

EXHIBIT F

**DROUGHT CONTINGENCY PLAN
(SEPTEMBER 1985)**

Gathright Dam and Lake Moomaw

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DROUGHT CONTINGENCY PLAN

FOR

GATHRIGHT DAM AND LAKE MOOMAW

I. PROJECT AUTHORIZATION: The preparation of this Drought Contingency Plan is in accordance with the guidance furnished in EM 1110-2-1941 dated 15 September 1981. Refer to Chapter III, Section 3-01 of the main report for the Gathright construction authority.

II. SUMMARY OF EXISTING WATER CONTROL PLAN: See Chapter VII, of the main report.

III. PROJECT FLEXIBILITY WITHIN EXISTING AUTHORITY:

1. Regulation Flexibility - The design of the intake tower and emergency spillway allows for a controlled release ranging from the minimum of record to the most severe flood situation. The low type releases, which are of primary concern in this analysis, can and will be made at several different reservoir levels. Plate 2-10 of the main report denotes reservoir withdrawal levels. The current regulation plan requires the release of monthly flows as stated in Chapter VII, Section 7-08. Inflows greater than the amount are currently used to replace conservation storage up to elevation 1582 NGVD29. Deviation from this schedule will come from the direction provided by the District Commander.
2. Storage Use Flexibility - Available pertinent storage is described by Table F-1.
3. The 60,700 acre-foot of conservation storage between elevations 1582 and 1554 is the quantity established by the U.S. Public Health Service to provide quality flows at Covington with a reliability of 99.6 percent, i.e. one month failure every 20 years on an average. The current regulation plan, which complies with this criteria, stipulates that inflow will be released once the reservoir reaches the minimum conservation pool of 1554. However, it is not the intent of the current operation to preclude the use of storage elevation 1554 if conditions warrant. If such operation is a part of the general parameters of authorized project purposes, does not adversely with authorized project purposes and is otherwise in the public interest, consideration will be given to encroachment on previously allocated storage. For example, during a recurrence of the 1930-31 drought, minimum flows could be provided with an additional 3 feet of drawdown. Flows

Table F-1. IDENTIFICATION OF RESERVOIR STORAGE

Type	Elevation Ft., NGVD29	Storage	
		Watershed Inches	Acre-feet
Flood Control:			
Spillway crest to top of dam	1667.5 to 1684.5	-	81,100
Full flood control pool to spillway crest	1610 to 1667.5	11.8	217,900
Maximum conservation pool to full flood control pool	1582 to 1610	4.3	79,900
Conservation:			
Minimum conservation pool to maximum conservation pool	1554 to 1582	3.3	60,700
Inactive:			
Tunnel invert to minimum conservation pool	1430.5 to 1554	3.4	63,000

following this drought were such that an additional drawdown of about 4 feet could have been refilled by the summer of 1931. Since average spring flows could refill significantly larger volumes, it is not believed an additional drawdown of 5 feet below minimum conservation pool during unusual drought conditions would have serious adverse effects upon recreational activities. An additional 5-foot drawdown would permit minimum releases during droughts somewhat more severe than the drought of record. There may also be conditions which would warrant even greater use of the inactive storage.

4. Other Pertinent Information:

- a. An additional objective of regulation, although not a Congressionally-authorized purpose, is the creation of a habitat downstream suitable for maintaining a trout fishery. The quantity and quality of water to provide a habitat suitable for trout downstream from the dam were estimated by the U.S. Fish and Wildlife Service. This mitigation aspect has not yet been established, but it should be considered during any future regulation modifications. Chapter VII, Section 7-11 provides additional details.
- b. Period of record low flows along the Jackson and James Rivers noted in Table F-2 are provided to assist in determining the seriousness of a particular drought period.

Table F-2. JACKSON AND JAMES RIVER LOW FLOW DATA (a)

Station	Period of Record	10 Year Flow Frequencies In C.F.S. For:		
		7 Day	30 Day	60 Day
Jackson R. Below Gathright Dam nr. Hot Springs, VA	1974-80	64	69	72
Jackson R. at Falling Spring, VA	1925-80	64	70	73
Jackson R. below Dunlap Ck. at Covington, VA	1975-80	92	93	99
James R. at Lick Run, VA	1925-80	184	201	214
James R. at Buchanan, VA	1911-80	272	302	326
James R. at Holcombs Rock, VA	1927-80	400	456	497
James R. at Bent Ck, VA	1925-80	449	544	598
James R. at Scottsville, VA	1925-80	510	614	675
James R. at Cartersville, VA	1925-80	587	735	823
James R. at Richmond, VA	1937-80	719	893	1034

(a) Information had not been influenced by Gathright release.

5. Identified Coordination Interests: There are several potable water withdrawals along the Jackson and James Rivers. This information, which is presented in Table F-3, will be used in the assessment of needs during drought periods.

TABLE F-3. POTABLE WATER WITHDRAWAL SYSTEMS
WITHIN THE JAMES RIVER BASIN

Point of Withdrawal	Capacity		USE, MGD (CFS)	
	MGD	(CFS)	Average	Peak
Covington (b)	4.5	(7.0)	2.5 (3.9)	3.0 (4.6)
Lynchburg (a)	15.0	(23.2)	12.0 (18.6)	16.5 (25.5)
Bremo Bluff	0.14	(0.22)	0.1 (0.15)	0.12 (0.19)
Henrico County	20.0 (c)	(31.0)	9.8 (15.2)	16.0 (24.8)
Richmond (b)	84.0	(130.0)	52.0 (80.5)	66.0 (102.2)

- (a) Lynchburg depends on the James as a backup system. Quantities shown are provided from other systems when available which is most of the time.
 (b) Time of travel of low flow releases from Gathright are on the order of 8 hours and 8 days to Covington and Richmond, respectively.
 (c) Estimated.

6. In order to assure that water control activities which are being instituted are not being duplicated and are complementary to other ongoing efforts, the following are additional interests which must be included in the coordination effort:

- a. Federal:
 - 1. North Atlantic Division.
 - 2. District Emergency Operation Manager.
 - 3. U.S. Forest Service.
 - 4. National Weather Service.
 - 5. U.S. Health Department.
 - 6. Environmental Protection Agency.
 - 7. U. S. Geological Survey.
- b. State:
 - 1. Virginia State Water Control Board (SWCB).
 - 2. Virginia State Emergency Operations Manager.
 - 3. Virginia State Department of Health.
 - 4. Virginia Institute of Marine Science (VIMS).
 - 5. State Legislative Representatives.

c. Local:

1. Pertinent James River Basin counties and cities/towns.
7. The foregoing interests should provide a good foundation from which to work. It is fully expected that as a result of making these contacts, other interests which have not been identified will also surface. The District is now in the process of identifying key persons with each organization, including their titles, addresses, and telephone numbers. This information will be displayed when it becomes available. Until this occurs, the Engineering and Construction Division will continue to make its contacts through the management level.
8. Criteria for Initiation of Drought Contingency plan Coordination - Prior to the initiation of any coordination, several items must be identified by the potential water users. These items include the following:
- a. Identification of area(s) making request - Proper name of locality, coordinates, address, and telephone number of responsible person(s).
 - b. Identification of existing problem. Describe current use of water and define volumes. Provide social and economic impacts if existing situation continues or becomes worse.
 - c. Define the need in terms of quality, quantity and timing.
 - d. Provide main stem withdrawal capabilities, off-stream storage and locations of each.
9. This information must be provided along with a formal request for assistance to the SWCB. It will be within its authority to decide on the validity of the request.
10. Coordination requirements for Drought Contingency Plan - The Commander, Norfolk District, will receive requests via the SWCB. An independent review will be made and provided by the Engineering and Construction Division staff. Since every situation could be different, particularly with regard to the many parameters and authorized purposes that are involved, each request will have to be taken on a case-by-case basis. The coordination efforts by the Engineering and Construction Division will involve those interests needed to establish the impacts for both a with and without approval situation. The ultimate responsibility in the decision making process will rest with the District Commander.

11. Drought Contingency Plan - The Norfolk District has re-examined its regulation procedures and finds no justification for identifying a specific increment of storage for use during droughts. However, the additional drawdown that would be required to maintain normal releases during conditions similar to the drought of record has been identified.

12. Temporary allocation of water will have to be evaluated independently using reasoning previously described. Any permanent allocation is considered beyond the existing authority and cannot be addressed in this document.