March 1 summaries and minutes

2. Official Water Supply Forecast – Joel Fenolio, BOR & Doug Baus, Corps NWD

March

a. Hungry Horse

- March – July
 - 1950 kaf
 - 93% of average
- April – August
 - 96% of average
- May – September
 - 99% of average
- Seeing a trend of colder temperatures holding onto the snowpack until May or June.
- Saw a drop off after issue but after the weekend storm will be back to average or above average levels in the Flathead basin.

b. The Dalles

- April – August
 - 74 maf
 - 83% of average

c. Lower Granite

- April – July
 - 16 maf

- 80% of average
 - d. Libby
 - March Runoff Forecast (April to August)
 - 5298 kaf
 - 87% of average
 - e. Dworshak
 - April – July
 - 2344 kaf
 - 95% of average
- 3. **Chum Operation – Doug Baus, Corps-NWD; Tony Norris, BPA; Joel Fenolio, BOR, and; Kelsey Swieca, NOAA Fisheries**

Current Chum Operation at Bonneville has been set to 10.2 feet minimum on all hours – began on Thursday (March 2, 2023).

- a. Bonneville Dam - Hourly Data – *Doug Baus, Corps (Hour ending 6)*
 - Total Project Outflow: 115.8 kcfs
 - Project Tailwater Elevation: 10.4 feet

The prior minimum tailwater elevation was 11.8 and it was reduced to 10.2 ft starting last Thursday. The reduction is reflected in the Project Tailwater Elevation hourly data, as well as a reduction in outflows.
- b. Bonneville Dam – 10-Day NWRFC Inflow Forecast
 - Inflows: 105 – 120 kcfs
- c. 120-day NWRFC Inflow Forecast
 - Well below 50% climatology
- d. NWRFC Forecasted Precipitation Summary
 - 10-Day Forecast Precipitation
 - 10 Day QPF
 - There are areas of well above average amounts of precipitations (150 - 175% of average)

- When quantified into inches the percent of average precipitation is relatively low.
- S. Central Idaho –from 0.2 - 2 inches
- While getting above average precipitation, it is not getting us out of the deficit for the water year.

e. NWRFC – Water Year Precipitation Table (October 1 – March 7)

- Snake River – above Ice Harbor Dam
 - Observed: 10 in.
 - Normal: 12.2 in.
 - 81% of Normal
- Upper Columbia Basin – above Arrow Dam
 - Observed: 22.1 in.
 - Normal: 29.2 in.
 - 75% of Normal
- Columbia River Main Stem – above The Dalles
 - Observed: 11.3 in.
 - Normal: 15.4 in
 - 73% of Normal
- Western Oregon – Willamette River Basin above Portland
 - Observed: 29.2 in.
 - Normal: 45.3 in
 - 65% of Normal

The Willamette can help bolster the Columbia River Mainstem. When the water is not there, it does not provide the benefit. More water needs to come from above Bonneville Dam to provide the tailwater elevation.

f. Willamette Forecast – Tony Norris, BPA

Norris shared that the current 110–115 kcfs outflow from Bonneville is required to produce a Bonneville tailwater elevation of 10.2 ft (and slightly above). They are continuing to draft Grand Coulee to support the tailwater elevation. As it is now enough water cannot be released within the draft limit from Grand Coulee to support a tailwater of 11.8 ft.

- An atmospheric river is in the forecast in the coming days. This system is expected to have below average temperatures but closer to average. It is expected to hit the basin sometime next week. There is uncertainty of what will come out of the event.

- Willamette – At Salem (SLMO3) Forecast
 - Correlates to the need of water out of Bonneville Dam to produce a specific tailwater.
 - The 10-day forecast for the Willamette shows a significant bump in flow and as a result they expect the required flow from Bonneville to be reduced for a period.
 - Not sure how long increase in flow will last.
- Snake - Lower Granite Dam Forecast
 - Flow in the Snake River is currently around 20-21 kcfs inflows
 - The 10-day forecast shows a response to precipitation of approximately 35 kcfs. There is no certainty if this rise will sustain after the event has passed the basin
 - Any increment in additional flow from the Snake River can contribute to higher tailwater at Bonneville Dam
- Hood – Near Tucker Bridge (HODO3) Forecast
 - The 10-day forecast for the Hood River does not show a lot of flow but is an indicator the type of streamflow response we might see into Bonneville Pool for some period of time during the precipitation event.
- 10-day forecast
 - Max and Min Temperatures
 - Tuesday (March 15, 2023)
 - Starting to see max temperatures warmer.
 - The nighttime minimums are not as cold.
 - Monday (March 14, 2023)
 - Snow level lifting.
 - This system may put us back to normal.
 - Should expect to see some responses in the Willamette, incrementals for (Bonneville, Lower Granite, Hood River)
- Hopefully, this leads to a more sustained response from the Snake River.
- Due to an increase in streamflow they expect to operate (try to preserve water) at higher tailwater levels between 10.5 – 11.8 ft. without significant increases in draft at Grand Coulee.
 - Still uncertainty of the event and after the event passes
 - May see slightly better conditions next week for chum.

Kelsey Swieca, NOAA, asked if Norris was able to get out and do the survey as he had expected in the last meeting.

Norris is heading out tomorrow with Washington Department of Fish and Wildlife. They have access to a boat and they will be out to collect as much water surface data as is

pertinent to current operations. Tomorrow will still be under the current conditions so the worst case will be measured. He hopes that with the atmospheric river provided better conditions for chum next week.

Swieca looks forward to that information.

Jay Hesse, Nez Perce, asked Norris if his glimmer of hope conditions is applied to conditions that help successful chum fry disperse downstream or is it beneficial for redds that have been or will desiccated from lower flows.

Norris responded that there is uncertainty on whether a redd or a fish that has not yet emerged from its redd is desiccated. The fish spawn in areas that have upwelling water, that upwelling water did not stop with the tailwater. In some areas, potentially, it was diminished; there is a diversity of areas that these fish have spawned. There is still a possibility that providing a higher tailwater when there is some extra flow will provide a benefit to some of the fish that have not yet emerged from their redds and thus provide a better egress path. Some of the areas, like the Ives Pocket there is water pouring out of the gravel, it is conceivable that even without being inundated by the tailwater they would have a path to the river, it would be better to be inundated with water so they did not have to follow very shallow streams of water to the river. The fish are still emerging so it would follow that if the days ahead provide some inundation they would find more success. There is a chance too that they were desiccated but that is not a certainty.

Charles Morrill, WA, added that depending on the redd location and its local elevation, and if there is inter-gravel flow, there is no way to know the total impact. Any warming, and any additional flow will enhance the opportunity for fry to get out and move downstream. They are seeing fry coming out of Duncan and Hamilton so the emergence is ongoing. Any bump would be good to have.

Norris added that the elevation of 10.2 – 10.5' is notable. Any tailwater above will allow flow to pass over the upstream bar that would allow water to pass between Ives Island and Hamilton Island and allow fish better egress paths.

Morrill said that the lower elevation snow in the lower gorge and if there is wet weather then there is a chance for runoff.

Erick Van Dyke, OR, asked Charlie Morrill about his quoting of observational data; he would like it shared so that he can quantify statements made.

Morrill said that this is feedback from the crews doing the work. He will look to get the information from the traps but is not sure how fast that could be made available.

Van Dyke also commented that a possible flash flood event, a peak flow of flash warming from water stored in snow, has been known to negatively impact redds. There is a lot of commentary on what to expect. The details that it impacts need to be explored by the group.

Norris said that in the context of a steep stream, a flash flood could cover redds with sediment or scour them but that is not relevant for this location. In this case, the relative

change in the Ives complex would see would be incremental and typical for what they would see. In Hamilton Springs, the fish never see a flash event, the flow is much steadier, but once they leave the springs and enter Hamilton Creek they will see a better outcome. The Hamilton Creek is the path of egress from Hamilton Spring to Hamilton Creek may see a flash flood event. Ives would not see a flood event; it would only see a change in flow.

Van Dyke said that he appreciates Norris sharing how water is managed but part of the details being delivered is about how nature delivers flow. He said that most of what Norris shared is not on a natural hydrograph. When water increases and there are fish that are prepared to move they will, if the water is available, they may or not move. He said that Norris is not quantifying much except the water.

Emily Stranz shared a recap of the discussion.

- We will look forward to Norris' findings in the field.
- If the water comes through with the atmospheric river, it could support the stream flows, and it is possible to see an increase of the Bonneville tailwater up to 11.8' if possible.

Baus said that the Corps added another meeting for next week, March 15, 2023.

Jonathan Ebel, ID, said that if there is another meeting next week on chum operations he expects the survey data will have quantifiable data on potential desiccation. He asked, if otherwise, what of TMT's capacity could be applied.

Norris said that he hopes that he would have that data back from BPA's surveyors. He would be able to provide the water surface elevation adjacent to the redds identified in December. This does not capture every single redd and depending on where the fish spawned and how much water they are experiencing through the gravel the data will not show whether they are desiccated or not. He will be able to provide elevations in relation to the redds identified. He will be able to provide this information in a similar method as in the past. He will also try to provide some photos to share what it looks like visually.

Ebel said that it is helpful to know but it is still mostly guessing. He is surprised that no one has thought to add emergence straps to some of the redds to answer some of the questions. His overall thought is that there is not much to do besides document the impact and does not believe that it is a TMT function. He does not see what the action agencies are able to do given the forecast and the redds have been dewatered for two weeks.

Stranz responded that the meeting would be an update and not an action. She asked if TMT members are interested in the update.

Ammann said that it should be revisited at the end of the meeting after all the information is available.

Morrill said that one thing to that could be done is that when the survey is done by WDFW in areas with inter-gravel flow they could look to see how much of that flow is present by digging down. He will talk to the crew and Norris to look at the exposed areas.

There is an ability to identify the elevation near that. Redds are typically a foot under the gravel, there still may be water. Water could be beneficial for them. May have lost some eggs and fry could have been lost but there could be enough to water to allow the fry migrate with inter-gravel flow. Norris has shown that there is ground water that seeps up through the gravel and there is a chance that the fish could survive in those conditions.

Norris said that as a caveat, every location that chum have spawned is different, and the conditions could be different from one place to the next. They will be able to see the inter-gravel flow but not verify at every location.

Morrill agreed but in areas where redds have been exposed it is possible to dig in a little to see the inter-gravel flow. He did say that it would be observational only.

4. Operations Review

a. Reservoirs

Reclamation – Joel Fenolio

- Hungry Horse Dam (Hour ending 8)
 - Midnight elevation: 3516.79 ft.
 - Releasing Average Outflows: 3.3 kcfs
 - To support 4000 cfs or higher at Columbia Falls
 - Help support Montana Fish and Wildlife and Parks fish surveys, they are surveying tonight (March 8) and tomorrow (March 9).
 - After the surveys are complete they will reduce back to Columbia Falls minimums but they will have to keep the flows up through Monday and reduce down on Tuesday.
- Grand Coulee Dam
 - Midnight elevation: 1255.7 ft.
 - Inflows: 54 kcfs
 - Outflows: 68 kcfs
 - Operating to support 10.2' below Bonneville.

Corps – Lisa Wright

- Libby Dam
 - Midnight elevation: 2405 ft.
 - Inflows: 2.1 kcfs
 - Outflows: 4 kcfs
- Albeni Falls

- Midnight elevation: 2051.3 ft.
 - Inflows: 10.8 kcfs
 - Outflows: 9 kcfs
 - Dworshak Dam
 - Midnight elevation: 1519.6 ft.
 - Inflows: 1.5 kcfs
 - Outflows: 1.7 kcfs
 - Lower Granite average outflows: 20.7 kcfs
 - McNary average outflows: 95.6 kcfs
 - Bonneville average outflows: 108.8 kcfs
- b. Water Quality – Dan Turner, Corps
- i. TDG Tracking
 - Snake and McNary
 - Adult steelhead passage spill started this month.
 - There was a response of TDG: 111% at Lower Monumental
 - There were conversations last fall and clarification from Washington’s Department of Ecology that the TDG standard during steelhead spill is 120% in the tailrace.
 - The 120% is now reflected in the Gas Cap Criteria.
 - ii. Warrendale Hourly TDG
 - Yesterday (March 7, 2023) WRNO showed TDG levels of 104-105%
 - The TDG standard is 110%.
 - Due to low tailwater downstream of Bonneville Dam, the shallow water TDG criteria (Oregon) are applicable:

“However, in hatchery-receiving waters and other waters of less than two feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 105 percent of saturation.”
 - Starting on March 1, the B2 corner collector started operating 4 hours a day.
 - Daily cycling of TDG is happening 4-5 hours after.
 - 2-3% increase of TDG is happening after opening the corner collector.
 - This amount is expected based on a mass balance calculation.

- Tomorrow the B2 corner collector is scheduled for another 4-hour block of operation (two 4-hour blocks each day).
 - Through Turner’s experience, he expects to see an exceedance of 105%.
 - There is already a background concentration of natural TDG fluctuation.

February 21: 103% TDG

February 25: 99% TDG

- Overlaying the B2 Corner Collector will likely lead to exceeding 105% TDG.
- Currently the Corps is not suggesting a change to operations. This was informational to make sure all were aware of the conditions and operations.
- They have already begun to brainstorm for what is possible in terms of change.

Ideas in the past:

- Closing the powerhouse 1 ice and trash sluiceway as it is suspected of adding to TDG.
- Typically, Bays 1 and 18 are open during daytime hours for attraction flow, currently only Bay 1 is open 24-hours/day. This is another producer of TDG that could be closed and minimized.
- B2 Corner Collector is operational by push button in the control room. It is possible to shorten the duration of the opening and do a 2-hour block instead of the 4-hour block to minimize TDG.
- Turner has heard that this will be a topic of conversation at FPOM tomorrow (March 9, 2023).

Van Dyke asked what hour 105% TDG occurred and when the corner collector is running.

Ebel said that it is peaking at 6 pm.

Turner confirmed and said that the corner collector is running from 0600 – 1000.

Van Dyke asked what hours for attraction spill.

Turner said that Bay 1 is open 24 hours a day.

Van Dyke asked for the hours of the sluiceway operations.

Turner said that it is open 24 hours a day.

Van Dyke said that it would need to be looked into, as it was not how he had remembered. He believed that they were a block of time during a certain time of the day.

Bettin said that they are on 24 hours. Only reason for spillbay 1 is open 24 hours a day is for work at Bradford Island occurring. It is on for attraction during day but are unable to turn it off because of the clearance. The work should be done soon and bays 1 and 18 will go back to being open during daytime hours, per the FPP.

Ebel asked Turner about the two feet of depth and he asked about the depth of the water at Warrendale gauge. He wondered if it is applicable to the water quality regulations for the areas that Oregon DEQ is concerned about that are two feet deep.

Turner said that the only location for the gauge available is Warrendale. He agrees that it would be ideal if there were a TDG gauge right over a redd. At this point the gauge in Warrendale, it is the only data available and they are using it to make assumptions that the data are representative of the environmental conditions at spaces that are shallower.

Ebel said that give the dependence of a reaeration rate on depth it would be assumed that it would equilibrate at a lower TDG. The more shallow the more distant from the source of gas.

Turner agreed that it depends on environmental factors but generally the estimate of reaeration. Expect more reaeration with shallower water. This is a conservative reaction, saying that the TDG of Warrendale is applicable.

Ebel said that it is extremely conservative and he is not sure that it applies.

Tom Lorz, Umatilla/CRITFC, asked as there are people going out in the field if they could take some TDG measurements at the redd locations. The greatest risk would be Ives Island and it would useful to take a TDG monitor to check if the Warrendale gauge is applicable.

Norris said that he does not believe that it would be that simple because of the need to calibrate the gauge.

Lorz said that it is done when they are doing fish sampling. He wondered if WDFW could have the capability

Morrill said that he would find out.

Hesse asked Turner if it was the low water years triggered the low water criteria, and if so he was curious as to the water flows that would be required to be outside of the criteria.

Turner said that the low tailwater brought to attention the low depths over the redds and the standards for depths below two feet. He is not sure what it would take to reverse the criteria. There is a low of diversity of habitat. Turner is not sure.

Hesse asked if the interpretation of the shallow water criteria had been discussed between the Corps and Oregon DEQ. He sees a similarity of the concerns of interpretation that was worked out with Washington. Hesse asked if there are direct communications and if they require help to do so.

Turner said the Corps has not reached out to ODEQ. He reiterated that the Corps' legal team believe that they understand the standard and how to apply it as it is written.

Stranz walked through the steps taken for the water quality issues with Washington last year:

- The Corps shared their perspective.
- FPAC wrote a letter directly to the water quality agency to clarification.

Trevor Conder, NOAA, asked whether the interpretation of 105% is novel as the 110% TDG standard has typically been used. He asked if there is a past record of using 105% TDG.

Norris said that they have made adjustments to operation in the past. When spill starts at Bonneville when they have been running close to chum and it is close to a 105% TDG tailwater after April 10 adjustment were made. They have also received requests to adjust an additional foot of tailwater in 2020.

Conder is concerned about the interpretations of shallow water being made. He said that even at a tailwater of 11.8 feet there would be redds in shallow water under two feet. The concept of when to interpret the standard at 105% TDG versus 110% TDG is not clear. The past history is to use the 110% TDG standard and now there is a shift. To use the 105%. He asked what it is based on.

Bettin said that it has happened since 2000. They had sent crews out to monitor levels and it was close to Warrendale's measurements. This year is exceptionally low and with the low tailwater, the corner collector produces more gas because it plunges further. This only happens on years with low tailwater and no depth compensation.

There have been times that it went over 105% TDG but they were able to bring the flows up and had depth compensation over the redds. The redds are in a fixed location so it is possible to calculate the TDG easier. Once the chum emerge, the standard is 110% TDG but when they cannot move (within the redd) it is 105% TDG.

Julie Ammann, Corps, added that the reduction was made earlier than is traditionally done in the past. With the 1.6-foot drop and low tailwater so early in March and not in April when most of the fish have typically emerged. It is different predicament than in the past and they are trying to be proactive in respect to state water quality standards.

Van Dyke said that this open mic with operators have not reached out the regulator to find interpretation. He believes that the group should stop the conversation for now and find clarity before the group becomes more agitated about removing another fish mitigation. He felt the topic is going long and would appreciate if the operators reach out to the regulators.

Stranz reminded of last years' process when they had a clear interpretation of the water quality standard they did not feel comfortable reaching out to the state agencies. It was instead more efficient and more effective for TMT FPAC members to reach out to the agencies to clarify.

Van Dyke said that the past process did not recognize that the regulator wrote in their rule that they needed to contact Oregon DEQ instead they continued to make interpretations.

Turner and Ammann on same page. Turner said that he will reach back out to legal and policy and see what they say about reaching out to Oregon DEQ. Turner will report back about what they tell him.

Ammann said that the Corps generally needs something in writing and it is not generally done through verbal communication. She mentioned that Hesse had asked if they need help, a way to help would be for FPAC to write.

Lorz asked Turner when they can get back to TMT. It sounds like it will be something that TMT will need to react quickly to keep from changing operations. This will affect what FPAC needs to do and whether FPAC will need to have meeting sooner than later. He asked Ammann whether an email or letter would work.

Ammann will double check. Have gotten clarification from email in the past but she is not sure what policy and legal will require.

Turner will also ask the policy team.

Baus said that the communication path to circle back to FPAC prior to TMT meeting. There is an update at FPOM tomorrow. He shares Lorz' concern that this is a time sensitive issue. First update could happen at FPOM tomorrow. If there is no solution at FPOM, there is a TMT meeting set for March 15. Hopefully a resolution is found during those meetings.

Morrill asked David Gruen, ODEQ, if there is a way to reach out.

Gruen said that he is standing by to work with the Corps and action agencies. He is happy to provide Oregon's interpretation of water quality standards. He can give more information in future meetings if needed. He is not prepared to provide a statement but he is willing to work toward a solution.

c. Fish – Trevor Conder, *NOAA Fisheries*

- Yearling Chinook
 - Started to collect data on March 3
 - 17-54 yearlings, so far
 - PIT tag history shows a release on February 6 from Klickitat history release. Conder contact the manager and they said that they release early to reduce density and push fish out early.
- Subyearling Chinook
 - Few more, over 100/day
 - One PIT tag for a Fall Chinook (hold over from last year)
- Coho
 - A few going through, not sure where they are from (no PIT tag data available)
 - A few projects are open early but there is no data to show.
- Adults
 - Bonneville
 - 2 chinook (1 detected around January 1, likely a fall)
 - Steelhead still low, >20 moving over
 - McNary

- Not operating yet
- Ice Harbor
 - 10 or less steelhead
- Lower Granite
 - A few more steelhead
 - March 1: 30 steelhead went through
 - RSW is opening for overshoot operation. PIT-tagged fish have been detected. Ten on first day, up to twenty so far.
 - Fish were originally tagged at Granite. There were a few fish from the lower river (one from Tucannon, one from Touchet, and one from John Day.
 - Operation is effective to move the overshoot steelhead back downstream through the project.
 - Each PIT tag fish represents more fish moving through, each tag can represent 100 untagged fish

Brian Marotz, MT, wanted to thank the BOR for coming to Hungry Horse dam to for a face to face and to set up annual meetings with FWP to coordinate the activities. It went well and he appreciates the effort.

Fenolio said he had a good time.

d. Power System – Tony Norris, *BPA*

- Still have below average temperatures and energy demand is still high for this time of year.
- There has not been much variable energy resource generation over the last couple of days but he expects this to change over next week.

5. Public Comments:

None

6. Set agenda for next meeting – March 15, 2023

- a. Chum Operations
- b. TDG issues (if needed)

Today's Attendees:

Agency	TMT Representative(s)
Army Corps of Engineers	Doug Baus (chair), Julie Ammann, Lisa Wright
Bonneville Power Administration	Tony Norris, Scott Bettin
Bureau of Reclamation	Joel Fenolio
NOAA Fisheries	Trevor Conder, Kelsey Swieca
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Jonathan Ebel
Montana	Brian Marotz
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	Tom Lorz
Colville Tribe	
Warm Springs Tribe	
Kootenai Tribe	
Spokane Tribe	

Other Attendees (non-TMT members):

Corps – Elizabeth Holdren, Daniel Turner, Scott St. John, Aaron Marshall, Chris Peery, Alexis Mills, Heather Baxter

NOAA – Chris Magel

DS Consulting – Emily Stranz (Facilitator), Colby Mills

BPA – Andrea Ausmus (note taker, Contractor with CorSource Technology Group)

Clearing Up – K.C. Mehaffey

Columbia River Bulletin – Mike O'Bryant

Oregon DEQ – David Gruen

PGE – Ruth Burris

Chelan PUD – Jay Fintz, Kate von Reis Baron

Avista Energy – Patrick Maher

Grant PUD – Peter Graf