Flood Risk Management Requirements
Northwestern Division
U.S. Army Corps of Engineers
Report #13 for Water Year 2018
Issue Date: 06 JUNE 2018

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 2018

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 the U.S. Army Corps of Engineers, the U.S. 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 Division (CBWM) per the U.S. Army Corps of Engineers 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.

B. List of Approved Flood Deviations from Water Control Manuals.
There are currently no deviations in place.

C. Flood Risk Management Requirements
Table 1 shows the flood risk management elevations, draft and flow limits for the evacuation, holding, and refill periods. The April-August volume forecast at The Dalles Dam based on the June 2018 official forecast is 105,908 kaf. All other water supply forecasts can be found in Table 2.

D. System Flood Risk Management Refill Requirement Discussion.
The Initial Control Flow (ICF) date was declared as May 6, 2018. Based upon refill modeling of the most recent ESP traces and the projected rapid 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.
There are no project specific flood risk management requirements in place.

Table 1. Flood Risk Management Requirements

Project	31Jan	28Feb	31Mar	15 Apr	30 Apr	Date Refill Starts	31 May[3]	30Jun[3]	31 Jul[3]
MCDB (kaf) [2]	1662	2810.0	3267.0	4080.0	4080.0	01 May	2448	286	0.0
ARDB (ft)	1430.5	1422.9	1408.5	1414.1	1414.1	04 May	1436	1442[7]	1444.0
DCDB (ft)	1839.5	1812.5	1807.7	1807.7	1807.7	26 Apr	1845	1892	1892.0
LIB (ft) [4]	2401.8	2387.7	2358.3	2359.3	2362.4[4]	26 Apr	Est	Est	2459.0
LIB (cfs)	n/a	n/a	n/a	n/a	9.2	26 Apr	~9.2	n/a	n/a
HGH (ft)	3541.5	3529.6	3496.2	3476.6	3475.4	01 May	n/a	3560	3560.0
HGH (cfs)[6]	-	-	-	-	-	01 May	~4.2	n/a	n/a
SKQ (ft)[5]	n/a	n/a	n/a	2883.0	n/a	-	2890	2893	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	1289.6	1256.9	1234.0	1222.7	05 May	1268	1290	1290.0
BRN (ft)	2077.0	2046.8	2037.2	2025.0	2030.0	05 May	2069	2077	2077.0
DWR (ft)	1530.5	1516.5	1461.6	1470.0	1500.0[6]	05 May	1583	1600	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. Sə̀liš Ksanka Qĺispə̀ Dam, formerly known as Kerr Dam.
6. Hungry Horse VARQ procedures do not specify end of month targets after the start of refill (after May 1 or 10 days before the ICF date). The VARQ flows are meant as a guide for refill and are not to be interpreted as a strict minimum flow.
7. Arrow is operating to local FRM requirements for the end of June.

Table 2. Water Supply Forecasts (Kaf)

Project	Forecast Period	Jan	Feb	Mar	Apr	May	Jun	Current Month Forecast % of Normal	Residual Runoff[2] (%)
MCDB	Apr-Aug	11117	11334	11753	11727	11406	11861	108	65
ARDB	Apr-Aug	21606	22445	23532	23310	23172	24147	110	60
DCDB	Apr-Aug	1995	2061	2174	2208	2167	2188	109	57
LIB	Apr-Aug	6645	6765	7205	7189	7356	7213	123	47
HGH	May-Sep	1964	2062	2302	2395	2500	2538	150	32
SKQ[1]	Apr-Jul	5595	7346	7573	8241	8274	7911	136	28
ALF[1]	Apr-Jul	12382	15152	15578	17016	17558	16976	144	28
GCL[1]	Apr-Aug	55852	64817	65870	68335	71449	69088	122	42
BRN[1]	Apr-Jul	5690	5509	5665	6436	5889	6156	112	32
DWR	Apr-Jul	2941	2849	3093	3040	3032	2966	123	18
LWG[1]	Apr-Aug	21708	22241	22871	24658	24298	25112	119	30
TDA[1]	Apr-Aug	87282	94748	98132	103337	106883	105908	121	38

Notes:

1. Official water supply forecasts for SKQ, ALF, GCL, BRN and TDA are the ESP 5-day-QPF median values published by the NWRFC on the following days for 2018: Jan 4, Feb 5, Mar 5, Apr 5, May 3, Jun 5, and Jul 6.
2. Residual runoff is the percentage of the current month's seasonal volume forecast that has yet to runoff.

PROCTOR.WILLIAM.DALE.1387297118

Digitally signed by PROCTOR.WILLIAM.DALE.1387297118
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=PROCTOR.WILLIAM.DALE.1387297118
Date: 2018.06.11 11:05:45 -07'00'

William Proctor, P.E.
Ch., Hydrologic Engineering and Power Branch
Northwestern Division, U.S. Army Corps of Engineers