Lake Red Rock Regulation Manual
Modification to Regulations

Regulation of Lake Red Rock in conjunction with Saylorville Lake provides flood risk management benefits along both the Des Moines and Mississippi Rivers. Additionally, a permanent conservation pool provides storage for low flow augmentation, fish and wildlife management, and a multitude of recreational opportunities. A final objective provides for a drought contingency regulation which effectively rations water during extended drought periods.

In 1944, Congress enacted Public Law 78-534, 78th Congress, second session, which authorized the Red Rock Dam substantially in accordance with the recommendations of the Chief of Engineers in House Document No. 651, 78th Congress, second session. The House Document (Para. 61) contemplated a multi-purpose reservoir having 1,200,000 acre-feet of storage divided as follows:

800,000 acre-feet	Flood Control
400,000 acre-feet	Power, Recreation, Conservation, Related Uses

In 1958, prior to the construction of Lake Red Rock, Congress authorized the construction of Saylorville Lake, substantially in accordance with the recommendations of the Chief of Engineers in Senate Document No.9, 85th Congress, first session (Section 203, Public Law 85-500, 85th Congress, second session). The authority for the review report contained in Senate Document No. 9 required complete investigation and analysis of the flood problems in the Des Moines River basin. Projects authorized, but not built, were wholly or partially re-examined to ascertain whether inclusion of these projects in the overall plan furnished the best solution.

During the review of the *Definite Project Report, Red Rock Reservoir Howell Site, Des Moines River, Iowa,* 19 *November 1948,* the Iowa Conservation Commission (ICC) requested allocation of 50,000 acre-feet of storage for conservation. This storage would provide 300 cfs minimum releases to maintain desirable water quality and supply at the Ottumwa, Iowa gage. In Senate Document No.9, this conservation storage was shifted from Lake Red Rock to Saylorville Lake and increased from 50,000 to 75,000 acre feet.

As a result of this shift, minimum low flows are maintained at both Des Moines (200 cfs) and Ottumwa (300 cfs). The primary reason for the shift was the high sedimentation rates anticipated for Lake Red Rock with a large permanent pool. With the shift, the Lake Red Rock conservation pool was reduced to 3,300 acre feet (750 surface acres) or a conservation pool of 704.0 feet NGVD.

With a permanent pool of 50,000 acre-feet, (elevation 720.0) Lake Red Rock was estimated to lose about 10 percent (180,000 acre feet) of its total capacity within a 50-year period. By operating with the smaller permanent pool, only 5 percent (90,000 acre-feet) of the total capacity would be lost, or a savings of approximately 90,000 acre-feet within the same 50-year period.

During construction of Lake Red Rock, the Corps of Engineers prepared *Design Memorandum No. 3, Supplement* 1, 13 *October 1961.* This design memorandum studied the need for conservation storage at Lake Red Rock in order to meet the low flows desired by the Iowa Natural Resources Council (includes the ICC). The Council was anxious to have the storage available in case of drought. The Council stated that 200 cfs at Des Moines and 300 cfs at Ottumwa were considered the absolute minimum flows. Studies by the Council indicated that the proposed 75,000 acre-feet of conservation storage at Saylorville Lake, combined with the proposed 3,300 acre-feet at Lake Red Rock, would not provide the minimum flows identified by the Council and required by the Senate Document.

The Council and the Corps of Engineers advocated establishment of a conservation pool with 50,000 acre-feet of storage for low flows at Lake Red Rock. A conservation pool elevation of 725 feet NGVD would provide approximately 90,000 acre-feet for conservation and sediment storage and would enable operation of the two reservoirs to achieve the desired low flows at Des Moines and Ottumwa. The design memorandum stated that a pool at elevation 725 feet NGVD would not appreciably encroach upon the flood storage capacity of Lake Red Rock.

It was recognized that sedimentation would fill in the conservation pool over time. The Council recommended that the pool be raised periodically to maintain the 50,000 acre-feet of conservation storage over the sediment. The Corps of Engineers decided to defer a recommendation on the problem until the need to raise the pool again presented itself.

The Chief of Engineers approved establishment of a conservation pool at elevation 725 feet NGVD on April 30, 1962. The Office of the Chief of Engineers (OCE) determined that a conservation pool could be accommodated within the requirements for a sedimentation reserve under existing authority. Although Senate Document No. 9 acknowledged that substantial sedimentation would occur at Lake Red Rock, specific sedimentation reserve was not provided.

During the drought of 1976-77, the flows on the Des Moines River system fell to levels which required a request to the Rock Island District's headquarters, the North Central Division (NCD), to reduce the minimum low flow release to lower than the 300 cfs minimum guaranteed release rate. The rate was reduced to 200 cfs on 17 June 1977 and was held at this outflow rate until 26 August 1977 when above normal rainfall increased the inflow into the reservoir so that normal outflows could be resumed.

On August 26, 1977, the Corps of Engineers temporarily raised the pool level at Lake Red Rock from elevation 725 feet to elevation 728 feet NGVD to regain the 90,000 acre-feet of conservation storage pending completion of the required environmental and water quality studies. This raise was prompted by the drought of 1977 and the loss of adequate storage for low-flow releases due to sedimentation. Corps of Engineers studies indicated that the raise from elevation 725 feet to elevation 728 feet NGVD would not have an adverse effect on flood control operation. In addition, the Corps of Engineers completed the required environmental assessment and Finding of No Significant Impact. The conservation pool raise was approved on August 17, 1979. An overview of regulation changes that have been made are contained in table 3-1.

Table 3-1 Summary of Modifications to Regulation

Year	Modification
1979	Pool raise from 725 to 728 feet NGVD
1982	Flash flood operation implemented
1988	Pool raise from 728 to 734 feet NGVD; Maximum growing season release increased to 22,000 cfs when pool exceeds 760 feet NGVD; Start of growing season changed from 21 April to 1 May
1992	Pool raise from 734 to 742 feet NGVD

Following the 1979 pool raise, the Corps of Engineers began investigations to further refine sedimentation rate estimates and to develop a plan for dealing with the sediment accumulation. The 1985-86 survey by the Corps of Engineers indicated an average annual sedimentation rate in the conservation pool of 3,500 acre feet per year over the 100-year project life, or a total of 350,000 acre-feet. This represents approximately 20 percent of the initial flood control storage capacity of Lake Red Rock. With the 50,000 acre-feet needed to ensure low flows of 300 cfs at Ottumwa, the combined storage of 400,000 acre-feet would require a 100-year conservation pool level of 742 feet NGVD.

In July 1982, rainfalls in the vicinity of Red Rock Dam were between the 100-year and 200-year return events. These large inflows to the lake were concurrent with high flows on the uncontrolled tributaries below Red Rock Dam. An emergency request was made to NCD to reduce the outflow rate to 500 cfs, thereby lowering the flow levels downstream. This procedure was then adopted into the regulation schedule.

As a result of ongoing reservoir sedimentation and public request, the conservation pool was raised to elevation 734 feet NGVD on October 28, 1988. The raise to 734 was made with the understanding that a future raise to elevation 742 feet NGVD would be necessary. Prior to the signing of the Record of Decision, the Chief of Engineers requested the Rock Island District analyze the effect of a 742 conservation pool. Operation changes were made to compensate for the loss of flood control storage. Upon completion of the Environmental Impact Statement and at the urging of Iowa Governor Branstad, it was decided to enact an immediate raise to elevation 742 feet NGVD. The pool raise was completed in February 1992.

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