

# STATE WATER RESOURCES CONTROL BOARD

## DIVISION OF WATER RIGHTS

### CONSIDERATIONS FOR RESERVOIR LICENSING

Water in a reservoir may be considered either stored water, water that has been regulated, or water that is diverted by direct diversion. For the purposes of water right licensing, the definitions of when water is considered to have been stored versus regulated are set forth in California Code of Regulations, title 23, sections 657 and 658.

#### Regulation of Water

California Code of Regulations, title 23, section 657 states:

*Regulation of water means the direct diversion of water to a tank or reservoir in order that the water may be held for use at a rate other than the rate at which it may be conveniently diverted from its source. For licensing purposes, refill, in whole or in part, held in a tank or reservoir for less than 30 days shall be considered regulation of water.*

Regulation of water as stated above is considered direct diversion, not storage. This only applies to refill, not to initial storage. Initial storage can be withdrawn for use without regard to any specified time limit.

#### Storage of Water

California Code of Regulations, title 23, section 658 states:

*Storage of water means the collection of water in a tank or reservoir during a time of higher stream flow which is held for use during a time of deficient stream flow. For licensing purposes all initial collections within the collection season plus refill, in whole or in part, held in a tank or reservoir for more than 30 days shall be considered water diverted for storage except as provided in Section 735(c)<sup>2</sup>.*

If inflow is occurring at a reservoir and the water surface is rising, any withdrawal of water from the reservoir is considered direct diversion, not storage. If the total amount of inflow is bypassed through or around the reservoir and if water is taken from the reservoir for beneficial uses such that the water surface is falling, the withdrawal of water is considered withdrawal from storage<sup>3</sup>.

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<sup>2</sup> California Code of Regulations, title 23, section 735, subdivision (c) makes an exception for diversion of water during the spring frost season from March 15 to May 15 in the Napa River Valley.

<sup>3</sup> If the water surface in the reservoir subsequently rises, the 30-day rule determines if withdrawal of the re-storage is direct diversion or storage withdrawal. However, the Division will consider flow "spikes" that encroach into flood space determined by the U.S. Army Corps of Engineers as regulation of water when estimating the flow diverted to storage or withdrawn from storage. Flood space encroachment at the end-of-season may be used if authorized by the U.S. Army Corps of Engineers.

## **LIFO-FILO Methodology**

For licensing purposes, the Division uses a LIFO-FILO methodology for tracking different sources or types of reservoir storage, which was developed by interpreting California Code of Regulations, title 23, sections 657 and 658.

LIFO-FILO refers to “Last-In, First-Out” and “First-In, Last-Out” where the last volume of water that flows into a reservoir is assumed to be the first volume to flow out and, conversely, the first volume of water that flows into a reservoir is assumed to be the last volume to flow out. The LIFO-FILO methodology is used for the following situations: (1) reservoirs that serve as both water storage points and direct diversion points; and, (2) reservoirs from which water is pumped or released and then refilled to any extent by inflow or diversion from other sources. In general, initial pumping, or release, of water after the reservoir has initially filled is considered withdrawal from storage.

Any pumping or release of water from the reservoir within 30 days after the reservoir has been refilled is considered regulatory storage of water until the previous draw-down level is exceeded. Once the previous draw-down level is exceeded, the volume of water pumped, or released, beyond this level is withdrawal from initial storage.

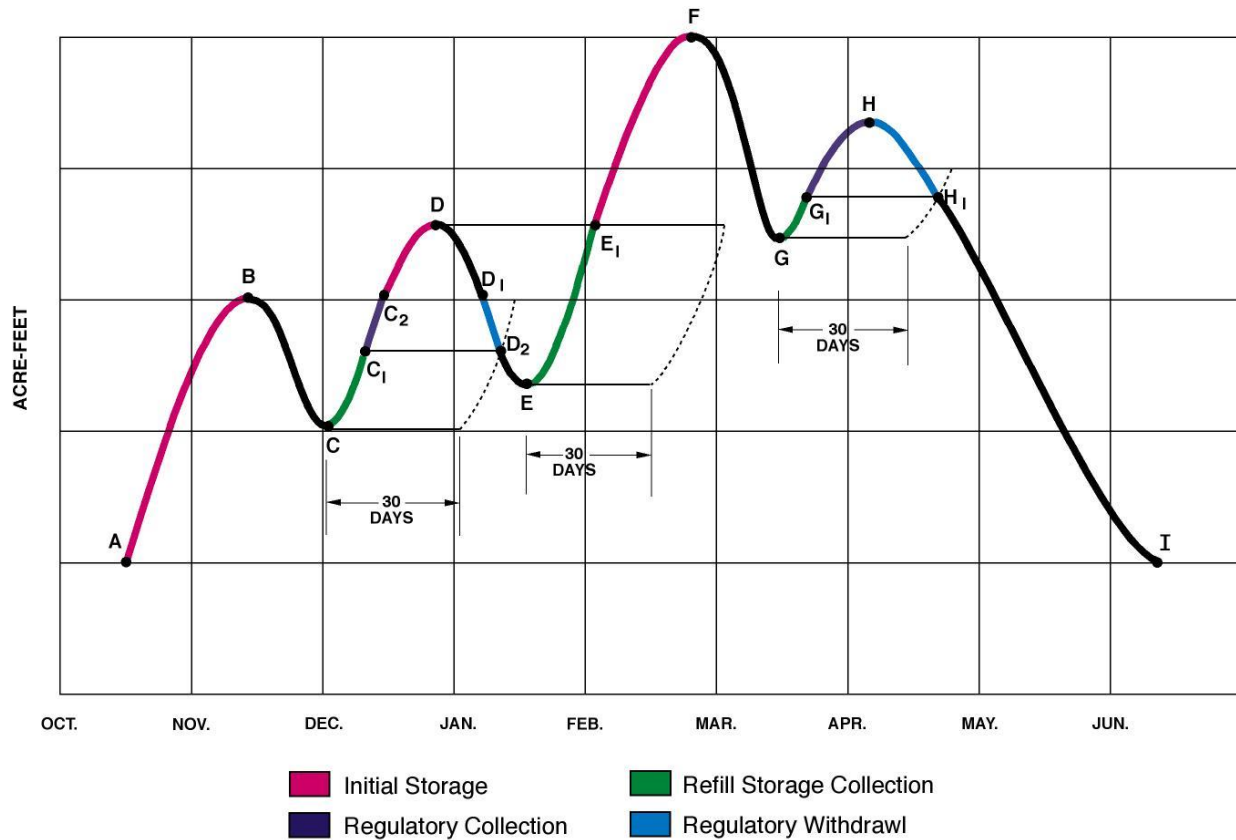
Long-term carryover reservoirs are usually sized to collect water in years of heavy runoff for use over several consecutive dry years. In such cases, the Division recognizes the maximum collection year, whenever it occurs for licensing. A license for a water storage project is segregated into two components.

Water that is held in a reservoir for over 30 days is considered storage, and a license is written in terms of acre-feet per annum collected and later put to beneficial use.

Water diverted by direct diversion or regulatory storage of less than 30 days is regarded as direct diversion, and the license is issued in terms of some unit of flow, such as cubic feet per second.

Please refer to the attached explanatory sample hydrograph and two example hydrographs for more information.

# SAMPLE HYDROGRAPH

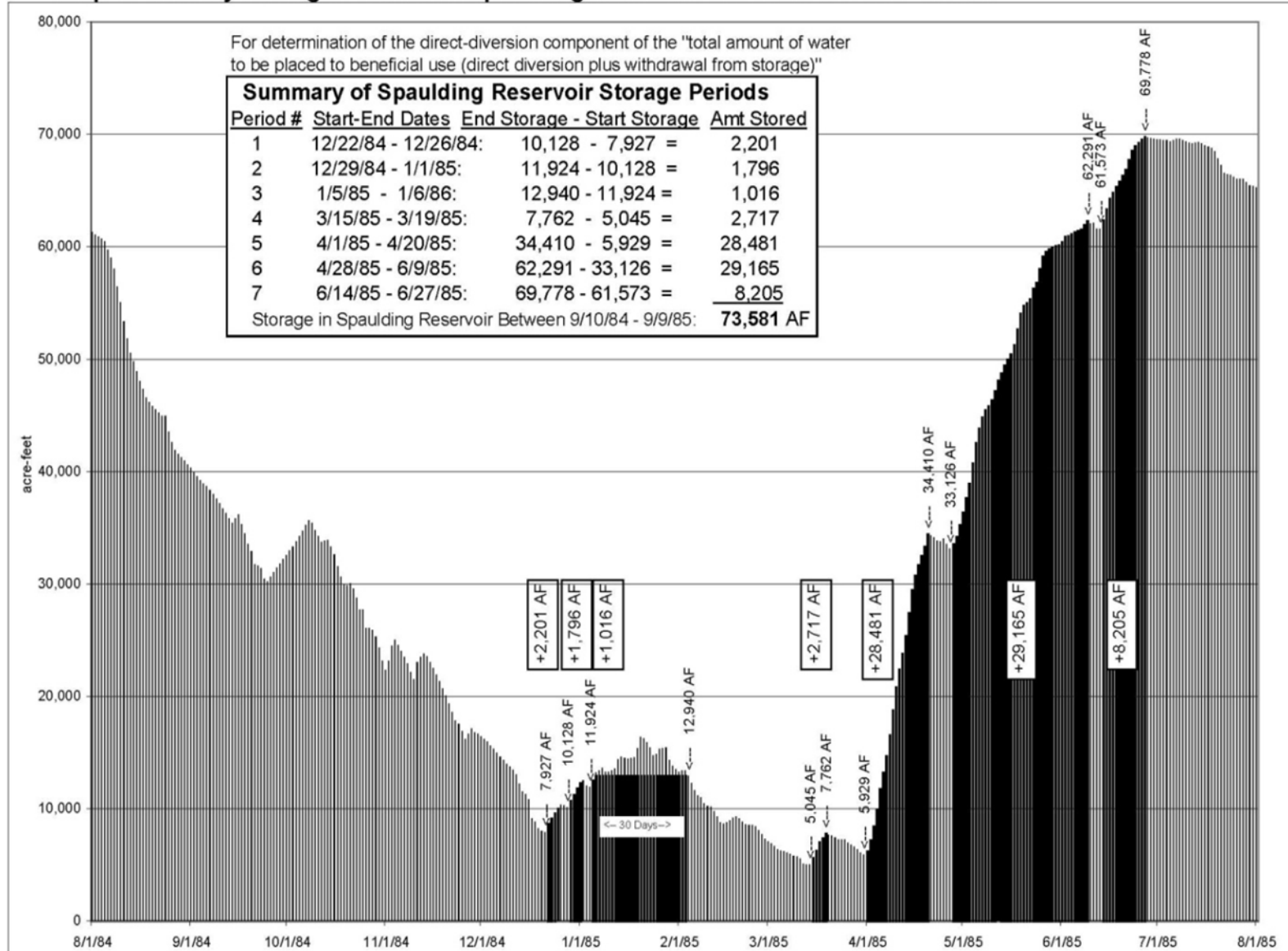


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1. **A-B**, **C2-D** and **E1-F** constitute initial collection to storage.
2. Refill of initial storage C-C2, **E-E1** and G-H must be analyzed to determine if all or part of refills were released within 30 days.
  - a. Withdrawal **D1-D2** occurred within 30 days, therefore **C1-C2** is considered regulatory. **C-C1** is determined to be collection to storage.
  - b. Analyzing **E-E1** results in no withdrawal of this water within a 30-day period. Therefore **E-E1** is considered collection to storage.
  - c. On analyzing G-H, it is determined that **G-G1** is held for 30 days or more and therefore is considered collection to storage. **H-H1** was withdrawn within a 30-day period. Therefore **G1-H** is considered regulatory storage.
3. The total storage is comprised of **A-B**, **C-C1**, **C2-D**, **E-E1**, **E1-F** and **G-G1**.

Since **C1-C2** (**D1-D2**) and **G1-H** (**H-H1**) are considered regulatory, the total withdrawal from storage is comprised of **B-C**, **D-D1**, **D2-E**, **F-G** and **H1-I**.

# Step 1: Identify Storage Periods in Spaulding Reservoir Between 9/10/84 - 9/9/85



Print Legal-Sized

## Bowman Reservoir

USGS Gage # 1145500

Year of Max "Taken from the Source" (Direct Diversion + Storage)

May 22, 1995 - May 21, 1996

### Storage Periods (basis)

5/22/95 - 6/5/95:	9,500 (I.F.)
6/10/95 - 7/7/95:	10,600 (30-d + I.F.)
7/10/95 - 7/27/95:	6,100 (30-d + I.F.)
9/6/95 - 9/29/95:	1,300 (30-d) (all J.M. restrg)
12/11/95 - 12/12/95:	1,700 (30-d)
1/16/96 - 4/8/96:	17,800 (30-d)
4/9/96 - 4/17/96:	1,500 (I.F.)
4/24/96 - 5/16/96:	12,310 (30-d + I.F.)

Total: 60,810 AF

