OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE- 14TDA09 adult attraction spill test
COORDINATION DATE- 5 August 2014. **Updated on 4 September and 17 September.**
PROJECT- The Dalles Dam
RESPONSE DATE- 14 August 2014 (FPOM). **Any additional comments are requested ASAP.**

Description of the problem- Uneven flow distribution at The Dalles Dam, like at Bonneville, can lead to overcrowding in one of the project fish ladders (usually TDA-E). The situation at TDA is unique, however, since TDA-N normally passes a low percentage of the project passage, either due to highly turbulent entrance conditions under normal 40% juvenile spill levels or due to lack of attraction flow during no spill conditions (see Tables 1 and 2). While crowding is less likely at TDA than at BON due to significant tributary turnoff and harvest in the Bonneville Pool (the number of Chinook passing TDA was about 30% lower than at BON in 2013). There is still the potential for overcrowding in TDA-E, particularly when there is a strong run of upriver bright fall Chinook, as seen in the late summer of 2013 and expected again in 2014.

Table 1. Spill season (April-August) TDA-N passage percentage for 2010 – 2013.

	2010	2011	2012	2013	Average
Adult Chinook	31	17	21	28	24.3
Jack Chinook	18	6	7	15	11.5
Steelhead	27	10	12	16	16.3
Sockeye	24	3	2	21	12.5
Average	25	9	10.5	20	16.1

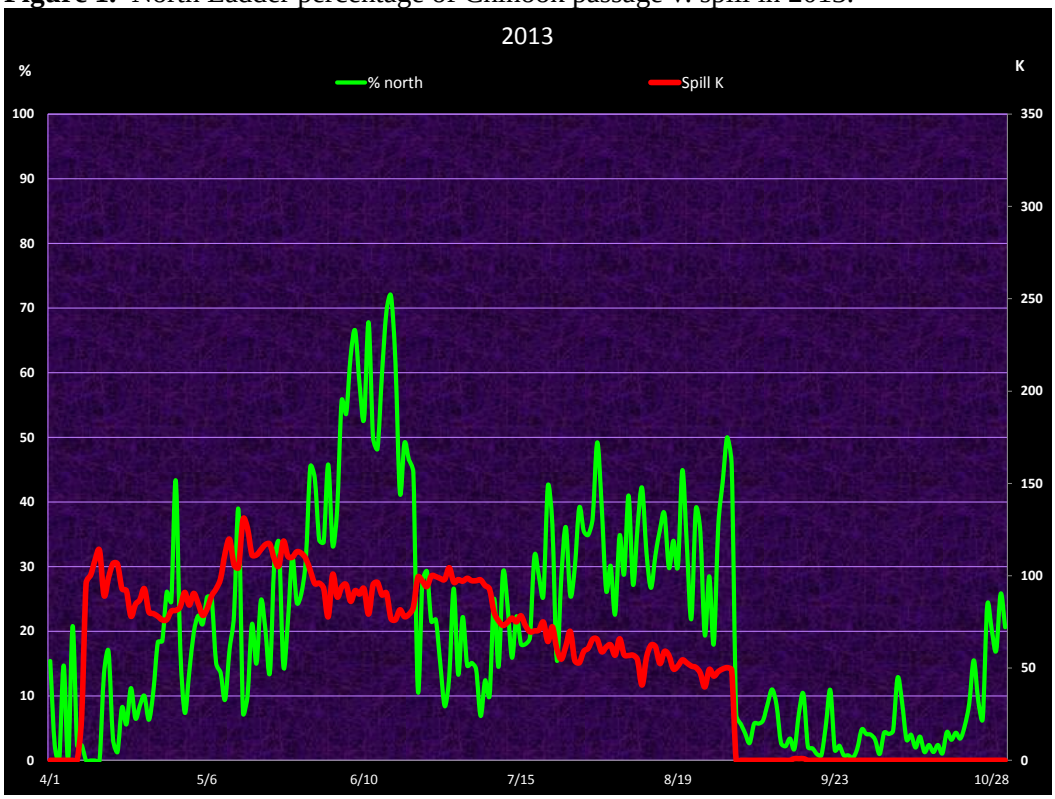
Table 2. Percentage of adult Chinook passage via TDA-N, 1 Sept – 31 Oct.

	2010	2011	2012	2013	Average
% N. Ladder	6	5	7	6	6

During the normal spill season, when 40% of the river flow is spilled, adult Chinook passage via the north ladder can be substantially higher than it is without spill. Figures 1 and 2 show the percentage of Chinook using TDA-N v. spill. These data indicate that Chinook will pass TDA-N in significant percentages under certain river discharges while spilling 40% of the flow..

NWP is anticipating another large fall Chinook run in 2014 and recommends conducting a test to see if 15 kcfs spill could help increase the percentage of fish passing through TDA-N by 20 - 30% over the non -spill condition.. The quantity of spill to be tested was determined by using the TDA model at ERDC in Vicksburg, Mississippi .

Figure 1. North Ladder percentage of Chinook passage v. spill in 2013.



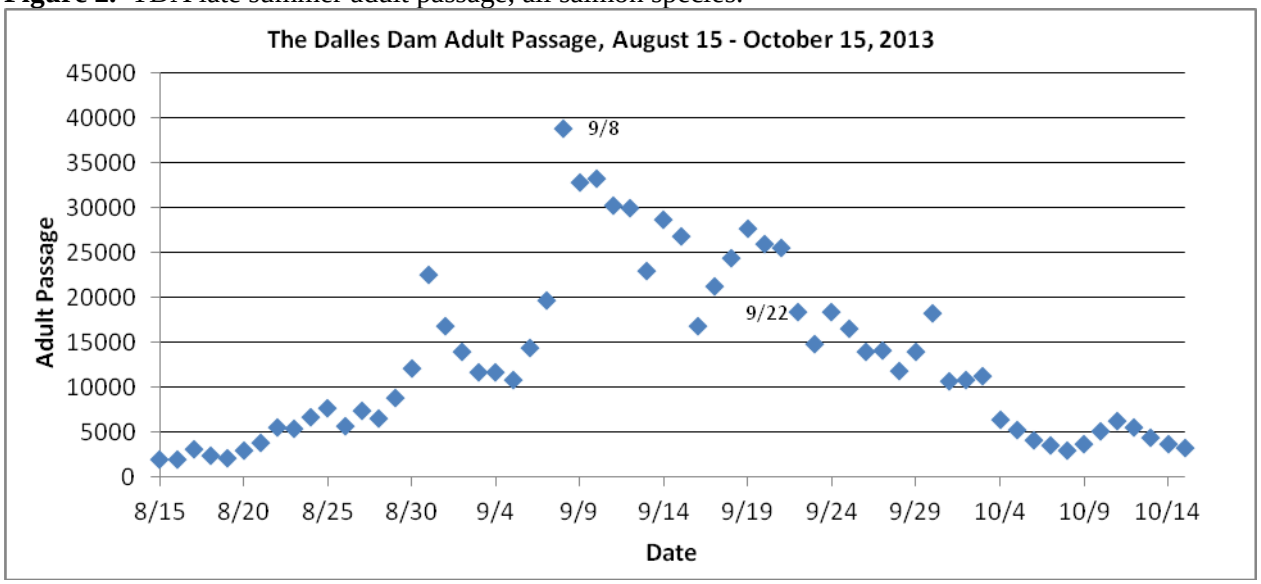
Type of outage required- The exact amount of spill is 15 kcfs with the breakdown being 6.5 kcfs from bay 1,and 4.5 kcfs from bays 7 and 8.

Impact on facility operation- The Project would be spilling after 31 August but there should not be significant impact on normal operations.

Dates and duration of impacts- The test will begin no sooner than 7 September and no later than 12 September, with a target of 10 September. Daily spill will occur between 0400 and 1600 each day for a total of seven days.

Figure 2 illustrates the passage pattern of all adult (plus jack) salmon at TDA from mid-August to mid-October of 2013

Figure 2. TDA late summer adult passage, all salmon species.



Expected impacts on fish passage- There are likely to be few, if any, negative impacts to upstream migrating salmonids or lamprey with this operation. The best case is fish more equally distribute themselves between the two ladders. The worse case is nothing happens and fish continue to pass through TDA-E. It is expected that increasing attraction flow via spill at TDA-N will increase the percentage of fish using TDA-N v. TDA-E.

Downstream Migrants. Adults passing downstream through the spillway will likely be impacted similarly as those passing through the ITS. Juvenile salmonids are not sampled at TDA but looking at the JDA dam, the next dam upstream, numbers are low with smolt monitoring ending by mid-September. It is believed that juveniles passing through the spillway during this test will likely fare better, and at least no worse, than those passing through the turbines.

Figure 3. FPC Smolt Data: JDA passage numbers for sub-yearling Chinook mid –August through December 2013.

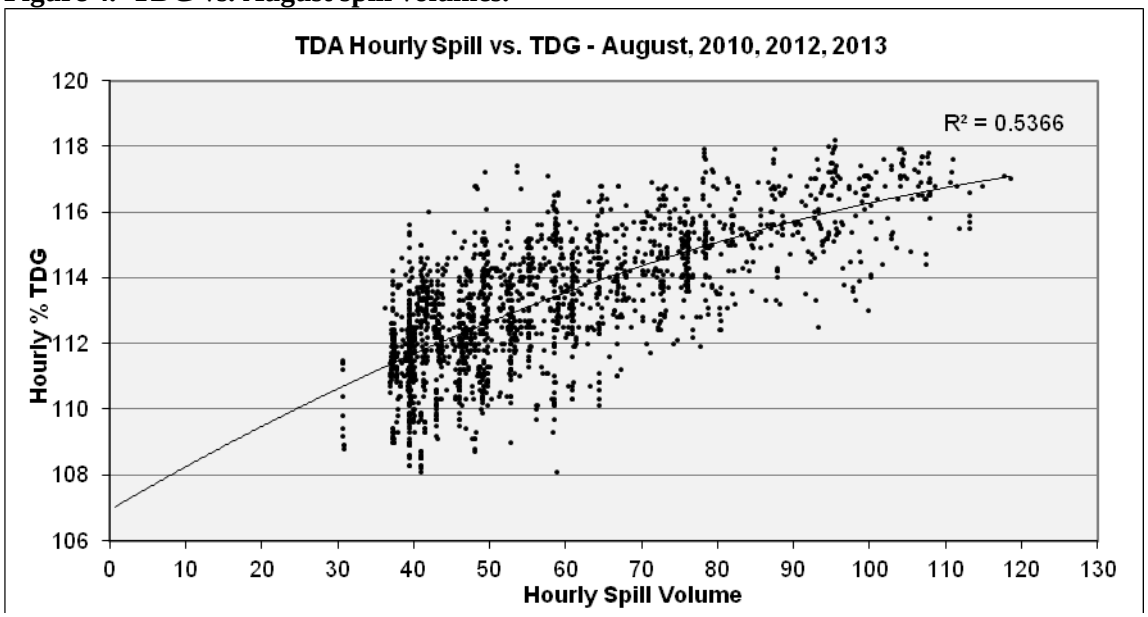
Site	SampleDate	Species	Riverflow	CollCount	Sampcount	Passindex	NumExaml	NumDesc
JDA	8/16/2013	CH0	163.22	273	52	390	52	1
JDA	8/20/2013	CH0	145.19	665	90	953	90	1
JDA	8/23/2013	CH0	134.8	141	33	202	33	2
JDA	8/27/2013	CH0	121.7	32	8	46	8	0
JDA	8/30/2013	CH0	131.45	8	2	11	2	0
JDA	9/3/2013	CH0	90.62	44	11	45	11	0
JDA	9/6/2013	CH0	89.4	12	3	12	3	0
JDA	9/10/2013	CH0	116.59	8	2	8	2	0
JDA	9/13/2013	CH0	117.89	12	3	12	3	0

Smolt Data at John Day Dam from: 08/16/2013 to 12/15/2013 for species: Combined Chinook Subyearling

Dissolved Gas- TDG will need to be monitored during this operation. TDG generated by this spill will need to be at or below 110% at the TDA downstream gauge. The data in Figure 4 summarize the TDG levels at this gauge generated by the spill levels that occurred in August since the spillwall was installed. The year 2011 was omitted because spill and TDG levels were well above what we are considering. The data suggest that the 110% TDG level likely occurs at

about 25 to 30 kcfs spill. Spreading the spill out a bit from the normal pattern might help reduce TDG levels further.

Figure 4. TDG vs. August spill volumes.



Comments from agencies

BPA - -----Original Message-----
From: Lut,Agnes (BPA) - KEWR-4 [mailto:axlut@bpa.gov]
Sent: Wednesday, August 06, 2014 11:54 AM
To: Mackey, Tammy M NWP; Klatte, Bernard A NWP
Cc: BPA Scott Bettin
Subject: [EXTERNAL] RE: FPOM: Official Coordination - 14TDA09 Spill test

Tammy, Bern

Regarding the spill test at TDA MOC, the link "2013 TDA spill test review - NOAA <http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20TDA%20split%20flows/TDA%20split%20flow%202013%2011-7%20TDA%20Fall%20Spill%20Test%20Review.docx> " does not work. Can you forward the referenced doc to us directly? Thank you.

In reviewing the MOC, the triggers and goals of the operation are not explicitly stated. The MOC references the BON trigger. However, BPA does not support the application of the BON trigger to TDA considering the design differences between the facilities. BPA is concerned that without clearly identifying and having agreement on the goal and trigger of this operation, the region will be debating the success of the operation and when to start a future operation. We believe more work needs to go into identifying and clearly stating the goal and trigger. BPA will be involved in the upcoming ERDC model evaluation trip which will help answer the question of what is possible. Based on the

outcome of the ERDC trip and follow up conversations, the MOC will likely be updated.

Has ACOE been able to get any additional information on the design capacity of the ladders at TDA?
Thanks and I appreciate your work on this.
Agnes-

3 September 2014 1000 Conference Call – Attendees included: Bettin, Conder, Fredricks, Klatte, Mackey, Van dyke, Rerecich.

Rerecich recapped the ERDC trip. He said they looked at many model runs and came up with the following:
Bay 1 – 4' opening (6kcfs)
Bays 7 and 8 – 3' opening (4.5kcfs)
Total 15kcfs

Need BON forebay at 75' – 76.5' msl. The elevation is critical to maintaining better egress conditions. Lower TDA tailwater dissipates the flows over the shelf. Bettin added that using the spillwall helped concentrate the flow into the thalweg.

Duration would be 12 hour operation (0400 – 1600) for 7 days. Fredricks recommends starting any day since BON has reached the split flow trigger.

Van dyke asked if the reason we would not be spilling more or for longer is because BPA wouldn't agree to it. Fredricks said he looked at the data from University of Idaho and found that fish seem to approach in the early morning hours and the recent fish unit outages and the fish finding TDA-N quickly, he didn't have as much of a concern about doing only a 12 hour operation. Van dyke had some skepticism about doing a test for anything less than 24 hours. He said there are enough little variables out there that could twist results if the test is anything less than 24 hours. Fredricks said this should be a rigorous test and could lead to a more permanent operation if triggers could be agreed to at a later date.

Fredricks acknowledged that a 24 hour test would be preferred but he believes the proposed test is something that could occur this year. It may be that we are testing again in 2015, but for 2014 the 12 hour test is a start.

Bettin asked what success looks like. Fredricks said he would like to see a 75% - 25% split between TDA-E and TDA-N but any movement to TDA-N would be a benefit to reducing crowding in TDA-E. Fredricks said he thinks the results from the fish unit outage shows promise that fish will move to TDA-N if there is a blockage and if we can provide flow, we should be able to get fish to move. That is the point of this test, to see if the 15kcfs and pattern will be enough to encourage fish to find TDA-N.

Fredricks recommends starting as soon as BPA can arrange it. Bettin said four days are needed so it looks like it could start next week. He said the filling needs to occur over time and not all in one day.

Bettin added that this test is just a start. There will need to be more discussions about what problem is going to be solved and what a trigger might look like.

Bettin said we need to make sure the Tribes are ok with the filling occurring during tribal fishing. The concern tends to be over the rate of change as opposed to the forebay elevation.

Those on the phone were in general agreement with the proposed test, time, and duration. Everyone thanked each other for all the efforts made to make this test a reality.

11 September 2014 FPOM - TDA adult attraction spill test. As per 14TDA09, the spill test has gone begun. Early results show some success in moving fish. Van Dyke asked that the actual numbers be included in the analysis that Rerecich sent out. Fredricks gave a brief background on the situation. He said historically we see about 6% of the run using TDA-N; with the spill we are seeing closer to 18%. Fredricks said there is another pattern we can test. He provided a video from the model for FPOM to look at. Bettin suggested reducing the flow through bay 1 to help reduce the energy right by the fishway entrance. Cordie said the bay can be reduced down to two feet. Fredricks suggested moving the flow to bay 8. Fredricks showed video of the model runs. FPOM discussed the different operations. Fredricks would like to see consideration of changing the operation to try to get a higher percentage of the fish using TDA-N. He said if the percentage stays stable over the next couple days then try the two bay pattern (Option 2 below). If the percentage of fish using TDA-N is highly variable, then keep the current operation. Lorz said he can agree with changing the pattern as long as FPOM can agree that the test has successfully moved fish from TDA-E to TDA-N. Bettin agreed but asked how the tool could be used in the future. FPOM concurred with moving spill to bays 1 and 2 (Option 2) at 0400 on 13 September. There will be a conference call at 0900 on 12 September to verify the percentage hasn't changed.

- **1.1.** Current Operation. Bay 1 – 4', Bay 7 – 3', Bay 8 – 3'. Equals 15K.
- **1.2.** Option 1. Bay 1 – 3', Bay 7 – 3', Bay 8 – 4'. Equals 15K.
- **1.3.** Option 2. Bay 1 – 5', Bay 2 – 5'. Equals 15K.
- **1.4.** *Update- conference call held at 0900 on 12 September. Bettin, Fredricks, Klatte, Lorz, Mackey and Wright called in. The fish counts did not appear to stay stable so the group decided not to go with the two bay operation. They talked of reducing bay 1 by 1' and moving it to bay 8. The group was agreeable to that but wanted to hear from Ebner before committing to the change. Mackey sent Ebner an email asking her opinion and followed up with a phone call. If Ebner was not able to get back to Mackey by COB on 12 September, the pattern would remain and no change would be made.*

Final results- 15KCFS total will be spilled from bays 1, 7, and 8. Spill will occur for 12 hours per day for seven days. Hours will be 0400 – 1600. Spill will begin on 9 September and end at 1600 on 16 September.

On 12 September, Ebner replied back to Mackey. The spill pattern was adjusted for the remainder of the test to Bay 1 – 3', Bay 7 – 3', and Bay 8 – 4'.

Please email or call with questions or concerns.
Thank you,
Bob Cordie - TDA Project Fisheries Biologist – Supervisor

Tammy Mackey - NWP Operations Division Fishery Section

Jon Rerecich - NWP PM-E Planning Biologist

TDA Passage % by Ladder, East and North

Adult Fish Counts - http://www.nwp.usace.army.mil/Missions/Environment/Fish/Data.aspx

	All Chinook, Steelhead, Coho		All Chinook		All Steelhead		All Coho	
	East	North	East	North	East	North	East	North
9/6	96.7%	3.3%	97.5%	2.5%	96.9%	3.1%	90.2%	9.8%
9/7	95.2%	4.8%	97.1%	2.9%	93.3%	6.7%	84.9%	15.1%
9/8	93.1%	6.9%	93.9%	6.1%	92.7%	7.3%	84.2%	15.8%
	(9/9 - 15K Spill begins 0400-1600, Bay 1: 6K, Bay 7: 4.5K, Bay 8: 4.5K)							
9/9	80.2%	19.8%	81.9%	18.1%	76.0%	24.0%	69.3%	30.7%
9/10	82.7%	17.3%	82.8%	17.2%	85.8%	15.2%	79.6%	20.4%
9/11	82.8%	17.2%	88.5%	11.5%	73.8%	26.2%	67.5%	32.5%
9/12	85.1%	14.9%	89.1%	10.9%	82.7%	17.3%	76.0%	24.0%
	(FPOM coordinated Spill pattern adjustment 9/13 - 15K Spill 0400-1600, Bay 1: 4.5K, Bay 7: 4.5K, Bay 8: 6.0K)							
9/13	87.9%	12.1%	94.9%	5.1%	82.9%	17.1%	76.6%	23.4%
9/14	88.3%	11.7%	91.6%	8.4%	80.8%	19.2%	85.9%	14.1%
9/15	88.3%	11.7%	92.5%	7.5%	82.8%	17.2%	80.6%	19.4%
9/16	94.8%	5.2%	96.2%	3.8%	95.3%	4.7%	91.1%	8.9%