# Fish Passage Plan (FPP) Change Form

**Change Form # & Title**: 22LGS004 – ASW Crest Elevation

**Date Submitted**: 25 May 2022

**Project**: Little Goose Dam

**Requester Name, Agency**: Chuck Barnes, USACE Little Goose Dam Fisheries

**Final Action:**

**FPP Section**: 2.3.2.7. Adjustable Spillway Weir (ASW)

**Justification for Change**: This Fish Passage Plan (FPP) change form is to propose criteria to adjust the operation of the ASW at Little Goose Dam. Currently, the ASW is set to one of two specific crest elevations relative to river flow to provide a surface route for fish passage and to optimize tailrace conditions for egress. Unlike the previous spillway weir which required a crew and crane to adjust the ASW, the current ASW can be automatically adjusted from the control room; however the FPP has not been updated to accommodate any changes other than to adjust the elevation relative to river flow.

The current FPP spill patterns assume a specific spill rate through the ASW at both crest elevations with the forebay in the MOP range (633-634.5’). Throughout the spill season, the forebay elevation may need to be increased above MOP to maintain safe navigation, which increases the flow rate through the ASW.

This proposed change would adjust the ASW elevation relative to an increase in MOP elevation in order to maintain the intended amount of spill over the ASW (approximately 7-8 kcfs at high crest and 11-12 kcfs at low crest). The proposed change would only adjust the ASW elevation when operating in a raised MOP range (Table 1) and would not account for hourly or day to day forebay elevation fluctuations within that range.

Table 1. ASW crest elevation relative to minimum forebay elevation.

|  |  |  |
| --- | --- | --- |
| **Minimum Forebay Elevation** | **ASW-Hi Elevation** | **ASW-Lo Elevation** |
| 633’(MOP) | 622’ | 618’ |
| 634’ (1’ Raised MOP) | 623’ | 619’ |
| 635’ (2’ Raised MOP) | 624’ | 620’ |
| 636’ (3’ Raised MOP) | 625’ | 621’ |

**Proposed Changes**: Add criteria to adjust the ASW crest elevation at different raised MOP elevations to maintain the intended amount of spill over the ASW. For example, when LGS is operating in a 1’ raised MOP, the ASW would be raised 1’, etc.

**2.3.2. Juvenile Facilities – Fish Passage Season (April 1 – third week of December).**

**2.3.2.7. Adjustable Spillway Weir (ASW).**

**2.3.2.7.a.** Little Goose has one adjustable spillway weir (ASW) in spillbay 1 that provides a surface route for fish passage. The ASW can be operated from the control room and the crest elevation can be adjusted lower or higher to pass more water or less water, respectively, according to the flow and forebay criteria defined below. The ASW spill rate is a function of the crest elevation versus forebay elevation – as the pool elevation over the crest increases, more water is spilled over the ASW. Therefore, in order to maintain the intended spill rate over the ASW (approximately 7-8 kcfs at high crest and 11-12 kcfs at low crest), the ASW crest elevation will be set relative to the forebay operating range, as defined below:

**Table LGS-5. ASW Crest Elevation Relative to Forebay Range to Maintain High Crest Spill at ~7-8 kcfs and Low Crest Spill at ~11-12 kcfs.**

|  |  |  |
| --- | --- | --- |
| **LGS Forebay Operating Range** **(ft)** | **ASW High Crest Elevation (ft)****= ~7-8 kcfs spill** | **ASW Low Crest Elevation (ft)****= ~11-12 kcfs spill** |
| MOP (633.0 - 634.5) | 622’ | 618’ |
| 0.5’ Raised MOP (633.5 - 635.0) | 622.5’ | 618.5’ |
| 1’ Raised MOP (634.0 - 635.5) | 623’ | 619’ |
| 1.5’ Raised MOP (634.5 - 636.0) | 623.5’ | 619.5’ |
| 2’ Raised MOP (635.0 - 636.5) | 624’ | 620’ |
| 2.5’ Raised MOP (635.5 - 637.0) | 624.5’ | 620.5’ |
| 3’ Raised MOP (636.0 - 637.5) | 625’ | 621’ |
| 3.5’ Raised MOP (636.5 - 638.0) | 625.5’ | 621.5’ |

**2.3.2.7.b. High Crest (ASW-Hi):**

The ASW high crest spills approximately 7–8 kcfs when operated relative to the forebay elevation (**Table LGS-5**). High crest spill patterns are in **Table LGS-7** (Spring Spill) and **Table LGS-8** (30% Spill).

*Unless flow conditions defined below are met, ASW spill for fish passage will occur with the ASW at high crest (approximately 7-8 kcfs spill)*.

**2.3.2.7.c. Low Crest (ASW-Lo):**

The ASW low crest spills approximately 11–12 kcfs when operated relative to the forebay elevation (**Table LGS-5**). Low crest spill patterns are in **Table LGS-7** (Spring Spill) and **Table LGS-9** (30%).

Change the ASW to low crest to pass more water during high flow (i.e., spring freshet) when the following flow criteria are met: 1) day average total project outflow above 85 kcfs, and 2) NWRFC inflow forecast above 85 kcfs for at least the next 3 days. When day average outflow drops below 85 kcfs and is forecasted to stay below 85 kcfs for at least the next three days, change back to high crest.

**COMMENTS**:

**RECORD OF FINAL ACTION**: