

**OFFICIAL COORDINATION REQUEST FOR  
NON-ROUTINE OPERATIONS AND MAINTENANCE**

**COORDINATION TITLE-** 17TDA20 AWS October Start Revised

**COORDINATION DATE-** 8/11/2017

**PROJECT-** The Dalles Dam

**RESPONSE DATE-** 8/25/2017

**NOVEMBER 8 UPDATE:** At the November FPOM meeting, FPOM concurred with the area #1 daytime dive extension, hours 1200-1800 from Nov. 12-20. The work includes hydro-blasting and forming the seal plate but no grouting or pouring of concrete.

**OCTOBER 24 UPDATE:** Vibration monitoring and data collection at TDA-E continues. Results and methods are posted on the FPOM website at

<http://pweb.crohms.org/tmt/documents/FPOM/2010/FFDRWG/TDA%20back-up%20AWS/>

Results indicate very short (seconds) spill trigger exceedances during construction and non-construction periods. As a result, daytime spill for north ladder attraction occurred on Oct. 19, 21, and 22. The adult count data at TDA-E and TDA-N suggest that the trend in counts during construction is within natural variability with no evidence of delay during spill and non-spill periods.

Construction engineers have reported that rock removal is much less than originally anticipated. The location of the remaining rock is identified in the picture below with an arrow. The contractor has approximately 7 cu yds to remove (20' long x 8' wide x 2' deep) and is not optimistic about success with the ripper. The expected duration to remove all rock with an excavator and breaker is four hours. This will result in a shorter duration for this portion of the work. The remaining work in October, following rock removal, is expected to result in less vibration.



**A project update call occurred on Oct. 23rd with BPA, NOAA, NWD, and NWP. The decision was made to support the use of the excavator and breaker to minimize the duration of rock removing activity and fish impacts. Based on data thus far, there is a very low likelihood that fish will be negatively impacted to a significant degree at night. Plans are underway to move forward with construction without additional mitigation spill.**

**SEPTEMBER 7 UPDATE: TDA AWS project was briefed at the Sept. 7 FFDRWG. USACE is working with contracting on an Economy Act Order (PNNL) for vibration monitoring. USACE continues to work with the AWS contractor on scheduling. The contractor forecasts being done with common excavation within Oct. 16-31, during the night (1800-0600), and has proposed a different technique to begin bedrock removal in an effort to maximize schedule and reduce risk of going into a third year. This technique, referred to as rock ripping, consists of scraping or clawing rock rather than the more intrusive hydraulic fracturing. FFDRWG members supported this type of work during the last 7 days of Oct. with the same spill trigger as previously coordinated. No objections were expressed. Rock removal would start as far away from the ladder as possible and work toward the ladder as necessary.**

**AUGUST 28 UPDATE: To mitigate for potential delay impacts to migrating salmonids associated with the planned Oct 16-31 work, vibration of the East Fish Ladder support columns in the vicinity of the excavation area will be monitored and recorded during construction activities. Background levels of day and night vibration data will be collected from Oct. 9-15 (1 week) immediately prior to work. During the work period of October 16-31, a measurement of vibration on any day that exceeds 80 dB//1  $\mu\text{m}/\text{s}^2$  (0.01  $\text{m}/\text{s}^2$ ) (Anchor QEA, 2017 Lower Granite Adult Passage Evaluation – Sound and Vibration Characterization Report) or any vibration level above background levels that exceed this amount will trigger spill**

starting the following day and continuing until it can be demonstrated that the work does not exceed the background threshold for two consecutive days.

**AUGUST 10 FPOM UPDATE:** All work in November was approved. FPOM requests 15 kcfs daylight hours (1/2 hour before sunrise until 1/2 hour after sunset) north ladder attraction spill, Oct. 16-31, to minimize potential delay impacts associated with construction activity during nights Oct. 16-31.

**UPDATE Prior to August 10 FPOM:** FPOM concurred during the 14 July 2017 FPOM with working nights in November and the last 10 days of November starting at 1200. FPOM did not support work in October during day or night. Additional coordination is requested for 12-hour night shifts from 1800-0600 during Oct. 16-31 and day shifts during Nov. 12-20 starting at 1200.

The PDT and construction office discussed the schedule and identified remaining uncertainty surrounding the excavation of the 10 ft. valve room. In addition, USACE desires to reduce risk to worker safety and increase efficiency by minimizing 24hrs/7 day per week, i.e., double shifts for extended periods.

The following MOC has been modified to address fish manager concerns by rearranging schedule to minimize fish impacts, expand on description of potential construction impacts, and continue FPOM coordination in an effort to complete contract work during the second IWW period.

#### **Description of the problem**

The AWS project is behind schedule after season 1 due to weather and differing site conditions. In attempts to complete the project in season 2, an early start is requested for some of the work items. November night work was approved for season 1. Without additional weather or differing site conditions, an additional 40 shifts need to be scheduled in order for the project to be completed. In addition to the contractually awarded nights in November, nights are requested from October 16-October 31 and day shifts from November 12-20 are requested to perform in-water work for season 2. This totals 29 additional allowable shifts excluding Sundays. Without this extension, the work could potentially continue to a third season.

#### **Work Description:**

All heavy construction and diving will be scheduled for night work. Work items for area 1 include installing forebay erection frame by barge and installing forebay steel anchor beams to dam face by barge and diver. Area 1 is ~30' downstream from the east fish ladder exit.

**UPDATE:** All work identified in Area 1 **will not be pursued** during nights of Oct. 16-31 and days of Nov. 12-20.

Work items for area 3 include common earth excavation, dozer with ripper attachment, hydraulic hammering of concrete, and rock excavation for the 10' pipe. Some of this work area is ~45' from fish ladder.

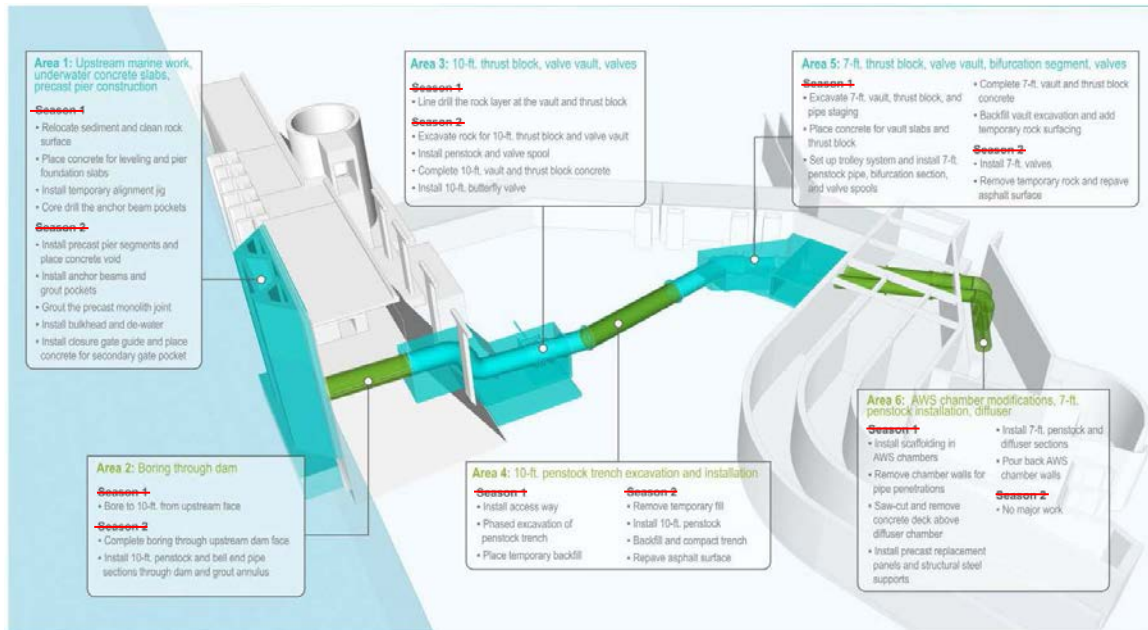
**UPDATE:** Due to differing site conditions identified during Season 1, concrete beams are in the exact location of the common earth excavation. The contractor must utilize additional time and effort to remove the concrete beams to stay on schedule. Common earth excavation, using backhoe(s), bulldozers, dump trucks, etc. would occur from ground elevation (EL 111.5) until the locations of the concrete beams (EL 104). At Elevation 104', the distance to the fish ladder is approximately 48'. Removal of the concrete beams would include hydraulic hammering of concrete and rock excavation. Initial excavation of the common fill is requested to occur during nights of Oct. 16-31. Hydraulic hammering of concrete is requested to occur during days of Nov. 12-20.

Work items for area 4 include common earth excavation for the 10' penstock. This work varies from ~30' from the fish ladder at the 7' valve room to ~40' from the fish ladder at the 10' valve room.

**UPDATE:** Excavation of common fill from the area will utilize heavy equipment, including dump trucks, backhoe, bull dozer, and track hoe. These efforts are identical in nature to those performed in March 2017 in Work Area 5. Little noise/vibration impact was observed during that time. Common excavation efforts in this work area are requested to occur during nights of Oct. 16-31.

Work items for area 5 include crane to install valves and lids and electrical installation. This work is ~30 directly under the fish ladder.

**UPDATE:** All work identified in Area 5 will not be pursued during nights of Oct. 16-31 and days of Nov. 12-20.



**Figure 1 - TDA AWS features and work areas**

**Type of outage required** - No outage required.

**Impact on facility operation** (FPP deviations) - No operations changes.

Working within 50 ft. of a fishway and within 100 ft. of an exit.

15 kcfs attraction spill. When working within 50 feet of the ladder or 100 feet of an exit and exceeded the vibration threshold.

**Impact on unit priority-** None expected

**Impact on forebay/tailwater operation** - None expected

**Impact on spill** - 15 kcfs daylight hours' attraction spill will begin if the vibration threshold criteria has been met. If work does not exceed the threshold for two consecutive days, north ladder attraction spill will not be required unless vibration criteria is met or exceeded again.

**Dates of impacts/repairs** – Oct 16 – Nov 30, 2017

**UPDATE: Additional coordination for 12-hour night shifts from 1800-0600 during Oct. 16-31 and day shifts during Nov. 12-20 starting at 1200.**

**Length of time for repairs** – 6 weeks overall

**Analysis of potential impacts as a result of a 3<sup>rd</sup> construction season in FY19, TDA project impacts, and other contract work:**

1. Additional schedule - Due to impacts from Season 1, the Contractor will have to accelerate operations in work area 6, installation of the diffuser and 7' penstock expansion joints. The Contractor will need to make up approximately 40 shifts during the fish ladder outage. Double shifted (24/7) work creates both a quality concern and a safety impact. The level of effort in Quality Management is lost between change-out of crews from shift to shift. Fatigue Management and employee cognizance is at risk and can result in both quality and safety issues. This also takes a toll on employees' moral. In addition, by directing acceleration and moving to a 24/7 or double shifted work schedule, the Contractor will experience a significant inefficiency factor, causing additional shifts to be incurred.

In addition to the work noted above, the Government must direct the Contractor to accelerate 40 shifts of work within work areas 3 & 4. In an attempt to mitigate the potential safety and quality impacts of working double shifts, the additionally requested shifts will allow acceleration of work to one type of activity at a time. This will allow staggering of night work between subcontractors and greater oversight by Contractor and Government quality and safety personnel.

2. Work area 3 includes excavation of material not yet disturbed during this contract which includes a risk of additional differing conditions. Furthermore, the increased quality and safety risk associated with the anticipated double shifts in the fish ladder increase the likelihood of delays to contract work and decrease the amount of time left to react. Without extending the IWWP in addition to acceleration efforts, this contract has potential to extend into a third season during FY19.
  
3. Currently there are numerous contracts scheduled and being planned for active construction at The Dalles Dam in the location of AWS Backup work during the IWWP of FY19: Fish Unit Breaker, SR Panel Replacement, GSU Transformer, and Rail Road Removal. If the East Fish Ladder is taken out of service for three consecutive years, the North Fish Ladder will have missed several opportunities for maintenance and rehabilitation. Each of these projects has the potential for cost and schedule impacts by extending TDA AWS into a third season.

### Analysis of potential impacts to fish

1. Table 1 shows the 10 year average passage for all chinook, all steelhead, coho, and lamprey during October, with average counts during Oct. 15-31 bolded (DART data). Average daily passage through the north ladder is less numerous than the east ladder. Approximately 5-20% pass the north fish ladder and are not exposed to the work area. Chinook, steelhead, and coho passage numbers decline through Oct. with very few lamprey passing after Oct. 15.

**Table 1 – TDA October average daily passage, 2005-2016**

Date	All Chinook	All steelhead	Coho	Lamprey
1-Oct	3648	3345	749	6
2-Oct	3562	2968	757	2
3-Oct	3472	2744	771	1
4-Oct	2882	2073	597	
5-Oct	3022	2181	692	
6-Oct	2937	2200	808	4
7-Oct	2369	1905	855	
8-Oct	1937	1667	604	2
9-Oct	1950	1494	376	1
10-Oct	2264	1243	272	1
11-Oct	2186	1445	481	1
12-Oct	1885	1397	834	
13-Oct	1582	1321	632	1
14-Oct	1234	973	322	1
<b>15-Oct</b>	<b>1173</b>	<b>1083</b>	<b>555</b>	
<b>16-Oct</b>	<b>1318</b>	<b>1336</b>	<b>810</b>	

17-Oct	1031	1120	774	
18-Oct	910	826	401	
19-Oct	755	810	530	-1
20-Oct	805	902	482	
21-Oct	606	668	198	
22-Oct	665	661	149	
23-Oct	579	524	183	
24-Oct	533	605	344	
25-Oct	514	501	233	
26-Oct	446	467	170	
27-Oct	382	509	159	
28-Oct	335	506	189	
29-Oct	295	332	108	
30-Oct	250	316	116	1
31-Oct	230	292	67	

2. November night work was previously analyzed for season 1 (USACE count data). For day work in November, the average counts are listed with Nov. 12-20 bolded in Table 2. Average daily passage through the north ladder is less numerous than the east ladder. Approximately 5-20% pass the north fish ladder and are not exposed to the work area. Chinook, steelhead, and coho passage numbers continue to decline through Nov.

**Table 2 - TDA-E and TDA-N November average daily passage, 2003-2007 and 2012**

Date	All Chinook		All Steelhead		All Coho		Total Fish	
	TDA-E	TDA-N	TDA-E	TDA-N	TDA-E	TDA-N	TDA-E	TDA-N
1-Nov	190	18	248	30	159	28	1193	152
2-Nov	148	15	221	21	66	17	871	105
3-Nov	130	14	220	19	49	6	799	77
4-Nov	124	16	254	28	113	27	980	141
5-Nov	111	17	223	24	119	15	905	113
6-Nov	125	17	208	18	70	9	804	86
7-Nov	110	13	180	10	33	8	647	60
8-Nov	71	11	125	9	25	5	444	50
9-Nov	71	10	153	13	17	2	482	51
10-Nov	60	11	138	12	8	3	414	51
11-Nov	54	6	163	15	9	3	452	47
<b>12-Nov</b>	<b>52</b>	<b>7</b>	<b>160</b>	<b>11</b>	<b>18</b>	<b>6</b>	<b>459</b>	<b>47</b>
<b>13-Nov</b>	<b>51</b>	<b>6</b>	<b>198</b>	<b>11</b>	<b>12</b>	<b>7</b>	<b>524</b>	<b>47</b>
<b>14-Nov</b>	<b>46</b>	<b>5</b>	<b>200</b>	<b>10</b>	<b>8</b>	<b>1</b>	<b>510</b>	<b>30</b>
<b>15-Nov</b>	<b>42</b>	<b>5</b>	<b>240</b>	<b>10</b>	<b>8</b>	<b>1</b>	<b>579</b>	<b>32</b>
<b>16-Nov</b>	<b>39</b>	<b>7</b>	<b>207</b>	<b>13</b>	<b>5</b>	<b>1</b>	<b>252</b>	<b>21</b>
<b>17-Nov</b>	<b>34</b>	<b>13</b>	<b>163</b>	<b>39</b>	<b>9</b>	<b>4</b>	<b>206</b>	<b>56</b>
<b>18-Nov</b>	<b>30</b>	<b>4</b>	<b>149</b>	<b>8</b>	<b>16</b>	<b>3</b>	<b>195</b>	<b>15</b>
<b>19-Nov</b>	<b>27</b>	<b>5</b>	<b>140</b>	<b>11</b>	<b>9</b>	<b>4</b>	<b>176</b>	<b>20</b>
<b>20-Nov</b>	<b>23</b>	<b>4</b>	<b>139</b>	<b>7</b>	<b>7</b>	<b>2</b>	<b>170</b>	<b>13</b>
21-Nov	23	6	108	5	4	0	135	11
22-Nov	16	7	106	7	4	1	126	15

23-Nov	19	2	101	4	2	0	121	6
24-Nov	16	3	68	7	3	1	86	11
25-Nov	14	4	77	6	5	1	96	11
26-Nov	15	2	64	8	3	1	82	11
27-Nov	10	1	50	5	4	-1	64	6
28-Nov	9	2	42	3	1	0	52	4
29-Nov	6	2	28	4	0	0	35	6
30-Nov	8	3	26	5	1	0	35	8

3. The NOAA forecast is lower than 10 year average.
4. There is no night passage data for October and November available.

**Summary statement - expected impacts on:**

**Upstream migrants (including Bull Trout)**

Given the trends in passage over recent years, it is possible that chinook, steelhead and coho could experience some delay if elevated levels of vibration or noise were detectable by fish. The levels of noise or vibration from the activity in October and November in work areas 3 and 4 are not well understood regarding the ability of fish to detect with negative responses when passing the TDA-E.

Any fish that are in the area during nights Oct. 16-31 may experience some delay in passage if present in TDA-E. It is possible that fish may back down the ladder or exit to the forebay. If they back down overnight, it is expected that passage will resume during the day under typical project operating conditions.

Any fish that are present during the day after 1200 during Nov. 12-20 may experience some delay at the TDA-E. It is possible that fish may back down the ladder or exit to the forebay if they react to work in the area. Delaying the start times until 1200 allows significant time for fish to pass during daytime hours without the potential impacts from construction. Those that back down may also utilize the north ladder as an alternate route.

Given the type of work based on last year's observations, work areas and distance from the ladder, as well as scheduling work to not be continuous, the noise and/or vibration impacts on adult salmonids in the worst case are expected to be short term (<24 hrs) and non-lethal.

**Downstream migrants** - There are no downstream migrants near this location.

**Lamprey** - There is no expected lamprey impact, there is generally no lamprey passage after October 15.

**Comments from agencies**

**November 8 update**

-----Original Message-----



From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov]  
Sent: Thursday, November 09, 2017 9:27 AM  
To: Kovalchuk, Erin H CIV USARMY CENWP (US)  
<Erin.H.Kovalchuk@usace.army.mil>  
Cc: Blane Bellerud <Blane.Bellerud@noaa.gov>  
Subject: [EXTERNAL] Re: FPOM: TDA AWS Update follow-up on dive  
corrective action

Erin, Based on this and what I heard at the meeting yesterday, I personally don't have any other issues with this work. Blane Bellerud wasn't at the meeting yesterday but may have more to add since he is now our primary POC for The Dalles issues. By the way, I still think they should change that term hydro-blasting to power washing! Thanks, Gary

On Thu, Nov 9, 2017 at 8:40 AM, Kovalchuk, Erin H CIV USARMY CENWP (US) <Erin.H.Kovalchuk@usace.army.mil <mailto:Erin.H.Kovalchuk@usace.army.mil> > wrote:

FPOM members-

Per the TDA AWS update yesterday on the diving at work area #1 during days, hours 1200-1800 from Nov. 12-20, there will be no grouting or pouring of concrete only hydro-blasting. The contractor had intended to grout but that will be delayed. Please let me know immediately if there are any issues with this work.

Erin Kovalchuk  
Columbia River Coordinator  
Portland District  
US Army Corps of Engineers  
541-705-5310 <tel:541-705-5310> blackberry

**September 7 update:**

-----Original Message-----

From: Erick VanDyke [mailto:Erick.S.VanDyke@state.or.us]  
Sent: Wednesday, October 25, 2017 11:53 AM  
To: Rerecich, Jonathan G CIV USARMY CENWP (US)  
<Jonathan.G.Rerecich@usace.army.mil>; lort@critfc.org; Erick VanDyke  
<erick.s.vandyke@state.or.us>; Charles Morrill  
(charles.morrill@dfw.wa.gov) <charles.morrill@dfw.wa.gov>;  
Kiefer,Russell <russ.kiefer@idfg.idaho.gov>; david\_swank@fws.gov; Blane  
Bellerud - NOAA Federal <blane.bellerud@noaa.gov>; Scott Bettin  
<swbettin@bpa.gov>  
Cc: Mackey, Tammy M CIV USARMY CENWP (US)  
<Tammy.M.Mackey@usace.army.mil>; Kovalchuk, Erin H CIV USARMY CENWP  
(US) <Erin.H.Kovalchuk@usace.army.mil>;  
Subject: [EXTERNAL] RE: FPOM: Official Coordination 17TDA20 MOC AWS  
Revised 24OCT2017

Jon,

Given our earlier discussion, it seems most appropriate to include the spill mitigation with this action. Say start now so at a minimum the effort will appear to address concerns with adult passage—even if it is roughly a third of the passage moving away from the route interacting with the vibration. Thanks.

Erick S. Van Dyke

Oregon Dept of Fish & Wildlife

Fish Passage/Mitigation Technical Analyst

17330 SE Evelyn Street

Clackamas, OR 97015

971-673-6068 Office

-----Original Message-----

From: Rerecich, Jonathan G CIV USARMY CENWP (US)

Sent: Wednesday, October 25, 2017 9:12 AM

To: Blane Bellerud - NOAA Federal <blane.bellerud@noaa.gov>; Kovalchuk, Erin H CIV USARMY CENWP (US) <Erin.H.Kovalchuk@usace.army.mil>; Cordie, Robert P CIV CENWP CENWD (US) <Robert.P.Cordie@usace.army.mil>; Gary Fredricks <gary.fredricks@noaa.gov>; Scott Bettin <swbettin@bpa.gov>

Subject: RE: [EXTERNAL] Re: FW: FPOM: Official Coordination 17TDA20 MOC AWS Revised 24OCT2017

A couple points of clarification. Rock breaking activity is scheduled to happen tonight from 11 pm - 3 am. This is a critical path activity that has been on hold for two nights since we coordinated this type of activity to occur Oct. 25-31. The Corps' decision to move forward without mitigation spill has been based on input from BPA and NOAA staff.

Thank you for helping us get this important work completed.

Respectfully,

Jon

-----Original Message-----

From: Rerecich, Jonathan G CIV USARMY CENWP (US)

Sent: Wednesday, October 25, 2017 7:16 AM

To: 'Blane Bellerud - NOAA Federal' <blane.bellerud@noaa.gov>;

Kovalchuk, Erin H CIV USARMY CENWP (US)

<Erin.H.Kovalchuk@usace.army.mil>; Cordie, Robert P CIV CENWP CENWD

(US) <Robert.P.Cordie@usace.army.mil>; Gary Fredricks

<gary.fredricks@noaa.gov>; 'Bettin, Scott W (BPA) - EWP-4'

<swbettin@bpa.gov>

Subject: RE: [EXTERNAL] Re: FW: FPOM: Official Coordination 17TDA20 MOC AWS Revised 24OCT2017

Spilling before the rock breaking operation was discussed on the call. As discussed, the spill operation would be a proactive attempt to pull fish to the north ladder prior to the activity that night. Based on the vibration data collected and the type of construction activity, rock breaking is expected to be more of an impact than we have seen so far. Also discussed was the uncertainty of the biological impact and benefit of spill. There was general agreement that even under the

worst case scenario i.e., rock breaking, the expected short duration estimate of 4 hours (as opposed to the seven nights that was in the Sept. MOC) would not be a significant impact. BPA indicated they would not support any additional mitigation spill for the rest of the month.

I looped BPA into the conversation and if there are any other comments or questions, please let us know.

Thank you,

Jon

-----Original Message-----

From: Blane Bellerud - NOAA Federal [mailto:blane.bellerud@noaa.gov]  
Sent: Tuesday, October 24, 2017 5:25 PM  
To: Kovalchuk, Erin H CIV USARMY CENWP (US)  
<Erin.H.Kovalchuk@usace.army.mil>; Rerecich, Jonathan G CIV USARMY CENWP (US) <Jonathan.G.Rerecich@usace.army.mil>; Cordie, Robert P CIV CENWP CENWD (US) <Robert.P.Cordie@usace.army.mil>; Gary Fredricks <gary.fredricks@noaa.gov>  
Subject: [EXTERNAL] Re: FPOM: Official Coordination 17TDA20 MOC AWS Revised 24OCT2017

As I remember the call, there was an offer to spill the day before the rock breaking operation to draw fish away from the east ladder in advance.

Blane

-----Original Message-----

From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov]  
Sent: Tuesday, August 29, 2017 9:46 AM  
To: Kovalchuk, Erin H CIV USARMY CENWP (US)  
<Erin.H.Kovalchuk@usace.army.mil>  
Cc: Rerecich, Jonathan G CIV USARMY CENWP (US)  
<Jonathan.G.Rerecich@usace.army.mil>; Scott Bettin <swbettin@bpa.gov>  
Subject: [EXTERNAL] Re: FPOM: Official Coordination 17TDA20 MOC AWS Oct start revised 28Aug2017

Erin, My previous edits have been incorporated and I have nothing else to add. Thanks, Gary

### **Final coordination results –**

#### **Minutes from 14 July 2017 FPOM:**

**6.18 17TDA20 MOC AWS October Start** – Due delays caused by the weather problems last year, the project is proposing starting in October for night work, November nights and daytime work the last two weeks of November. There are three areas for working. Area 1 is on the forebay side and with eddy recirculation, the water comes right down to the east fish ladder exit. Area 3 and 4 are near the east entrance. Fredricks is very concerned about working in October right under the ladder. **FPOM concurred with working nights in November and the last 10 days of November starting at noon but not in October.**

#### **Minutes from 10 August FPOM:**

**6.1 17TDA20 MOC Oct start revised** – After the last FPOM, the PDT reviewed the schedule and decided that without additional time, the project would extend to a third season. In order to reduce fish impacts, the work has been revised to only areas 3 and 4. The PDT needs to add 29 additional shifts to the schedule. The concrete demolition has been moved to November nights. FPOM recommends reviewing PIT data to see if fish are going back down the ladder. Fredricks recommended against the October work but if the work had to be done he suggested the project could spill during this period to attract fish to the north ladder. Only earth removal is planned in October. Night time is defined as 6pm – 6 am. **ACTION: Rerecich will update the MOC to reflect the request for spill for BPA to review.** A third season will cost too much money. **FPOM concurs with the November day work and the October nights starting on the 16th if mitigation is available.** March is being scheduled now.

**After Action update** (After action statement stating what the effect of the action was on listed species. This statement could simply state that the MOC analysis was correct and the action went as expected, or it could explain how the actual action changed the expected effect (e.g., you didn't need to close that AWS valve after all, so there was no impact of the action). List any actual mortality noted as a result of the action)

Please email or call with questions or concerns.

Thank you,  
Erin

Erin Kovalchuk  
NWP Operations Division Fishery Section  
Columbia River Coordination Biologist  
[Erin.H.Kovalchuk@usace.army.mil](mailto:Erin.H.Kovalchuk@usace.army.mil)

Bob Cordie  
Chief of Fisheries  
The Dalles Dam  
[Robert.P.Cordie@usace.army.mil](mailto:Robert.P.Cordie@usace.army.mil)

Jon Rerecich  
Fish Passage Section  
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503-808-4779  
[Jonathan.g.rerecich@usace.army.mil](mailto:Jonathan.g.rerecich@usace.army.mil)