Flood Risk Management Requirements
Report #7 for Water Year 2021
Issue Date: 07 June 2021

NOTE: DUE TO DIMINISHED SNOWPACK AND NEAR COMPLETION OF REFILL AT MOST PROJECTS, THIS IS THE FINAL ISSUE OF THE FLOOD RISK MANAGEMENT OPERATING REQUIREMENTS DOCUMENT OF WATER YEAR 2021

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.
No deviations currently in place.

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 2021 official forecast is 72,754 kaf. All other forecasts can be found in Table 2.

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.

D. System Flood Risk Management Refill Requirement Discussion.
The ICF date was declared as May 11, with an ICF of 260 kcfs. The ICF flow rate was based on the official May 2021 seasonal runoff volume forecast. Based upon refill modeling of the most recent ESP traces and the projected decline in runoff, **all project specific flood risk management requirements are removed and all projects are free to refill in a reasonable manner.**

E. Individual Project Flood Risk Management Requirements Discussion.
No specific individual requirements at this time.

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]	1662	2810	4080	3831	3831	6 May	1804	210	0
ARDB (ft)	1430.5	1422.9	1414.1	1416.1	1416.1	9 May	1426	1443.0	1444.0
DCDB (ft)[5]	1839.3	1812.5[5]	1807.7[5]	1807.7	1807.7	1 May	1834.5	1877.3	1892.0
LIB (ft)[4]	2408.1	2406.2	2401.0	2410.7	2409.9	1 May	n/a	n/a	2459.0
LIB (kcfs)	n/a	n/a	n/a	n/a	n/a	1 May	~5	~7	n/a
HGH (ft)	3543.9	3543.8	3534.1	3541.9	3540.9	1 May	n/a	n/a	3560.0
HGH (kcfs)	n/a	n/a	n/a	n/a	n/a	1 May	~6	~6	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	1280.1	1274.7	1272.8	10 May	1282	1290.0	1290.0
BRN (ft)	2077.0	2055.7	2056.7	2072.3	2074.1	10 May	2077.0	2077.0	2077.0
DWR (ft)[6]	1533.0	1536.2	1516.0	1533.8	1533.8	10 May	1594	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.
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. Under certain circumstances, the Flood Control Refill Curve procedure may be used to determine when refill is to begin at each project.

Table 2. Water Supply Forecasts (Kaf)

Project	Forecast Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Current month Forecast % of Normal	Residual Runoff[2] (%)
MCDB	Apr-Aug	11920	11670	12116	11794	10782	11208		102	72%
ARDB	Apr-Aug	23266	22959	23544	23107	21691	21629		98	67%
DCDB	Apr-Aug	2170	2098	2186	2172	2025	2044		102	65%
LIB	Apr-Aug	6215	5979	5980	5549	5191	5006		85	52%
HGH	May-Sep	1820	1670	1805	1626	1600	1640		97	38%
SKQ[1]	Apr-Jul	5632	5499	5197	4676	4702	4909		85	36%
ALF[1]	Apr-Jul	10919	11323	11022	10025	9766	9902		84	34%
GCL[1]	Apr-Aug	55490	57326	55403	53855	50446	50301		89	52%
BRN[1]	Apr-Jul	4202	3959	4204	3453	3007	3003		55	36%
DWR	Apr-Jul	2843	2432	2855	2716	2149	1875		78	17%
TDA[1]	Apr-Aug	82416	83271	82215	78733	74529	72754		83	47%

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 2021: Jan 6, Feb 3, Mar 3, Apr 5, May 5, Jun 3.
2. Residual runoff values are applicable starting in April. Residual runoff (%) is the percentage of the current month's seasonal volume forecast that has yet to runoff during the forecast period. For example, 52% of the forecasted April through August runoff volume for Libby has yet to runoff.

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William Proctor, P.E.
Ch., Hydrologic Engineering and Power Branch