

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

COORDINATION TITLE- 13BON32 NDE LFS ROV inspection

COORDINATION DATE- 26 June 2013

PROJECT- Bonneville Lock and Dam

RESPONSE DATE- This is a notification of an action that has already occurred.

Comments are still welcome.

Description of the problem- The Corps performed an unplanned ROV inspection of the new Lamprey Flume System (LFS) at the Washington Shore Fish Ladder on June 26 to investigate whether there were any openings in the LFS that might attract and entrain salmon or other fish. Between June 7 and June 19, several people reported seeing large boils of water and air emanating from the LFS. Further review suggested that there was more entrained air in the gravity water supply system than was anticipated and that the large boil occurred when the valve controlling the water supply was set at approximately 70%-100% open (highest flow settings). Review of video submitted by Bonneville Project Fisheries showed that the boil consistently appeared at the surface above a particular section of the LFS (**Figures 1 and 2**).

On 20 June, the Corps shut down the LFS due to concerns that the boil appeared too large to be weeping from closed access hatches and thus may be coming from an open hatch or a damaged/compromised section of the LFS. The concern was that any larger openings could attract and entrain salmon, steelhead, or shad and cause a serious passage problem. Sean Tackley (Fish Passage Section, Portland District, USACE) sent an informal e-mail update to key FPOM representatives and tribal lamprey representatives to describe the situation and notify the region of the Corps' intent to perform an ROV inspection as soon as possible.

The purpose of the ROV inspection was to investigate whether there were any openings (open hatches or damage) in the flume, aside from the two main upper and lower entrances. June 26 was identified as the first date available to perform this inspection.

Type of outage required- Temporary disruption of normal adult fish ladder operations to accommodate an inspection of the Washington Shore Lamprey Flume System. Both north monolith entrances were closed. Fish Units 1 and 2 were off. Main Units 17 and 18 were off. The ladder had no AWS flow.

Impact on facility operation- The Washington shore fishway was out of criteria, as was the Cascades Island fishway (see MOC 13BON26). The inspection required temporary closure of the North Upstream and North Downstream entrances (NUE and NDE) of the Washington Shore Fish Ladder, temporary outages of Fish Units 1 and 2, and temporary outage of MU17 and MU18 at Powerhouse 2. The LFS water supply was temporarily turned back on during the ROV to facilitate identification of any openings and diagnosis of the solution.

Length of time for repairs- 1.5 hours. The NUE and NDE were closed from 10:30 – 12:00 on June 26. Fish Unit 1 was OOS from 10:34 – 12:22 (1 hour, 48 minutes) and Fish Unit 2 was OOS from 10:34 - 12:15 (1 hour, 41 minutes).

Expected impacts on fish passage- Due to the short duration, the time of year (no sea lion predation), and the fact that Bradford Island fishway remained in FPP criteria during the ROV inspection, there was likely little impact on adult salmonids or lamprey as a result of the operation. The operation may have caused minor delays in finding fishway entrances. A brief analysis of daily fish counts from June 23-27 suggests no obvious changes in Bonneville Dam passage at this time scale (**Table 1**).

Comments from Bonneville Project Fisheries-

Comments from agencies-

Final results- The ROV inspection was only a partial success due to flow conditions and a follow-up inspection in the near future is required to verify that the Lamprey Flume System can be operated without impacting salmonids. The Corps is currently discussing an alternative means of inspection, given observed conditions. Any further ROV inspections will be coordinated with FPOM.

The following ROV inspection synopsis was provided by Todd Manny (Diving/ROV Operations and Safety, USACE Portland District):

“Due to the river conditions, we were only able to inspect the top of the structure. We inspected the Lower Flume top side hatches, upstream PIT tag antennae, upper mounting bolts and Upper Flume hatches that are below the water line. I could not get too close to the vertical guide bar attachment points (due to possible entanglement) but from a distance, they appeared intact. All items inspected appeared to be in ‘as installed’ condition except the hatch and seal just out of the water. There appears to be a +/- 2-inch piece of the hatch seal sticking out but the hatch is secured.”

Please email or call with questions or concerns:

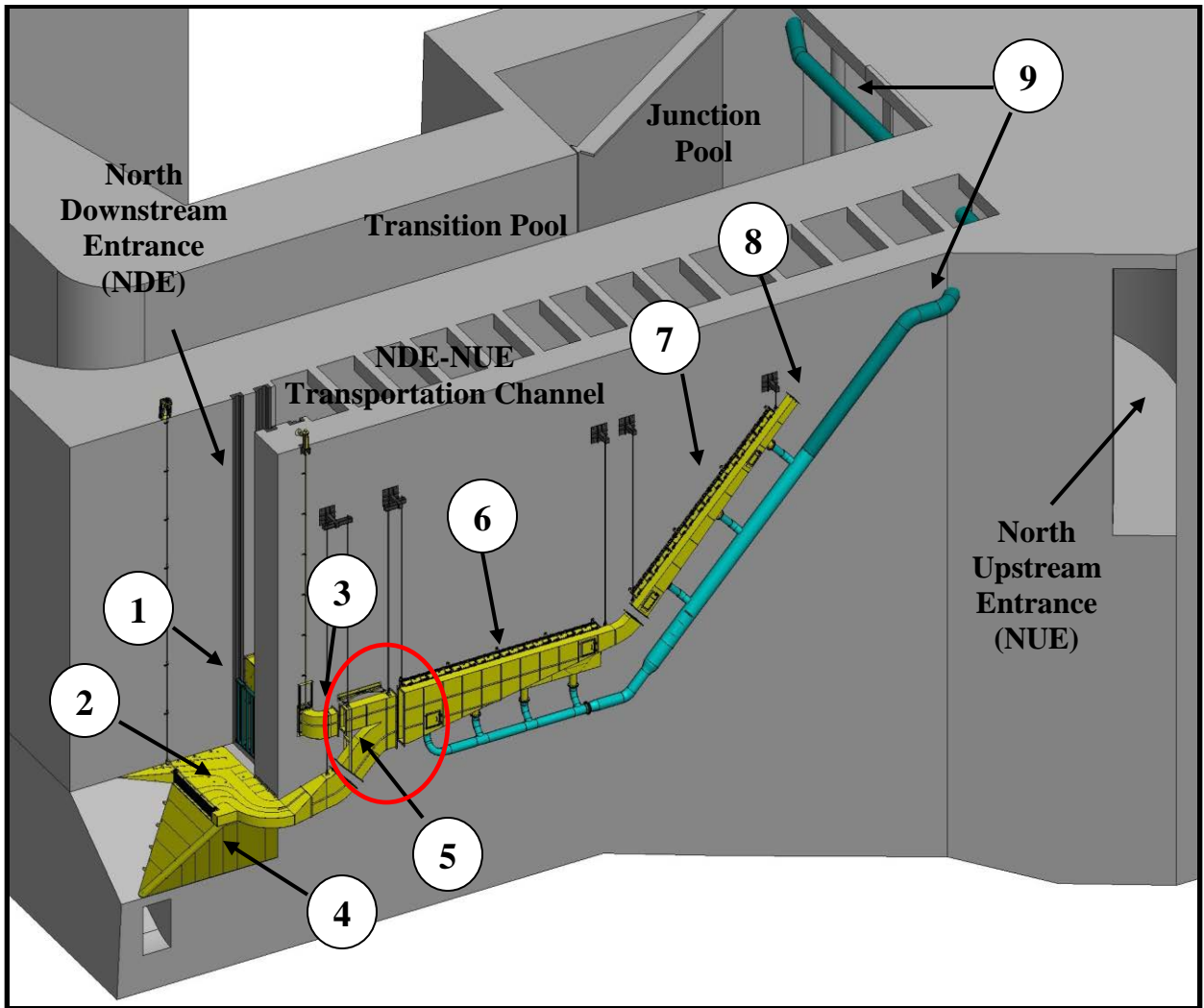
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Figure 1. Boil of water and air emanating from the Lamprey Flume System (LFS). This boil appears when the valve controlling water supply to the LFS is set at approximately 70% open or greater. The Corps is concerned that the boil may indicate either an open access hatch or physical damage to the flume, either of which would pose a fish passage risk. The purpose of the ROV inspection was to verify that this is not the case.



1. Upper Entrance
2. Lower Entrance
3. Thimble, Closure Gate, and Elbow Flume Section
4. Filler Plate
5. Flow Splitter Flume Section
6. Downstream "School Bus" Flume Section
7. Upstream Flume Section
8. Lamprey Flume System (LFS) & Lamprey Passage Structure (LPS) Junction (LPS not shown)
9. Gravity Water Supply Pipe

Figure 2. Isometric rendering of the Bonneville Washington Shore Lamprey Flume System. The boil of water and air being investigated has been seen at the water surface, just above the area circled in red. The four gaps between flume sections (yellow) are where PIT antennas are located.

Table 1. Daily window counts of adult salmonids, Pacific lamprey, and shad at Bonneville Dam from June 23-27, 2013.

Bonneville Washington Shore Ladder Counts								
Date	Chinook	Steelhead	Coho	Sockeye	Chum	Pink	Lamprey	Shad
6/23/2013	2030	132	0	4116	0	0	209	9799
6/24/2013	1090	118	0	3842	0	0	35	4189
6/25/2013	1247	130	0	4093	0	0	50	4291
6/26/2013	1259	115	0	4463	0	0	47	2951
6/27/2013	1221	155	0	3593	0	0	72	2352

Bonneville Bradford Island Ladder Counts								
Date	Chinook	Steelhead	Coho	Sockeye	Chum	Pink	Lamprey	Shad
6/23/2013	847	74	0	3100	0	0	134	55098
6/24/2013	867	75	0	2273	0	1	84	12096
6/25/2013	1337	85	0	2724	0	0	88	10096
6/26/2013	1176	119	0	4538	0	0	64	16018
6/27/2013	703	104	0	2910	0	0	46	11209