# Fish Passage Plan (FPP) Change Form

**Change Form # & Title**: 21LWG006 – Clarify RSW Criteria and Spill Rate

**Date Submitted**: 2 September 2021

**Project**: Lower Granite Dam

**Requester Name, Agency**: Lisa Wright, Corps

**Final Action: APPROVED – 9 September 2021**

**FPP Section**: Chapter 9 LWG, section 2.3.2.6. RSW Operating Criteria.

**Justification for Change**:

Currently the FPP calls for operating the Lower Granite RSW through August 31 and closing the RSW “*if river flow is too low to maintain RSW spill and minimum generation requirements*”. In 2021, there was confusion as to whether this meant the RSW should stay closed for the rest of the season or re-opened as flows allowed.

This Change Form adds a sentence to clarify that the intent is to keep the RSW open to maintain PIT-tag detection whenever flows are high enough, as approved in Change Form [21LWG004](https://pweb.crohms.org/tmt/documents/fpp/2021/changes/21LWG004_RSW-August-Operation.docx).

Also, this Change Form adds RSW spill rates over the normal forebay operating range of elevations. The hourly project data report is being updated in September 2021 to calculate RSW spill based on the forebay. Therefore, by the time the RSW is operated for fall spill in October 2021, the hourly data website will report the RSW spill rate based on the current observed forebay elevation.

**Proposed Change**: *(see following pages for edits to existing FPP in track changes)*

**Comments**:

9/9/21 FPOM:

* Hesse requested adding ½ ft increments to the table of RSW spill vs forebay. Wright will add that in.
* Van Dyke asked why RSW spill doesn’t increase linearly with the forebay. The first few feet it’s 1 kcfs/ft, then it increases from there. Wright will inquire with Ryan Laughery and add that info to this change form (see Laughery’s response below).
* Van Dyke requested adding spill vs fb values to the other projects as well. Wright will make that change.

9/9/21 email from Ryan Laughery, Corps NWW: “The basic equation for weir flow is not a line of Ax+B, but fits a curve of Ax^(1.5). Same form of equation at all other weirs, not just Lower Granite.”

**Record of Final Action**: Approved as revised at FPOM on 9/9/21.

Proposed Change:

**2.3.2.6. Removable Spillway Weir (RSW).**

Lower Granite Dam has one removable spillway weir (RSW) in spillbay 1 that provides a surface route for fish passage. The RSW can be opened and closed from the control room.

The spill rate through the RSW is a function of the forebay elevation – as the pool elevation increases, more water is spilled over the RSW:

|  |  |
| --- | --- |
| **LWG Forebay Elevation (ft)** | **RSW Spill Rate (kcfs)** |
| 733  | 5.6  |
| 733.5  | 6.1  |
| 734  | 6.6  |
| 734.5  | 7.1  |
| 735  | 7.6  |
| 735.5  | 8.2  |
| 736  | 8.8  |
| 736.5  | 9.4  |
| 737  | 10.0  |
| 737.5  | 10.7  |
| 738  | 11.4  |

The RSW will be raised and operational during spill for juvenile fish passage, April 3–August 31 (**Appendix E**) and spill for adult steelhead (**section 2.2.2**):

Raise the spill gate to where it does not touch flow passing down the RSW (at least nine stops) and distribute spill according to patterns in **Table LWG-7**.

During high flow, if the Northwest River Forecast Center (NWRFC) inflow forecast for Lower Granite[[1]](#footnote-1) is above 200 kcfs, coordinate with RCC and CENWW-OD-T to initiate aggressive forebay debris removal so that RSW operation will not be impeded. If inflow exceeds 260 kcfs, the upstream river gauge flow is increasing, and the NWRFC inflow forecast is above 300 kcfs, stow the RSW (complete rotation to the landing pad).

If river flow is too low to maintain RSW spill and minimum generation requirements, close the RSW and spill the remaining outflow according to “No RSW” patterns in **Table LWG-8**. Re-open the RSW if flows increase sufficiently to support both RSW spill and minimum generation. The intent is to keep the RSW open to maintain PIT-tag detection to the extent possible as flows allow.

1. NWRFC inflow forecast for Lower Granite Dam: [www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?LGDW1](file:///C%3A%5CUsers%5CG0PDWLSW%5CDocuments%5CFish%20Passage%20Plans%5CFPP17%5CFPP17_Sections_Final%5Cwww.nwrfc.noaa.gov%5Criver%5Cstation%5Cflowplot%5Cflowplot.cgi%3FLGDW1) [↑](#footnote-ref-1)