

Flood Risk Management Requirements
Report #14 for Water Year 2022
Issue Date: 13 Jun 2022

A. Purpose of Flood Risk Management Requirements. These requirements provide maximum end-of-month reservoir elevations and/or minimum outflows for flood risk management projects in the Columbia River Basin. These requirements are for use by U.S. Army Corps of Engineers, Bureau of Reclamation, Idaho Power, Energy Keepers, BC Hydro and Bonneville Power Administration for operations planning and include all formally approved deviations to date. Any deviation from the flood risk management requirements herein will require approval from the Chief, Columbia Basin Water Management (CBWM) per the Northwestern Division's (NWD) Deviation Policy (NWDR 1110-2-6). Requirements are in accordance with the Columbia River Treaty Flood Control Operating Plan (FCOP) and any project-specific water control manuals, with variations as described below. These flood risk management requirements will be revised and re-issued as new information becomes available.

B. List of Approved Flood Deviations from Water Control Manuals.
None are currently in effect.

C. Flood Risk Management Requirements

These requirements have been prepared using the most recent official seasonal volume forecasts. The April-August volume forecast at The Dalles Dam based on the June 2022 official forecast is 88,101 kaf. Current forecast is now 98,148 kaf per the NWRFC. All other forecasts can be found in Table 2 or at: <https://www.nwd-wc.usace.army.mil/report/colsum/>

Table 1 shows the flood risk management elevations, draft and flow limits for the evacuation, holding and refill periods. See the FCOP for how the ICF is computed. More details on the values used can be found at: <https://www.nwd-wc.usace.army.mil/report/storcorr/>

D. System Flood Risk Management Refill Requirement Discussion.

A late season Atmospheric River event struck the Pacific Northwest on June 9 and has continued to move through the basin. This created a large amount of rainfall in two days, and rain persisted throughout the weekend (11-12 June). More rain is predicted the following weekend (18-19 June). FRM guidance is being adjusted to help manage this event and future risk. **The Control Flow has been decreased to 440 kcfs as measured at John Day, ranging from 430 to 450 kcfs**

The Initial Controlled Flow (ICF) based on the official May 2022 forecast was 312 kcfs, and the ICF date was 7 May based on the ICF calculated using the official April 2022 forecast. The Flood Risk Management Requirements shown in Table 1 are based on the official June 2022 seasonal runoff volume forecasts and modeling. Refill dates are also listed in Table 1.

E. Individual Project Flood Risk Management Requirements Discussion.

To manage conditions on the Pend O'Reille River, additional project operations are as follows:

- Operate Hungry Horse to target 14.5 ft stage on the Flathead River at Columbia Falls. Due to rapidly changing conditions, this may need to rise as high as 15 ft.
- SKQ operate to fill slowly to stay between 2892-2892.2 feet. Elevation will continue to rise on freeflow and will eventually surcharge the reservoir.
- Albeni Falls is on free-flow as of Jun 11.
- John Day will be filling to elevation 268 feet as needed to manage Vancouver stage to 16 feet.

Table 1. Flood Risk Management Requirements

Project	31 Jan	28 Feb	31 Mar	15 Apr	30 Apr	Date Refill Starts	31 May ³	30 Jun ³	31 Jul ³
MCDB (kaf) ²	1609	2810	4080	4080	4080	2 May	2448	286	0
ARDB (ft)	1430.1	1422.9	1414.1	1414.1	1414.1	5 May	1421.4	1444.0	1444.0
DCDB (ft) ⁵	1839.3	1812.5 ⁵	1807.7 ⁵	1807.7	1807.7	27 Apr	1834.5	1877.3	1892.0
LIB (ft) ⁴	2384.6	2363.9	2371.8	2370.7	2370.7	27 Apr	n/a	n/a	2459.0
LIB (kcfs)	n/a	n/a	n/a	n/a	~16	27 Apr	~12.3	~12.3	n/a
HGH (ft)	3542.2	3539.3	3539.3	3543.4	3542.5	1 May	n/a	n/a	3560.0
HGH (kcfs)	n/a	n/a	n/a	n/a	n/a	1 May	~7.5	~7.5	n/a
SKQ (ft)	n/a	n/a	n/a	2883.0	n/a	-	2890.0	2893.0	2893.0
ALF (ft) ¹	2060.0	2060.0	2056.0	n/a	2056.0	-	2062.5	2062.5	2062.5
GCL (ft)	1290.0	1290.0	1271.5	1258.2	1250.7	6 May	1260.0	1285.0	1290.0
BRN (ft)	2077.0	2053.7	2059.1	2069.1	2077.0 ⁶	6 May	2077.0	2077.0	2077.0
DWR (ft)	1527.8	1518.6	1528.6	1559.5	1540.0 ⁶	6 May	1588.0 ⁶	1600.0	1600.0

Notes:

1. Albeni Falls flood risk management elevations are based on readings at the Hope gage.
2. KAF units refer to required flood risk management space (draft) in the reservoir.
3. Flood risk management requirements for May, June and July are based on estimated normal runoff shape. Under certain circumstances, the Refill Guide Curve (also known as Flood Control Refill Curve) procedure may be used to determine when refill is to begin at each project where applicable.
4. Per the Libby Dam WCM, Rule 1 of the VarQ operating procedures, releases will be limited to the hydraulic capacity of the powerhouse to the best extent possible.
5. Per the Duncan Storage Resevation Diagram, Duncan Reservoir is required to achieve its full flood risk management draft requirement of 1807.7 ft by 15 March.
6. Dworshak is operating to local FRM requirements for the end of May.

Table 2. Water Supply Forecasts (Kaf)

Project	Forecast Period	Jan	Feb	Mar	Apr	May	Jun	Jun 13 th NWRFC	Current month Forecast % of Normal	Residual Runoff ² (%)
MCDB	Apr-Aug	13115	13050	12846	12727	12507	12344	12370	111	77%
ARDB	Apr-Aug	25497	25513	24959	24662	24656	24445	23078	104	70%
DCDB	Apr-Aug	2361	2398	2339	2314	2226	2253	2622	129	73%
LIB	Apr-Aug	7273	7249	6972	6992	6740	6276	6912	114	62%
HGH	May-Sep	1920	1810	1700	1600	1910	1900	2168	123	50%
SKQ ¹	Apr-Jul	5742	5676	6049	6057	5472	5709	6988	114	49%
ALF ¹	Apr-Jul	11262	11353	11867	11845	10821	11765	13538	109	43%
GCL ¹	Apr-Aug	60042	61575	61433	61846	57157	59431	66561	114	60%
BRN ¹	Apr-Jul	5216	3995	3672	3278	3191	3186	3432	67	40%
DWR	Apr-Jul	3090	2805	2669	2367	2399	2397	2831	114	29%
TDA ¹	Apr-Aug	91310	88817	86386	86007	83250	88101	98148	110	54%

Notes:

1. Official water supply forecasts for SKQ, ALF, GCL, BRN and TDA are the ESP 10-day-QPF median values published by the NWRFC on the following days for 2022: Jan 5, Feb 3, Mar 3, Apr 5, May 4, Jun 3.
2. Residual runoff (%) is the percentage of the current month's seasonal volume forecast that has yet to runoff during the forecast period. For example, 62% of the forecasted April through August runoff volume for Libby has yet to runoff. Because of the amount of precipitation not included in the official June forecasts, the residuals are calculated based on daily forecasts.

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