

## MEMORANDUM FOR THE RECORD

Subject: Final minutes for the 04 February 2020 Willamette Fish Facility Design Work Group meeting.

The meeting was held in the Fireside Room at the Block 300 Building in Portland, OR (NWP). In attendance:

Last name	First Name	Agency	Email
Ament	Jeff	NWP-PM-F	<a href="mailto:Jeffrey.M.Ament@usace.army.mil">Jeffrey.M.Ament@usace.army.mil</a>
Budai	Chris	NWP	<a href="mailto:Christine.M.Budai@usace.army.mil">Christine.M.Budai@usace.army.mil</a>
Fielding	Scott	NWP	<a href="mailto:Scott.D.Fielding@usace.army.mil">Scott.D.Fielding@usace.army.mil</a>
Garletts	Doug	NWP -ODV	<a href="mailto:Douglas.F.Garletts@usace.army.mil">Douglas.F.Garletts@usace/army.mil</a>
Helms	Chad	NWP-ODV	<a href="mailto:Chad.K.Helms@usace.army.mil">Chad.K.Helms@usace.army.mil</a>
Hill	Suzanne	NWP-PME	<a href="mailto:Suzanne.Hill@usace.army.mil">Suzanne.Hill@usace.army.mil</a>
Hudson	Mike	USFWS	<a href="mailto:michael_hudson@fws.gov">michael_hudson@fws.gov</a>
Janes	Kelly	NWP-PM-E	<a href="mailto:Kelly.A.Janes@usace.army.mil">Kelly.A.Janes@usace.army.mil</a>
Jundt	Melissa	NMFS	<a href="mailto:melissa.jundt@noaa.gov">melissa.jundt@noaa.gov</a>
Kelley	Elise	ODFW	<a href="mailto:elise.x.kelley@state.or.us">elise.x.kelley@state.or.us</a>
Khan	Fenton	NWP-PM-E	<a href="mailto:Fenton.o.khan@usace.army.mil">Fenton.o.khan@usace.army.mil</a>
Kovalchuk	Erin	NWP-ODT-F	<a href="mailto:Erin.H.Kovalchuk@usace.army.mil">Erin.H.Kovalchuk@usace.army.mil</a>
Litzenberg	Aaron	NWP-ENC	<a href="mailto:Aaron.D.Litzenberg@usace.army.mil">Aaron.D.Litzenberg@usace.army.mil</a>
Loffink	Ken	ODFW	<a href="mailto:Ken.j.loffink@state.or.us">Ken.j.loffink@state.or.us</a>
Mullan	Anne	NMFS	<a href="mailto:Anne.Mullan@noaa.gov">Anne.Mullan@noaa.gov</a>
Murauskas	Josh	Four Peaks Consulting	<a href="mailto:jmurauskas@fourpeaksenv.com">jmurauskas@fourpeaksenv.com</a>
Pierce	Todd	NWP-ODV	<a href="mailto:Todd.M.Pierce@usace.army.mil">Todd.M.Pierce@usace.army.mil</a>
Reis	Kelly	ODFW	<a href="mailto:Kelly.E.Reis@state.or.us">Kelly.E.Reis@state.or.us</a>
Schlenker	Steve	NWP	<a href="mailto:Stephen.J.Schlenker@usace.army.mil">Stephen.J.Schlenker@usace.army.mil</a>
Scott	Shane	NWPA	<a href="mailto:shane@sscottandassociates.com">shane@sscottandassociates.com</a>
Spear	Dan	BPA	<a href="mailto:DJSpear@bpa.gov">DJSpear@bpa.gov</a>
Steere	Molly	Four Peaks Consulting	<a href="mailto:msteere@fourpeaksenv.com">msteere@fourpeaksenv.com</a>
Tarbox	Erica	NWP	<a href="mailto:Erica.M.Tarbox@usace.army.mil">Erica.M.Tarbox@usace.army.mil</a>
Woolbright	Ryan	NWP-ENC-HD	<a href="mailto:Ryan.C.Woolbright@usace.army.mil">Ryan.C.Woolbright@usace.army.mil</a>
Ziller	Jeff	ODFW	<a href="mailto:Jeffrey.S.Ziller@state.or.us">Jeffrey.S.Ziller@state.or.us</a>

On the phone: Garletts, Helms, Hudson, Jundt, Kelley, Loffink, Mullan, Murauskas, Pierce, Reis, Scott, Spear, Steere, Tarbox and Ziller.

**Meeting Purpose:**

Finalize previous meeting notes. Provide an update on status of active design projects and presentations from the Foster DSP (Fish Weir) and High Head Bypass PDTs.

1. Final Decisions or recommendations made at this meeting.
  - 1.1. January meeting minutes were approved.

2. Schedule of Reviews

<b>Document</b>	<b>Review Dates</b>
Foster Ladder 60%DDR Report	August
Foster DSP with modeling results	Spring
Cougar DSP 2.0 60% report	Comments due 02/07/2020
Cougar DSP 90% Plans and Specs	May
Detroit 60% first section	summer
High Head Bypass 60% report	February

3. Updates on active design/construction projects

- 3.1. Jeff Hicks is now the PM for Detroit, Fall Creek and Cougar 2.0.
- 3.2. Suzzy Hill is now the PM for the High Head Bypass project.
- 3.3. Fall Creek AFF – no update this month
- 3.4. Cougar DSP 2.0 – The 60% is out for review. Comments are due on 07 February. Jundt commented that she would like Section 35 on dam safety criteria concerning the diversion tunnel and extreme drawdowns to be described better. Fielding said that the dam safety information will be in more detail in the next report in order to help rank the alternatives. Mullan expanded that repeat deep drawdowns in every season in order to use the diversion tunnel is main concern. If the diversion tunnel is used, NMFS needs to know the bathymetry of the saddle in order to see if this would be a problem for fish. Jundt would like to see the investigation increased so that they don't eliminate the alternative accidentally. Woolbright said that if the diversion tunnel alternative is going forward, then it understood that additional studies are required and the risk needs to be evaluated. The study that is needed is above the scope of this current project. For the matrix, NMFS had a different thought process. Jundt would like to see the report background information on why non-power alternatives are now being looked at. Documenting the changes in approach and why it is different than the other Cougar reports may be helpful in the future.
- 3.5. Cougar DSP – The team is working on the 90% package to be completed by 7 April. The report will then go through the District review. The agency review will be in mid-May. Janes is in contact with NMFS on the EA and is expecting a draft of their consultations by the end of February.
- 3.6. Detroit Temp Control and DSP –The PDT is continuing to work on the design for the tower and addressing questions for the EIS.
- 3.7. Foster AFF ladder Improvements – The PDT is working on the 30%DDR for April and the 60%DDR for July. The regional review of the 60% should be around August.
- 3.8. Foster DSP - Fish Weir Design Improvements – [Presentation] Litzenberg showed a video using the new software of the redesigned fish weir with the plunge pool. There are two major problems from the old weir that the team is trying to address. The first is the impact of the weir jet hitting the spillway surface and the second is not enough water depth to support fish reorienting themselves as they go down the spillway. Using the new software, probe particles are released into the flow to look at the first question of impact with the spillway surface. The probe particles can be tracked for location, velocity and abrupt changes in velocity. For the second question, they need to look at how high the plunge pool weirs need to be so water and fish don't go over the sides. They will also look at the retention time in the plunge pool. The overall results showed that the new weir would be better for juveniles but still need to run the model for kelts. Each run

has nine particles that can be any size or weight. The particles are independent of each other. The modeling looks at changes in velocity not acceleration. The CFD model was within 8% of the acceleration of the sensor fish used in the real life testing. Each model run takes about 5 days to run. The team ended up increasing the Ober-Meyer style weir height by 1ft. from the original design to create a larger plunge pool. For retention time model runs, all particles moved through in less than one minute. Chute hydraulics showed that under flooding conditions they will need to remove the channel chute for dam safety reasons. The PNNL study showed a high rate of injury going down the face of the spillway. The PDT is trying to balance this concern with dam safety criteria. The team modeled putting the flow through the other three spillway weirs but it caused erosion conditions on the spill way basin. The spillway is designed to operate using all four weirs under high flow. Loffink asked about modeling another configuration of the plunge pool design. Litzenberg said that a 30' plunge pool would be most effective but it is not feasible in this situation. The plunge pool theory is to get a cushion for the water jet and move the energy downstream. If the modeling results show an improvement, they will probably keep the weir in the current location. If they don't see the improvement they want, they can change the location to a different spill gate. **ACTION: Khan will send the presentation out with the minutes.** Ziller asked if there were any alternatives that did not consider the spillway. Khan said that back in the EDR stage, the PDT looked at pipes going around the dam and pipes through the dam. The deciding factor was fish safety and water concerns not cost. The PDT is working on another special spill operation request similar to last year. This request is working through WFPOM. The next report will be sent out when the modeling results are complete.

- 3.9. High Head Bypass – [Presentation] Hill is the new PM. Woolbright gave an overview of the 60% report for the upcoming review. The team narrowed down the six alternatives to four. Within these four, the team ranked the alternatives and choose two to move forward. The helical pipe alternative had high velocity problems in the outside of the bend and circulation issues within the pipe. The fish lock alternative would have a standalone concrete structure that dissipates the energy within the structure. One concern is the outlet pipe would have an angle of 26° which is hard to drill out but is needed to stop fish from holding. The multiple outlet/penetration alternative is similar to Green Peter but with slower velocities. The last alternative is the dual fish lock that goes up and over the dam. This alternative would require very large pumps and a snaking pipe to dissipate energy. The choices were put into the matrix. Alternatives #2 (fish lock) and #5 (multiple outlet) ranked the highest and will move forward. The team is still looking at the ODFW alternative in-house since it was not part of the AE contract. The biggest impact of the ODFW alternative is the drawdown and the ability to hit the target flows throughout the year. Khan said that the helix looked good until they saw how much pressure needed to be released. At Cle Elum, the helix doesn't need pressure relief because it is an open channel flow. Ziller thinks that if there was a single hole with an open channel, it could work. Woolbright said that the Cle Elum pipe is significantly larger with much more water. In addition, the helix has to be tighter due to the amount of space behind the FSS.

#### 4. Next Steps

- 4.1. Next WFFDWG meeting currently scheduled for March 3
- 4.2. Willamette Science Review is next week