

ARKANSAS RIVER COMPACT ADMINISTRATION

Lamar, Colorado 81052

For Colorado

Chairman and Federal Representative

For Kansas

James Eklund, Denver

James T. Rizzuto, Swink

David Barfield, Topeka

Lane Malone, Holly

Randy Hayzlett, Lakin

Scott Brazil, Vineland

Hal Scheuerman, Deerfield

December 1, 2016

Mr. Hal Scheuerman, Chairman
Mr. Lane Malone, Member
Operations Committee
Arkansas River Compact Administration

Re: Compact Year 2016 Summary
Assistant Operations Secretary Report

Gentlemen,

In this report, I will provide my perspective as Assistant Operations Secretary on operations that have occurred over the past Compact Year (CY), including communications, Kansas Reservoir Call, the Pueblo Winter Water Storage Program (PWWSP), Pass-thru & Status Accounting, Water Issues Matrix, and Special Engineering Committee.

Communications

The Operations Secretary, Assistant Operations Secretary, and their respective staff have set a goal of open and frequent communications regarding Arkansas River operational issues to foster a positive, collaborative, and productive working relationship. We continue to work on achieving this goal.

In our roles as Operations and Assistant Operation Secretaries', we met twice:

- February 29th met with Operations Committee primarily to review the water issues matrix, and
- November 14th to review operations on the Consolidated Ditch just before the Pueblo Winter Water Storage Program (PWWSP) began and to discuss guidelines related to the split ratio between the Compact Conservation Storage and the PWWSP into John Martin Reservoir (JMR).

We were also involved in meetings between the States related to the ARCA Special Engineering Committee.

Additionally, the States have communicated on a regular basis. These communications included a variety of topics including John Martin Accounting System (JMAS) data updates, PWWSP operational issues, Offset Account operations, Kansas releases, and runoff conditions within the Arkansas River Basin. Issues were generally resolved as they arose.

John Martin Reservoir

I have provided a graphical representation of John Martin Reservoir (JMR) and the accounts contained within for CY2016. See Figure 2 in the attached to the end of this report. The maximum JMR end of day content occurred on March 7th and 8th with 240,342 AF in storage. The minimum JMR end of day content occurred on October 30th with 94,344 AF in storage.

Deliveries to Kansas

Kansas entered the irrigation season with just over 100,000 AF in stored account water in John Martin Reservoir, the bulk of this (83,137 AF) being water carried over from CY2015. During CY2016, Kansas made three (3) account releases that will be described briefly below.

Kansas Release 1: A 550 cfs release from the Kansas Section II Account was started on July 7th. The release was increased to 750 cfs before being reduced the last several days of this run. This release lasted approximately 23 days. A total of 30,253 AF was released from the Kansas Section II Account. This release was terminated because of precipitation events. The release spreadsheet accounting was exchanged and reviewed by both offices. Corrections to the accounting were made and ultimately a final accounting accepted. The table below provides the basic information on this release. See Figure 3 for a graphic of this release.

Kansas Section II Account (6/07-6/30/2016)	
Kansas Section II Account released	30,253 AF
Transit Account released	1,961 AF
ESF Delivery Efficiency	99.8 %
Section II Delivery	30,181 AF
Section II Delivery Transit Loss	72 AF

The agreed to accounting determined the Stateline delivery to be 30,181 AF or 72 AF less than was released from the Kansas Section II Account. This delivery deficit was not made up during CY2016 as there were no deliveries to Section III Accounts after the deficit was confirmed. The deficit will be made up from the Section III 35% charge in CY2017.

Kansas Release 2: A 550 cfs release from the Kansas Section II Account was started on July 12th. On July 18th, the release was modified so that 500 cfs was released from the Kansas Section II Account and 60 cfs from the Offset Account. While the release was being made, the Offset Account release stayed at 60 cfs, but the Kansas Section II release was reduced to 370 cfs on July 27th due to reduced demand. Additional reductions to the Kansas Section II release rate were made the last few days of the release, with the release terminating due to rain. A total of 23,042 AF was released from the Kansas Section II Account and 2,393 AF from the Offset Account during this 27 day release. The table below provides the basic information on this release. See Figure 4 for a graphic of this release.

Kansas II & Offset Account Release (7/12-8/7/2016)	
Kansas Section II Account release	23,042 AF
ESF Delivery Efficiency	100%
Section II Delivery	23,042 AF
Section II Delivery Transit Loss	0 AF
Offset Account released	
- consumable	1,851 AF
- nonconsumable	524 AF
Offset Account delivery efficiency	78.4%
Offset net delivery	1,862 AF
Offset consumable delivery	1,451 AF

Kansas Release 3: A 110 cfs release from the Offset Account was started on August 17th to support Stateline flows. A total of 3,039 AF was released from the Offset Account for 15 days. The release was terminated due to reduced irrigation demand. The table below provides the basic information on this release. See Figure 5 for a graphic of this release.

Offset Account (8/17-8/31/2016)	
Offset Account released	
- consumable	3,039 AF
- nonconsumable	0 AF
Offset Account delivery efficiency	85.34%
Offset net delivery	2,593 AF
Offset consumable delivery	2,593 AF

Pueblo Winter Water Storage Program

The States have committed to work on this issue and will build upon the work that has already been done. PWWSP issues have held up approval of the Operations Secretary's annual reports since 2006.

Related to current operations, Colorado and Kansas have visited the Consolidated Ditch to review water being returned to either the Purgatoire River above the Purgatoire River near Las

Animas gage or at the tail end of the ditch itself since November 2010. These visits have generally occurred in the days ahead of November 15th which is the beginning of the PWWSP. In November 2015, I did not get the opportunity to visit the Consolidated Ditch. However, Lonnie Spady, Colorado Division 2 staff was able to visit and found that the Consolidated Ditch was using their wasteway to the Purgatoire River and additional water was being passed out the bottom of the ditch system.

I worked with John Van Oort and Phil Reynolds to estimate the baseflow prior to November 15, 2015 for the Arkansas River at Las Animas. As part of this effort, the 15-minute data for Arkansas River at Las Animas gage and Purgatoire River near Las Animas gage was reviewed. Based on that review, it appears that the effect on the Purgatoire River near Las Animas gage flows was 19 cfs for the water being wasted to the Purgatoire River. This 19 cfs was added to the Arkansas River at Las Animas gage flows prior to the reduction of the Consolidated Ditch diversions resulting from Mr. Spady's visit. This did not account for water being wasted out the bottom end of the Consolidated Ditch service area which was estimated by Mr. Spady at 10 cfs.

Figure 1 shows the Arkansas River at Las Animas gage flow, the Compact water stored in John Martin Reservoir, and the Compact ratio from November 1, 2015 thru March 15, 2016. The PWWSP period is from November 15th through March 14th each year.

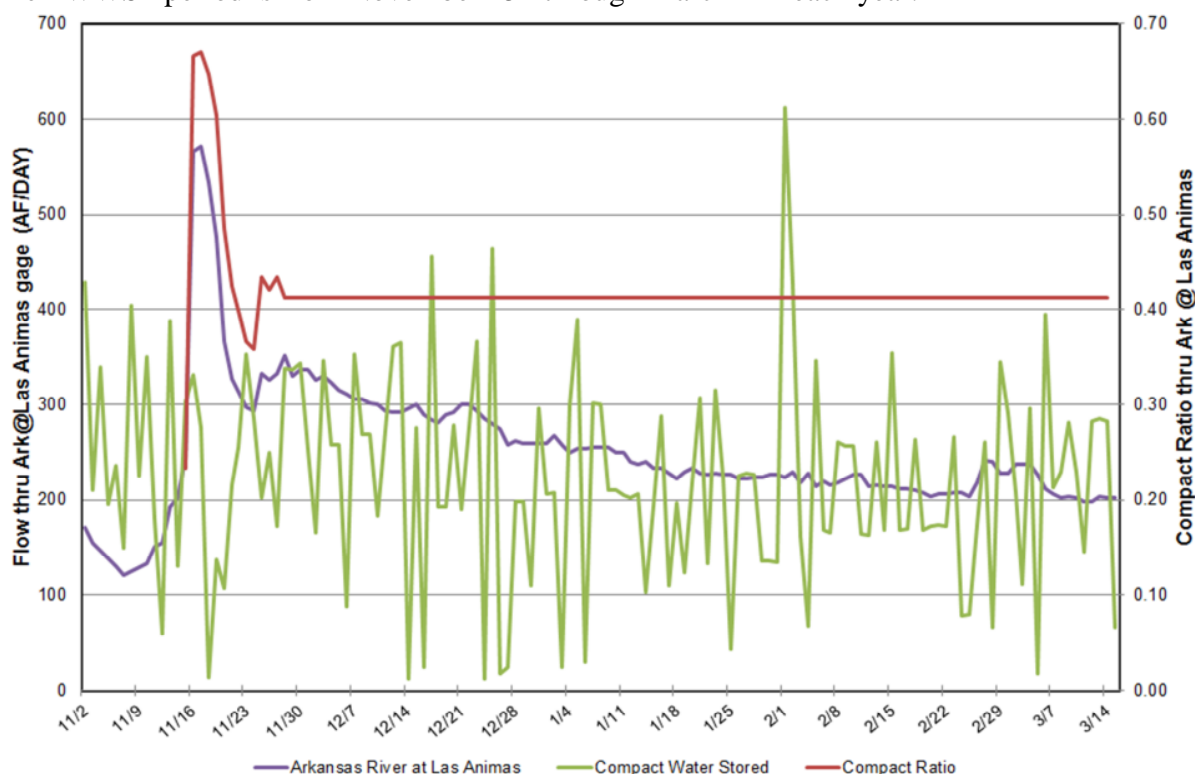


Figure 1 Arkansas River at Las Animas and Compact Conservation storage for the period of November 1, 2015 to March 15, 2016 and the Compact ratio of the Arkansas River at Las Animas flows for the period of November 15, 2015 to March 14, 2016.

CY2017 PWWSP: As noted above, since November 2010, Colorado and Kansas have visited the Consolidated Ditch to review water being returned to either the Purgatoire River above the Purgatoire River near Las Animas gage and at the tail end of the ditch itself. On November 14, 2016, John Van Oort, Bill Tyner, Lonnie Spady with Colorado Division 2 and Brandy Cole, Rachel Duran, and myself visited the two returns just before the syphon under the Purgatoire River, the tail of the Consolidated Ditch, and the seep return. We found that one of the returns was wet but not actively returning water and the second return nearest the syphon had not been recently used based on branches and general condition of the return. The seep return and tail end of the ditch were returning small amounts below the Arkansas River at Las Animas USGS gage.

Pass-thru and Status Accounting

JMR daily inflow, storage, and outflow were tracked by the Garden City Field Office staff for CY2016. A pass thru spreadsheet was first provided to the Operations Secretary on November 11th for inclusion in the Operations Secretary's report. This spreadsheet tracks: the amount (AF) of river flows; JMAS (John Martin Accounting System) inflows & releases; JMR reservoir evaporation, storage, & releases.

The information in this spreadsheet was regularly updated and reviewed by the Garden City Field Office staff. The spreadsheet uses the tracked information to calculate:

- (1) gaged and ungaged inflows,
- (2) pass-thru, and
- (3) the reservoir "status."

The pass-thru represents that amount of JMR inflows which are not stored in any account and are released on downstream. The reservoir "status" represents the difference between the amount considered stored in JMAS and the amount shown as stored in JMR by the Corps.

Water Issues Matrix

As previously reported in the past, this matrix is a joint work product of the States which is designed to track various disputed issues. These disputed issues are primarily concerned with JMR related operations and accounting. Approximately half have been resolved through the efforts of this Committee and others. The matrix currently has 35 issues, of which 12 are pending resolution, four (4) have been removed or suspended, and 19 have been resolved.

The Operations Committee met on February 29th with the Operations and Assistant Operations Secretaries. At this meeting, the Water Issues Matrix was reviewed with the Committee. Since that time, the States have proposed resolutions for two of the matrix issues (Issues 27 and 33) which will be considered by ARCA.

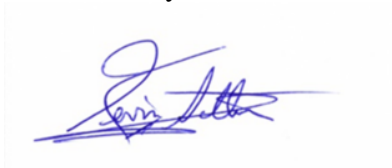
The current versions of the matrix and issues summary table will be provided to the Operations Committee and Operations Secretary before the December 8th committee meeting.

Summary

In CY 2016, the substantial improvement in the availability of surface water supplies over that of previous years was welcome. It is good to see us moving into the CY2017 with some water stored in John Martin Reservoir, especially given the dry start to this storage season.

I look forward to working with the Operations Secretary and his staff on these issues and the day-to-day operations of the Arkansas River.

Sincerely,



Kevin L. Salter, P.E.
Assistant Operations Secretary

Figure 2 Graphical representation of John Martin Accounts over CY2016

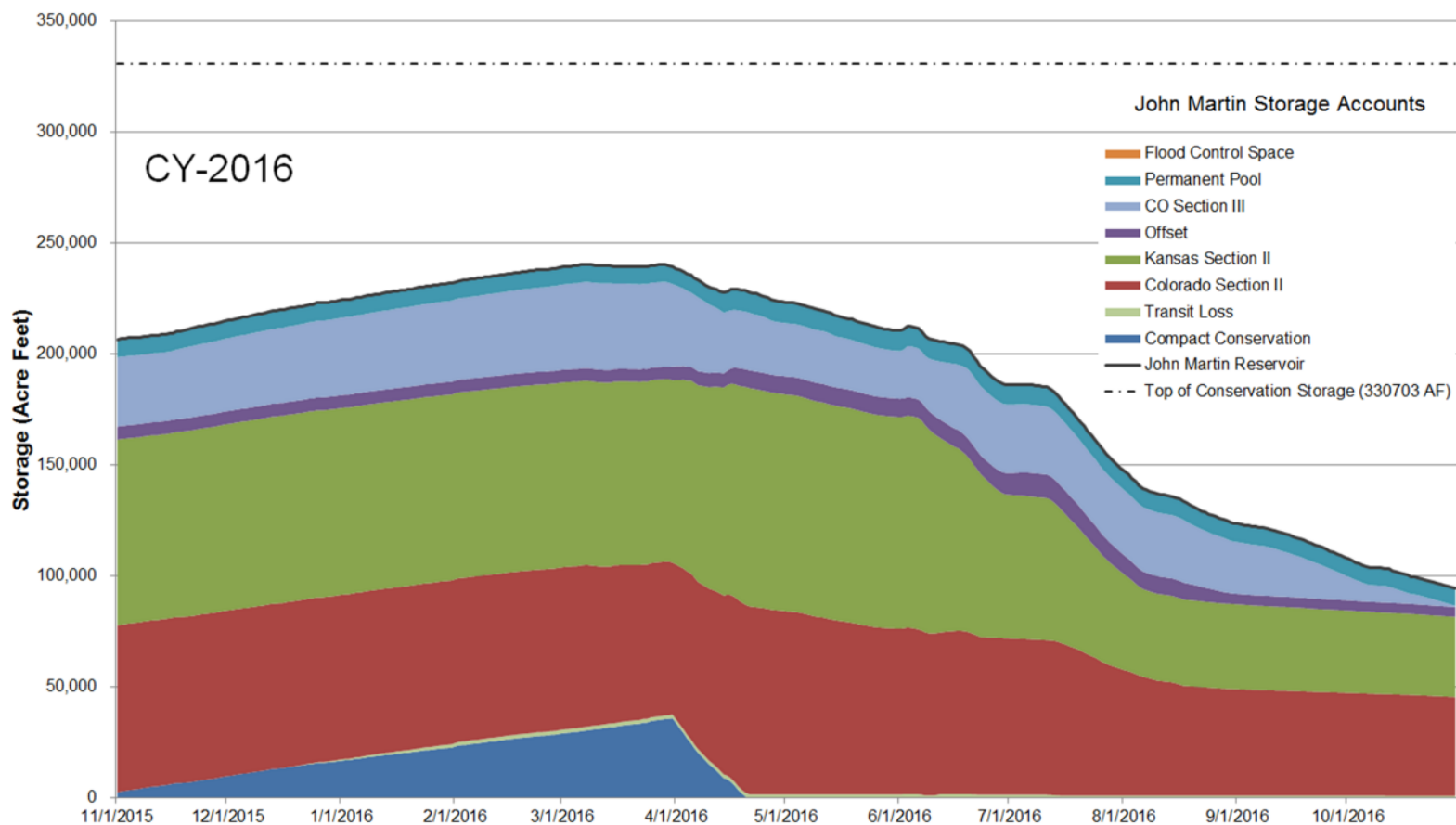


Figure 3 Hydograph of the Kansas 1st release at the Stateline (Section II)

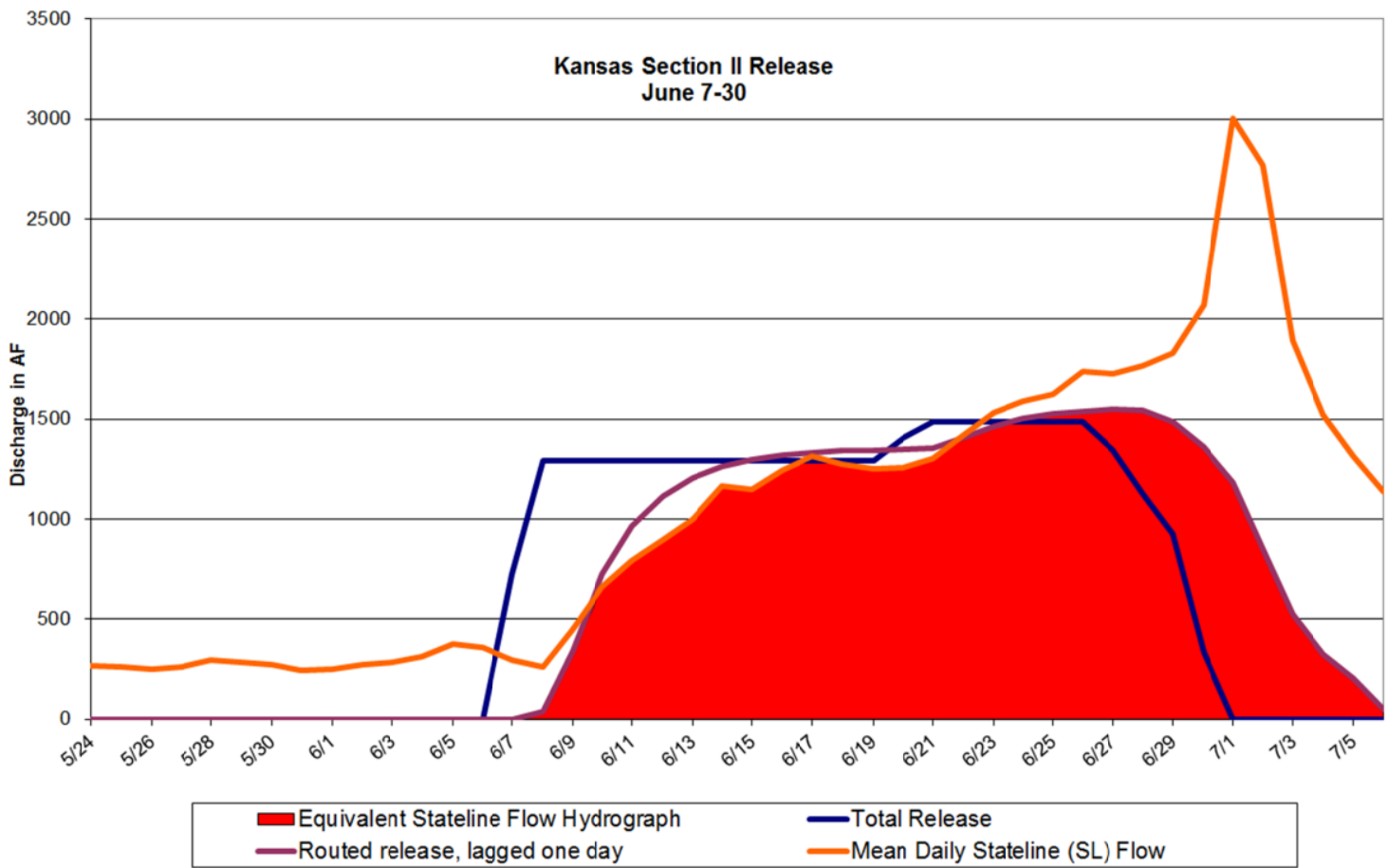


Figure 4 Hydrograph of the Kansas 2nd release at the Stateline (Section II & Offset)

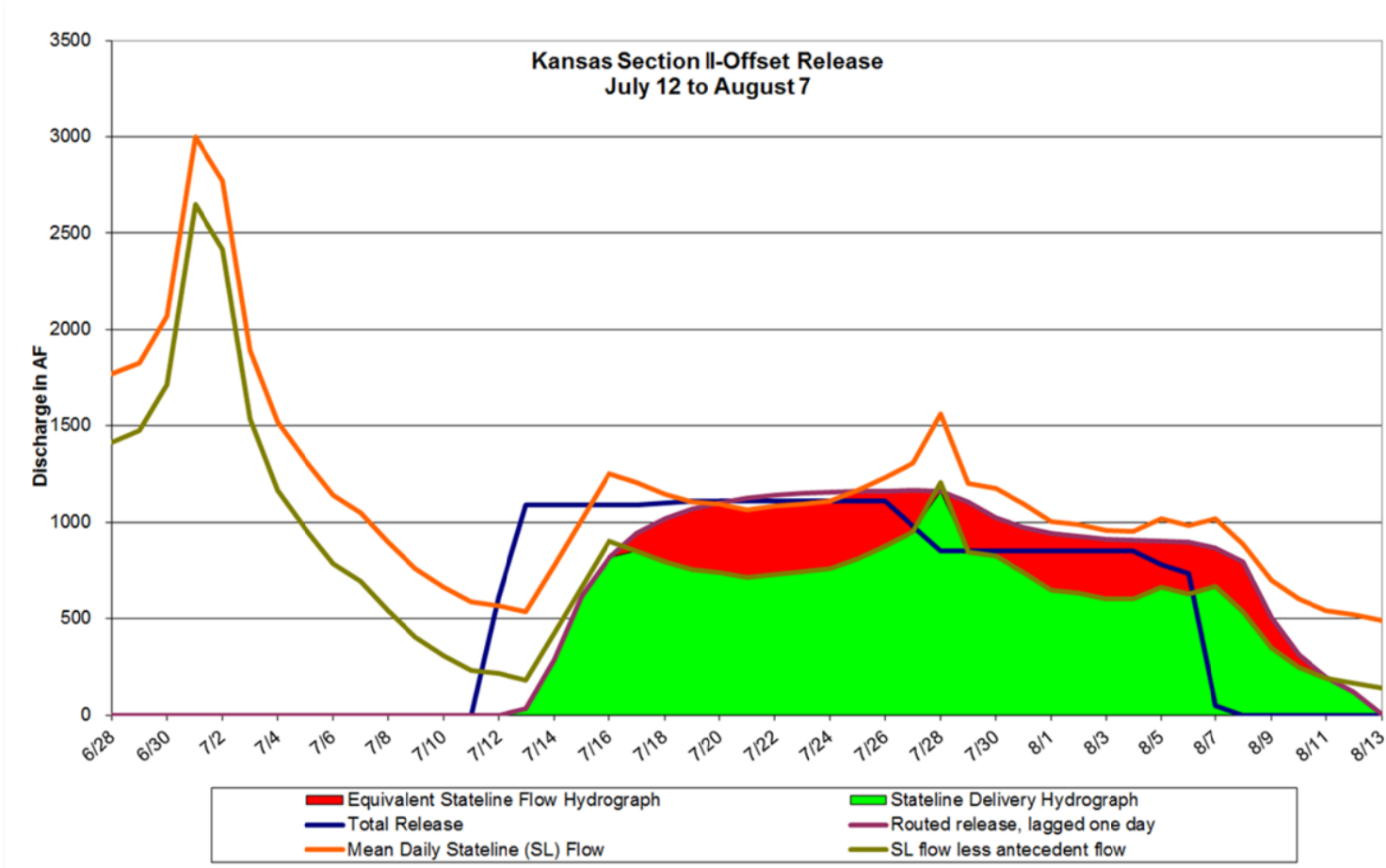


Figure 5 Hydrograph of the Kansas 1st release at the Stateline (Offset)

