COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 20, 2011

FACILITATOR'S SUMMARY NOTES
Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to 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.

Meeting Minutes
No comments were offered on the 3/30, 4/1 or 4/6 Official Minutes or Facilitator Notes. They are considered final unless suggested edits are shared and noted at a future TMT meeting.

SOR re: MOP +2 Operations at Lower Granite
Steve Barton, COE, reported that the action agency's official disposition on the request will be posted on the TMT web page very soon. Current conditions at Lower Granite were such that Lower Granite was operating at MOP +1 per the COE's planned operating procedures shared via email with TMT members and discussed at the last TMT meeting. Lower Granite flows were between 120 kcfs and 80 kcfs. An upward trend in the forecast that could bump flows up to 120 kcfs or above through the rest of April would mean the project would operate to MOP/flood control. Steve clarified the tools the COE uses to make the operating decisions. The RFC's near term forecast is used, and then, within a day of the operation, the real time gauges are used to verify actual conditions in the system. There is about a ½ foot overlap between all bands except for between MOP and MOP +1, so when flows are at that threshold level, the operation might fluctuate a bit within the same day.

With respect to dredging plans, Steve had nothing to report at this time, but said he is working on getting an update and will share any information with TMT as soon as it is available. TMT will continue to check in this issue at future TMT meetings.

SOR re: Lower Monumental Spill Patterns
A request put forth by the salmon managers and discussed at the 4/13 TMT meeting led to further inquiry but no change in operations – given that flows were at or below 100 kcfs, the requested switch to a uniform spill pattern at the project when flows are above 100 kcfs was not an issue until now. Steve Barton shared that because the COE is operating under court order for 'rollover' operations, the action agency needs a compelling reason to make a change. Until such time, the project would continue to operate using a bulk spill pattern consistent with the 2011 Fish Operations Plan. Steve added that flows increased to above 100 kcfs on 4/19 but were likely to drop below that level today and for the next few days, according to forecasts. Steve asked the salmon

managers if they had any additional biological information that would support the requested operation, in addition to what was described in the SOR.

Russ Kiefer, Idaho, reiterated the rationale that was included in the SOR for TDG management at the project in light of the two-turbine outage at Lower Granite dam and high flow conditions, and added that a study done by the PNNL showed a biological benefit to returning adults that are collected at Lower Granite and put through the bypass vs. those that are collected at Lower Monumental. This operation, he said, would provide more flexibility at the flow ranges being considered for uniform spill. He also said the 2008-09 study that resulted in the bulk pattern decision at Lower Monumental had not considered the unique TDG issues the system is facing this year. The salmon managers will be looking to re-evaluate the FPOM-recommended bulk spill pattern in the context of higher flows such as the current conditions, and additional data.

Steve Barton responded that the COE would be open to making an adjustment during involuntary spill such as was done last year – during very high flow conditions. He also noted that TDG is monitored at Ice Harbor and from there, degassing of about 5% is expected to occur. With the uniform spill pattern, there would be no change at Ice Harbor. The change would be a 10 kcfs spill increase at Lower Monumental. Dan Feil, COE, added that the 2008-09 study showed slightly better dam passage survival using a bulk spill pattern.

TMT members asked if the unit outages at Lower Granite were anticipated in the rollover plan, to which the COE pointed out language in the FOP that contemplates outages at Lower Granite in a general way.

TMT continued deliberations around the 2008-09 spill pattern study and current system configuration and water conditions, and the salmon managers clarified that the request intended the operation to be guided by flows in the system, not transportation start dates.

Next Steps: Steve Barton said the COE would work to resolve this issue no later than Friday, and suggested a follow-up conference call to allow the COE to provide a response and decision. **TMT scheduled a conference call for Friday, 4/22 at 11 am.**

Vernita Bar Update

Russell Langshaw, Grant County PUD, shared that operations were going well so far, and as expected. The reach had accumulated about 772 temperature units from the end of spawning, and emergence had occurred in all three zones indicating that more fish would be observed in the Hanford Reach very soon. Weekend minimums will begin this weekend and continue for four weekends through emergence. A 40 kcfs band width constraint is guiding operations; the mean flow was 154.8 kcfs. One exceedance occurred on 4/7 to support the egg-to-fry survival work that Russell had reported on at the 4/6 TMT meeting. The study was successful and results will be available soon. Russell will provide another update to TMT in two weeks.

Spring Creek Hatchery Release

Dave Wills, USFWS, reported that 6.4 million fish had been released on 4/12 and arrived at Bonneville that evening. The passage index yesterday was 26,000 so the soft constraint on turbine operations will end tomorrow (4/21). Overall, Dave said, mortalities were low and there was good coordination between the USFWS, BPA and the COE. The next release will occur on May 2. TMT will discuss this item at the 4/27 TMT meeting.

Chum Emergence
Paul Wagner, NOAA, said that according to the chum emergence model, emergence ended on 4/18, and therefore the 11.5' tailwater protection operation constraint could officially be lifted.

Dworshak Operations
Steve Barton and Steve Hall, COE, reported that the project met its 4/15 flood control elevation target and at that point, discharges were decreased to set the project up to meet an end of April elevation 1471.6' per refill curve intersect guidance. To get to a July 1 refill target, about 1 MAF would need to be released; current information showed this would mean a 6.7 kcfs daily average discharge.

FPAC discussed this issue and shared their preference to shape the flows using more water now to support 120 kcfs flows at Lower Granite.

After more discussion, the COE offered the following planned operation to meet the salmon managers' objectives (and said it also met the objectives of the deviation request submitted by Walla Walla District): Run the project at full powerhouse plus 2 kcfs spill (approximately 12 kcfs) until flows go above 120 kcfs at Lower Granite, at which point the project will back off.

Action/Next Steps: All TMT members present agreed to the operation described above. The COE will check in with the Nez Perce Tribe and, barring any objections, planned to begin the operation at 1:00 pm later today.

Operations Review
Reservoirs – John Roache, BOR, reported on projects: Hungry Horse was at elevation 3484.95' with 10.5 kcfs (2 kcfs spill). A unit that was out was planned to come back on line on 4/21 and Hungry Horse would no longer be spilling at that point. Grand Coulee was at elevation 1230.0', targeting 1220.2' at the end of April. Paul Wagner, NOAA, shared his hope to avoid a potentially similar scenario that occurred in 2008 when a severe drop was needed to reach the elevation – as such he requested the BOR use a 135 kcfs weekly average outflow target at Priest Rapids as a measure of continued operations at Grand Coulee. John responded that the BOR was open to this and that he needed to check in with the Colville Tribe re: any concerns for ferry transportation and cultural impacts. He added that the maximum drawdown at the project would be 1220.2' unless the COE offered further flood control guidance. This issue will be added to the 4/27 TMT agenda.

Steve Barton, COE, reported on projects: Libby was at elevation 2358.03' and operating

with 5.4 kcfs inflows and 8.5 kcfs outflows. Albeni Falls was passing inflows at elevation 2055.5'. Dworshak was operating with 9.6 kcfs inflows and 4.9 kcfs outflows, at elevation 1455.4'. As was discussed above, the project would go to full powerhouse plus 2 kcfs spill later today, barring any objections from parties not present at the meeting. Lower Granite daily average flows were 104.8 kcfs; 136.7 kcfs at Priest Rapids; 252.7 kcfs at McNary and 286.2 kcfs at Bonneville.

Fish – Cindy LeFleur, Washington, reported that the late adult migration is likely due to temperatures and high flows, comparable to what was seen in 2006. Paul Wagner, NOAA, reported on juveniles. Yearling Chinook counts at Lower Granite were 35,000 and the numbers were picking up. Steelhead counts were plotting higher than the historical average, with a 34,000 count at Lower Granite – some of this was due to the hatchery releases. Subyearling counts at Bonneville were 16,000. Sockeye counts at Lower Granite were 1,620 – most were thought to be kokanee. Lamprey counts were steady at John Day and few at Lower Granite and Bonneville.
Power – Nothing to report.

Water quality – Scott English, COE, said all water quality gauges were operating and no exceedances were reported. Spill at Lower Monumental was expected to increase later today.

Next Meeting, 4/27 Conference Call:
Agenda items include:

- Grand Coulee Operations
- Spring Creek Hatchery Release
- Transportation Operations Plan

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 20, 2011
Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Washington, USFWS, Oregon, BOR, BPA, Idaho, CRITFC/Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Questions or comments should be directed to the TMT chair.

2. Review March 30, April 1 and April 6 Meeting Minutes

There were no revisions today to the meeting minutes or facilitator's notes. Tony Norris, BPA, has a change to the minutes he will make via email.

3. Update on SOR 2011-1, Lower Granite MOP Plus 2

Currently Lower Granite discharges are between 80 and 120 kcfs, putting the project in the MOP plus 1 realm, Barton reported. The forecast suggests flow increases for the end of the month. There's a possibility of flows hitting 120 kcfs during that time which would put Lower Granite back into flood control operations, meaning a maximum elevation of 734 feet i.e. MOP. The COE will use the near term forecast from the RFC to plan the operation of Lower Granite in coming weeks along with looking at current inflow and day average inflow data.

In preparation for the date the operation shifts from MOP to MOP plus 1, the COE will position the reservoir for the next band and will confirm that it's time to transition, Barton said. Within a day of reaching thresholds, the operation will move to the next band. This will be happening in real time using predictive data and real time gauge readings.

Conversations are ongoing regarding actions the COE plans to take between now and the next fish passage season at Lower Granite. The COE will keep TMT informed of any new developments.

4. SOR 2011-2, Lower Monumental Spill Patterns

The Salmon Managers submitted this SOR on April 13 to request that Lower Monumental switch from a bulk to a uniform spill pattern when flows exceed 100 kcfs. Last Friday's conference call to discuss the COE's decision on SOR 2011-2 was canceled because the COE was still investigating the data surrounding this issue and flows were under 100 kcfs.

After reviewing the available information, the COE plans to continue the court-ordered rollover operation at Lower Monumental unless a compelling reason can be found to deviate from the bulk spill pattern identified in the spring 2011 Fish Operations Plan, Barton said. With Lower Monumental flows at 100 kcfs and expected to drop below 100 kcfs over the next few days, he sought a compelling reason to implement the SOR by asking the signatories to provide more information on its biological benefits.

With two turbines out at Lower Granite, uniform spill would improve the water quality of flows in the 100-160 kcfs range, which tend to generate high gas levels if spilled in a bulk pattern, Russ Kiefer, **Idaho**, said. Long-term SARs data indicate that adult return rates for fish collected at Lower Granite are higher than for those collected at Lower Monumental. If Lower Granite generates higher gas levels than anticipated, spill at Lower Monumental will have to be cut to meet water quality criteria – this is the Salmon Managers' main concern. It would mean spilling more fish at Lower Granite and putting more fish through the powerhouse at Lower Monumental. Kiefer offered to prepare a technical memo supporting the biological benefits of the SOR and acknowledged there will be debates on the meaning of the biological data when the study results are released. He explained how the rollover operation came about. The Salmon Managers initially favored bulk spill because it was associated with slightly higher rates of survival. However, that recommendation didn't incorporate the gas impacts associated with bulk spill, so the Salmon Managers are addressing it with this SOR.

Cindy LeFleur, **Washington**, asked whether the two-unit outage was part of the rollover operation from last year. If not, the unanticipated condition this year could provide a rationale for modifying the rollover. The court order recognizes that units go in and out of service for maintenance or other reasons, Barton replied. The plan was to spill 20 kcfs at Lower Granite in this case. The FOP does recognize that lack of load caused by a unit outage at Lower Granite could produce involuntary spill that exceeds the gas cap.

Last year, the COE switched Lower Granite to a uniform pattern to reduce gas during involuntary spill, Barton recalled. Gas levels in that reach of the river are typically dictated by Ice Harbor forebay levels, which at 115% tend to produce 118-119% TDG at Lower Monumental if a bulk spill pattern is used. The operational difference between bulk and uniform spill is approximately a 10 kcfs increase in spill at Lower Monumental, Dan Feil, COE, said. For both yearling Chinook and steelhead, the bulk pattern produced slightly higher levels of survival according to 2009 study results the COE reviewed. Using a bulk spill pattern wouldn't limit spill at Ice Harbor because forebay gas levels would remain the same. The results of a robust two-treatment study in 2009 indicated that spring migrant survival estimates should meet the performance standards for Lower Monumental.

The core issue isn't performance standards for juvenile survival but the whole life cycle, specifically adult return rates, Kiefer said. Tom Lorz, **CRITFC/Umatilla**, said passage numbers for steelhead in the 2009 study showed little difference in juvenile survival rates for the two spill treatments, while spring Chinook that were not transported had higher SARs. The Lower Monumental bypass could become a more confounding issue than bulk or uniform spill patterns. In general, it's better to spill fish at Lower Monumental – especially steelhead – or bypass them than transport them or send them through the powerhouse.

Kiefer pointed out that the higher juvenile survival rates associated with transportation arose before the surface passage system and spill program improved overall survival. When in-river steelhead survival from Lewiston to Bonneville was only 38%, transport was clearly of benefit, but by 2009, comparative steelhead survival had improved to 69%. Study results show that transportation no longer benefits wild spring Chinook or steelhead when in-river survival rates reach 53% or higher.

Barton asked whether the SOR envisions uniform spill only until transporation begins. No, uniform spill should be concurrent with transportation, Kiefer replied. Wagner estimated that transportation will begin on May 8 at Lower Monumental this year.

Rick Kruger, **Oregon**, thanked Idaho and CRITFC for their comments today and said Oregon supports the SOR. He noted that the Salmon Managers are unanimous in their support of this SOR. Paul Wagner, **NOAA**, acknowledged that it's hard to pin down a "magic number" at which the uniform spill pattern alleviates problems. Now that flows have dropped to a more manageable level, with gas levels at Lower Granite down from 123%, to 112%, the situation isn't as clear-cut. However, the SOR could provide a survival benefit.

Barton thanked the Salmon Managers for their detailed information today, which will aid the COE in determining whether existing conditions are unique enough to warrant a departure from the rollover operation. He emphasized that the COE will switch to a uniform spill pattern later in the season when involuntary spill occurs, as it has in prior years. TMT will reconvene in a conference call on April 22 to discuss the disposition of this SOR.

5. Vernita Bar Update

Russell Langshaw, Grant PUD, gave an update on the Hanford Reach protection flow program. Currently the operation is 772.4 ATUs from the end of spawning and 1,231.7 ATUs from initiation of hatching in the zone below 30 kcfs. Emergence is underway in all three zones. Weekend protection flows will begin this weekend and run for the next four weeks, with minimum flows based on mean daily minimums from the previous Monday through Thursday.

Mean discharges over the past week have been 154.8 kcfs, with a daily delta of just under 42 kcfs and a daily constraint of 60 kcfs. There was one exceedance on April 7 to support Grant PUD's egg-to-fry survival study. For a few hours, flows dropped to the mid-60s while 28 of the 32 egg tubes were successfully removed. Flows returned to minimums shortly thereafter. Wagner asked whether more fish are being seen now that emergence has peaked. So far, sampling crews have not found many fish, which could be due to a number of factors such as timing and flows. Langshaw will brief TMT again in two weeks.

6. Spring Creek Hatchery Releases

Dave Wills, USFWS, reported on the April 12 release of 6.4 million spring Chinook from Spring Creek Hatchery. That same day, the Little White Salmon Hatchery released 1.8 million tule fall Chinook. High flows carried the fish to Bonneville for an index count of 930,000 by that evening. By April 19, the passage index was down to 26,000, and a continued drop is expected. Overall, this year's operation has been successful, with low mortality rates and good coordination between BPA and the COE.

Cindy LeFleur, Washington, asked whether this is the first year Little White Salmon has released tule fall Chinook. There were three releases in March, April and May of 2008, Wills recalled. The March release was eliminated in 2009, but not the total number of fish needed to satisfy the U.S.-Canada treaty, so part of that production went to the Little White Salmon Hatchery.

The next Spring Creek Hatchery release is scheduled for May 2. TMT will coordinate that operation at its next regular meeting, a April 27 conference call.

7. Chum Emergence

Paul Wagner, NOAA, reported that emergence ended on April 18 according to the Battelle model, which indicates that 10% of the redds this year are in the Ives Island area.

8. Dworshak Update

The project met its April 15 flood control target of 1,451.4 feet per the deviation request made by the COE Walla Walla district, Barton reported. Discharges have ramped down since then, targeting 1,471.6 feet elevation by the end of April. Steve Hall, COE Walla Walla, reported that the project drafted heavily to meet its April 15 target and has transitioned to a refill curve. The April 30 flood control target is based on normal inflows and might need to be modified slightly based on observed inflows, which are now 115% of normal.

Speaking for FPAC, Paul Wagner said the best use of the reservoir now is to draft to a lower elevation while gas levels are still controllable, creating space to help manage gas impacts once involuntary spill begins. Using Dworshak reservoir to support a 120 kcfs flow target at Lower Granite is a good plan. Flows of 120 kcfs with two units out of service at Lower Granite would produce spill of about 45 kcfs, which is manageable from a TDG standpoint.

There's approximately 2 maf of storage volume now in Dworshak reservoir, which normally fills by the end of June, Hall said. July is expected to bring another 400-700 kaf in runoff depending on inflows and spring temperatures – roughly 1 maf in addition to the 2 maf of available space. That 1 maf will need to be discharged over the next 60-75 days, which is equivalent to about 6.7 kcfs in daily discharges throughout the refill period. It's not a given that the project will operate above powerhouse for the entire season.

The Walla Walla district has been coordinating with Dworshak hatchery, which would prefer to minimize gas effects from this point forward. Therefore an operational objective is to limit Dworshak discharges to 12 kcfs, the level at which the hatchery can strip gas down to 100%. Beyond that concern, Hall said, the COE is well positioned to provide volume for spring flow augmentation. This kind of flexibility was one objective of the deviation request the district made.

Beginning at 1 pm today, the COE will operate Dworshak with 12 kcfs flows, or full powerhouse plus 2 kcfs spill, until Lower Granite flows exceed 120 kcfs, assuming there are no objections from the Nez Perce Tribe. Barton will consult with them after today's meeting. The Corps will be mindful of monitoring the volume to refill the project, as well.

9. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3,484.95 feet, with 10.5 kcfs discharges including 2 kcfs spill. Beginning tomorrow, spill will stop and total discharge will increase be 10 kcfs through the power plant when the fourth unit comes back on line. The end of April flood control elevation is 3,479.5 feet. Snow pack is 154% of normal in the Flathead basin.

Grand Coulee is at elevation 1,230.0 feet, targeting 1,220.2 feet by the end of April. Overdrafting in 2008 during plentiful flow conditions caused problems for the Hanford operation and serious concerns about flows in the upper and lower Columbia, Wagner recalled. In an attempt to avoid that scenario this year, FPAC recommends maintaining discharges of 135 kcfs at Priest Rapids as a weekly target. John Roache, BOR, said he will relay this request to the Colville Tribe, whose ferry requires a minimum elevation of 1,228 feet.

Libby is at elevation, 2,358.03 feet, awaiting refill. Inflows are 5.4 kcfs and daily average discharges are 8.5 kcfs. Albeni Falls is at elevation 2,055.5 feet,

with inflows of 35.9 kcfs and discharges of 38.2 kcfs. Dworshak is at elevation 1,455.4 feet, with inflows of 9.6 kcfs and daily average discharges of 4.9 kcfs.

Lower Granite is releasing outflows of 104.8 kcfs, with a prior week average of 195 kcfs. Priest Rapids is releasing 136.7 kcfs, with a prior week average of 154.9 kcfs. McNary is releasing 252.7 kcfs, with a prior week average of 262.8 kcfs. Bonneville's discharge was 286.2 kcfs yesterday. The prior week average was 281.7 kcfs.

b. Fish. Adults: There are several indications that the adult migration is delayed this year in response to cooler conditions than normal, Cindy Lefleur, Washington, reported. The most recent year with similar conditions was 2006, when migration didn't pick up until the beginning of May.

Juveniles: Yearling Chinook passage at Lower Granite is above average in comparison to the 10-year cumulative passage index, Wagner said. Migration of wild fish has been steadily increasing since April 6.

c. Power. There was nothing to report today.

d. Water Quality. Scott English, COE, reported that all gauges are operating and there are no exceedances.

7. Next Meeting

There will be a conference call on Friday, April 22 to discuss the final disposition of SOR 2011-02 regarding uniform spill at Lower Monumental. Next week's regular TMT meeting will be a conference call on April 27.

Name	***Affiliation***
Paul Wagner	NOAA
Cindy Lefleur	Washington
Dave Wills	USFWS
Rick Kruger	Oregon
Steve Barton	COE
John Roache	BOR
Tony Norris	BPA
Russ Kiefer	Idaho
Scott English	COE
Scott Bettin	BPA
Steve Hall	COE Walla Walla
Dan Feil	COE
Laura Hamilton	COE
Karl Kanbergs	COE
Tom Lorz	CRITFC

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Dave Benner	FPC
Russ George	WMC
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Margaret Filardo	FPC
Barry Espenson	CBB
Ruth Burris	PGE
Ron Frank	Colorado Energy
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Tom Le	Puget Sound Energy
Doug Vine	Thompson Reutters
Shane Scott	PPC
Russell Langshaw	Grant PUD