
Meeting Date: May 20, 2015
Staff Contact: Andrew Lieuwen, Program Manager

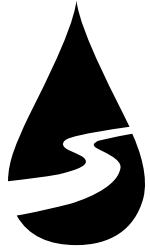
TITLE: OB-15-6 - 2015-16 Annual Operating Plan for the Drinking Water Project

ACTION: Receipt

SUMMARY:

As required by the 2004 Biological Opinion issued by the US Fish and Wildlife Service (FWS), the Water Authority issues an Annual Operating Plan (AOP) for its Drinking Water Project (DWP). This report is submitted to the FWS in May of each year to describe the Water Authority's planned DWP operations from April of the current year to March of the following year (operating year). The goal of the report is to provide the FWS an estimate of the maximum amount of surface water diversions that are planned for the year as the FWS is concerned about water operations that affect endangered species in the Middle Rio Grande (MRG).

If there are issues that arise during the irrigation season that affect the Water Authority or river operations in general, then the FWS along with other parties in the MRG, are informed via the scheduled conference calls that occur during the irrigation season. Any adjustments made to releases or diversions will be coordinated through these ongoing coordination efforts. The conference calls have been a very effective tool in coordinating ongoing efforts in managing the river.



Albuquerque Bernalillo County
Water Utility Authority

**Annual Operating Plan for the Drinking Water Project
Operating Year April 2015 through March 2016
Consultation Number 2-22-03-F0146**

May 2015

Introduction

On February 13, 2004, the United States Department of the Interior, Fish and Wildlife Service (Service) issued a Biological Opinion (BO) on the Effects of Actions Associated with the “Programmatic Biological Assessment (BA) for the City of Albuquerque Drinking Water Project (DWP).” The DWP, a key component of the Water Resource Management Strategy (WRMS), enables the Albuquerque area to shift from sole reliance on groundwater to a blend of groundwater and San Juan-Chama (SJC) surface water diverted from the channel of the Rio Grande. The BO for the DWP committed the City to meet with the Service to discuss their Annual Operating Plan (AOP) for the DWP by May 15 of each year. The AOP is a report describing the planned DWP operations from April of the current year through March of the following year. The April to March time period allows for the incorporation of the annual spring runoff forecasts and associated operating plans for the U.S. Bureau of Reclamation (Reclamation) and US Army Corps of Engineers (COE) reservoirs in which SJC water is stored.

In 2003, the New Mexico Legislature created the Albuquerque Bernalillo County Water Utility Authority (Water Authority). The Water Authority became successor in interest to the City of Albuquerque Water Utility Department, and all assets and administrative and operational functions of the City’s Water Utility Department were transferred to the Water Authority. These transfers included the DWP as well as the obligations associated with the BO. As of December 31, 2014, the DWP has been in operation for six full years, and since 2010, the DWP has provided from 40 to 60 percent of the drinking water for customers since beginning operations at the end of 2008. In 2014, the Water Authority met nearly 62 percent of its total system water demand with surface water from the DWP. The Water Authority anticipates that the DWP will meet about 55 to 65 percent of its total water demand for the 2015-2016 operating year.

General Project Operations and Operating Constraints

Operation of the DWP includes releases of stored SJC water from Heron Reservoir and conveyance of this water through the Rio Chama and Rio Grande stream and reservoir systems. The general operations plan for the DWP involves releases of the stored Water Authority’s SJC water from Heron Reservoir outlet works, conveyance of this water through El Vado Reservoir and the Rio Chama to the Water Authority’s storage space in Abiquiu Reservoir. Although the releases of SJC water from Abiquiu Reservoir will be primarily to deliver water as required for DWP diversions, the Water Authority’s SJC water also provides supplemental stream flows that benefit the Rio Grande Silvery Minnow.

Diversion of surface water is regulated by terms and conditions of Office of the State Engineer (OSE) Permit No. SP-4830. Under this permit, the Water Authority may divert surface water at a mean daily rate not to exceed 130 cubic feet per second (cfs), and the amount of native Rio Grande water may not exceed 50 percent of the total amount of water diverted at any time. In addition, an amount of water equivalent to the amount of native surface water diverted must be simultaneously returned directly to the Rio Grande at the Water Authority’s wastewater outfall. Only the SJC water may be consumed.

Under the permit, DWP diversions will be restricted from time to time by the OSE water rights permit for the DWP under certain river flow conditions as defined under Conditions 12 and 13 which read as follows:

12. The City shall regulate its surface water diversion rate under this permit and Permit No. 4819 to maintain, in so far as 'native' flow is available at and above the point of diversion, stream flows of not less than 122 cfs in the channel of the Rio Grande between the point of diversion and the Albuquerque Central Avenue gage.
13. Diversion of 'native' water from the Rio Grande under this permit shall be curtailed when 'native' flow in the channel of the Rio Grande is less than 195 cfs, measured immediately above the storage pool at the point of diversion by 1cfs for each 1cfs drop in 'native flow below 195 cfs. Diversion of 'native' water from the Rio Grande under this permit shall be suspended when any of the following situations exist: the amount of return flow to the City's SWRP outfall is less than the amount of 'native' water diverted; 'native flow in the channel of the Rio Grande is equal to or less than 130 cfs, measured immediately below the point of diversion; stream flows in the channel of the Rio Grande fall below 122 cfs, measured at the Albuquerque Central Avenue gage; or the State Engineer determines that suspension is necessary to meet compact obligations or to protect existing rights.

Runoff Forecast

Annual runoff forecasts and Annual Operating Plans for the Rio Grande are provided by the COE and Reclamation in April of each year. These forecasts are derived from snowpack estimates and subsequent runoff projections.

As in 2014, the April 1, 2015 forecast indicates that snowpack and associated runoff volumes will be below normal in the Rio Grande Watershed. The below-normal snowpack and its early melting is expected to yield lower than normal flow conditions throughout this runoff year. Based on the Natural Resource Conservation Service runoff forecast for 2015, the 50-percent exceedance flow forecast was selected for the COE and Reclamation's Annual Operating Plan. The Water Authority's AOP is based on the 50-percent exceedance forecast as well.

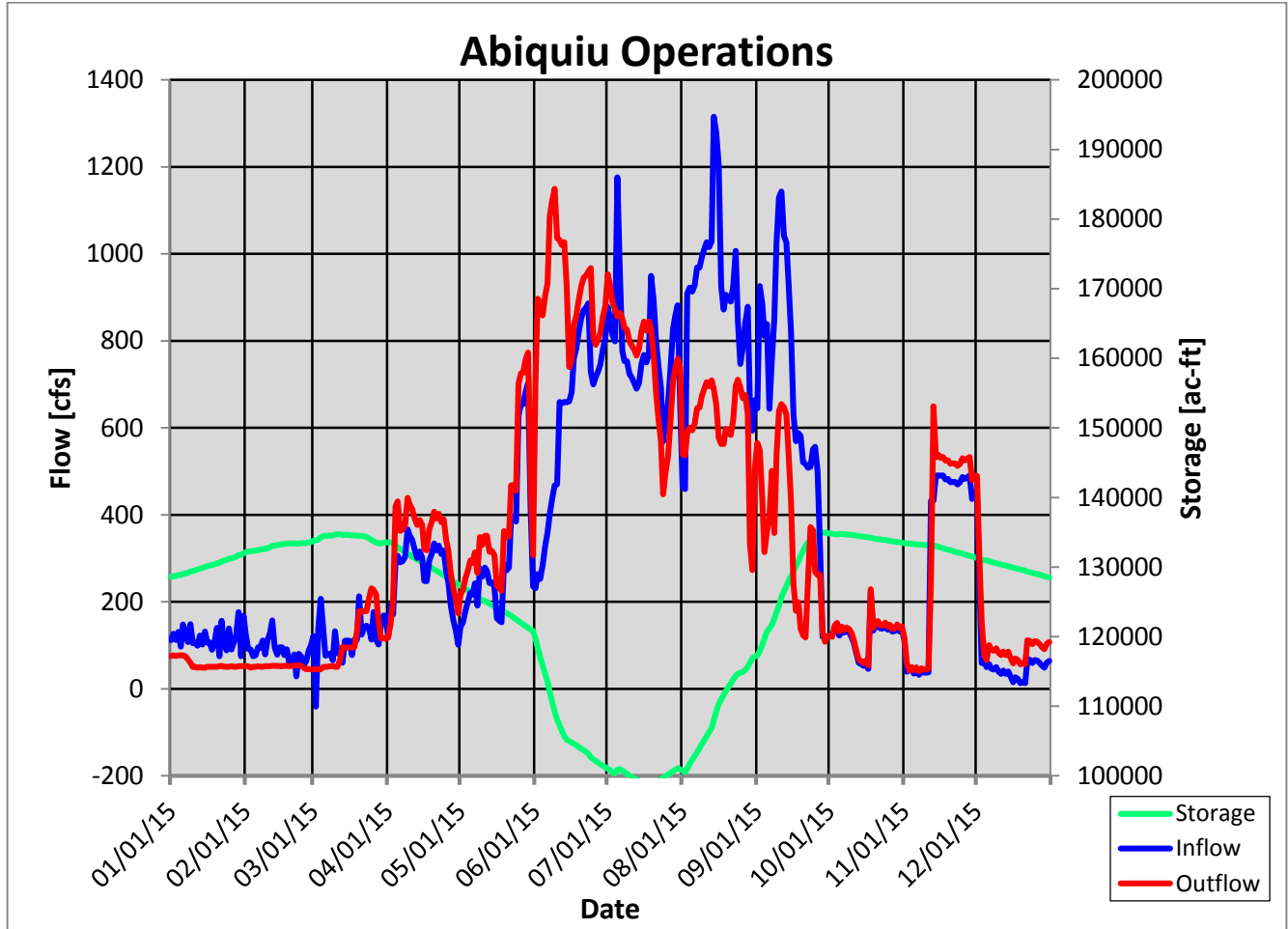
The COE projected inflows and outflows for Abiquiu Reservoir for the period April 1, 2015 through December 31, 2015 (assuming the 50-percent exceedance) are shown in Figure 1. The outflows include estimated releases of SJC water from all SJC contractors. In the event that the COE needs to set Abiquiu releases to the maximum downstream channel capacity of 1,800 cfs for flood operations, the Water Authority's SJC releases must be curtailed during that period, and any SJC water owed to the river must be replaced with SJC water in storage in Elephant Butte Reservoir. Otherwise, the outflows will generally mimic the inflow pattern. No flood operations are anticipated this year.

Based on the provided 50-percent exceedance flow forecast, the Water Authority anticipates curtailment of diversions through the period from late-September through October when native flows are expected to fall below 195 cfs for extended periods at the DWP point of diversion. Projected curtailments are reflected in the AOP presented below.

Critical flow levels above the DWP intake and at the Central Gage downstream will be affected not only by weather conditions but also by diversions for irrigation at the Angostura Diversion works of the Middle Rio Grande Conservancy District (MRGCD). Water Authority participation in the daily interagency Rio Grande Water Operations conference calls facilitates day-to-day monitoring of river flow conditions as well as coordinated actions among agencies. The Water Authority will be apprised in advance of impending critical flow levels and will plan its diversion curtailments accordingly.

Whenever projected flow conditions require curtailment of DWP diversions and associated releases of SJC water from Abiquiu Reservoir, the Water Authority intends to notify all interested agencies as far in advance of such actions as possible.

Figure 1. Projected 2015 Abiquiu Reservoir Operations



During the late irrigation season the MRGCD has the option of changing its operations from those performed since the implementation of the 2003 Biological Opinion (BO) and described in the Emergency Drought Water Management Agreement for the remainder of the irrigation season. Under this option, releases of SJC water from El Vado would be suspended in order to conserve irrigation storage carryover supplies in El Vado Reservoir. Because of very low runoff projected for this irrigation season, the MRGCD may need to begin releasing its stored water from El Vado several weeks earlier than normal, which may result in exhaustion of its stored water before the end of the irrigation season. If this happens, flow conditions on the river are likely to force the Water Authority to curtail its DWP diversions and SJC releases in late-September and October until streamflow conditions allow the Water Authority to resume DWP operations.

Recreational Releases for Rafting on the Rio Chama

For the last several years, the Water Authority has been able to allow its prior-year allotment of SJC water to be used for supplementing flows on the Rio Chama below El Vado reservoir during the summer months for the benefit of rafters. This action has been possible through a borrow-payback arrangement of SJC water with the MRGCD. On weekends from early May through Labor Day, releases from El Vado reservoir were typically increased to about 600 cfs or higher to provide adequate flows for rafting purposes. Because of a 15% shortage in SJC water deliveries to Heron Reservoir in 2014 and an even greater anticipated shortage this year, the Water Authority will keep its 2014 allotment of SJC water in Heron Reservoir until mid-August. Therefore, through coordination and agreement with the City of Santa Fe, the Memorial Day and June 2015 weekend rafting releases this year will be provided by the City of Santa Fe with releases of its SJC water currently stored in El Vado reservoir. From the July through mid-August, rafting releases are expected to be provided through coordinated releases of MRGCD's stored native and SJC water. In mid-August, the Water Authority plans to release its 2014 SJC water which will assist in providing rafting flows through September 2015.

Spring Peak Pulse Release

In past years, the Water Authority has coordinated with Federal agencies to release some of its SJC water from Abiquiu Reservoir in order to help provide peak spring "pulse" flows for minnow spawning and recruitment. Artificial pulse flows, followed by controlled recession flows have helped to create favorable spawning and recruitment conditions. Due to the low spring runoff this year, there are no plans for providing spring pulse releases during this operating year.

Annual Operating Plan

From April 2015 through March 2016, the Water Authority intends to meet as much of its potable water demand as feasible with purified surface water from the DWP. The primary constraint to DWP diversions is the availability of native water in the Rio Grande, which is expected to be below the diversion threshold from late-September through October 2015. The portions of the total water demand that cannot be met by the DWP will be met by groundwater and water reuse. Because it is necessary to keep production wells exercised to keep them operating properly, a minimum of 10 mgd (about 921 acre-feet (af) in a 30-day month) of the total water demand is expected to be met with groundwater year-round.

Table 1 shows a summary of planned diversions and releases over this operating year without SJC release curtailments required by the COE during flood operations (as noted previously, flood operations are not anticipated this year). For each month, the table shows the total diversion for the month, the anticipated average daily diversion rate, the total release of SJC water from storage in Abiquiu Reservoir, and the anticipated average daily release rate. The releases include the conveyance losses required under Permit SP-4830 as approved by the OSE. In April 2015, DWP target diversions were held at 62.5 million gallons per day (mgd) for most of the month. This diversion rate is expected to continue until the beginning of May, when the diversion rate will be ramped up to 78 - 80 mgd. Diversions are scheduled to continue at this rate through late August or early September if flow conditions permit. From late September through October, the Water Authority is likely to discontinue DWP diversions due to the anticipated low flow conditions in the Rio Grande and the MRGCD's demand on native flow. Groundwater diversions and reuse are expected to meet all of the Water

Authority demand during this period unless late-monsoon season rains produce hydrologic conditions favorable for DWP operation.

Table 1: Projected Drinking Water Project Diversions and San Juan Chama Project Water Releases from Abiquiu Reservoir from April 1, 2015 through March 31, 2016

Month	DWP Diversion (af)	AVG Daily Diversion (cfs)	SJC Release (af)	AVG Daily SJC Release (cfs)
Apr-15	5,459	91.7	2,846	47.8
May-15	7,993	130.0	4,161	67.7
Jun-15	7,736	130.0	4,113	69.1
Jul-15	7,993	130.0	4,296	69.9
Aug-15	7,440	121.0	3,999	65.0
Sep-15	2,797	47.0	1,503	25.3
Oct-15	0	0.0	0	0.0
Nov-15	5,541	93.1	2,825	47.5
Dec-15	4,349	70.7	2,217	36.1
Jan-16	4,396	71.5	2,241	36.4
Feb-16	4,288	74.5	2,186	38.0
Mar-16	5,866	95.4	2,991	48.6

Figure 2 shows monthly projected DWP diversions and SJC releases for the operating year. The monthly diversions reflect the daily diversion rate and the number of days in the month. In April, the actual monthly diversion was 5,459 acre-feet. Beginning in early May, the planned SJC release rate will increase to accommodate the anticipated monthly diversions between 7,993 and 7440 acre-feet between May and August. From late September July through October, DWP diversions are expected to cease due to anticipated low flow conditions and associated permit conditions. DWP diversions are expected to commence again at the end of the MRGCD irrigation season, and from November through March, the Water Authority plans to meet nearly 84% of its total demand with the DWP. During this five-month period, the average daily diversion rate is expected to be within a range of about 71 to 95 cfs, and monthly diversions will range from about 4,288 to 5,866 acre-feet.

Conveyance loss rates are specified on a monthly basis in the DWP diversion permit (SP-4830) from Heron Reservoir to the point of diversion. San Juan Chama releases presented in Table 1 and Figure 1 represent projected releases from Abiquiu Reservoir and, as such, include the diversion amount and the loss incurred from Abiquiu Reservoir to the point of diversion. The additional 1.1% transport loss from Heron to Abiquiu is not shown in these tables and figures but is accounted for through reduced inflow and subsequent storage volume in Abiquiu.

As long as streamflow conditions allow, the anticipated maximum daily diversion rate of 130 cfs during this operating year will be in compliance with OSE Permit 4830. The following bypass flows, as assumed under normal operations and as outlined in the BO are expected to be met:

1. A fishway bypass flow of 50 cfs on the east side of the river.
2. A bypass flow of 20 cfs at the outlet of the sluiceway on the east side of the river to provide for downstream movement of sediment and fish past the intake screens.
3. A total bypass flow of 130 cfs below the diversion intended to provide 100 cfs at the Central Bridge gage and accounting for potential transport and evapotranspiration losses of about 30 cfs.

Figure 2. Projected Monthly Water Authority DWP Diversions and SJC Releases For Operating Year

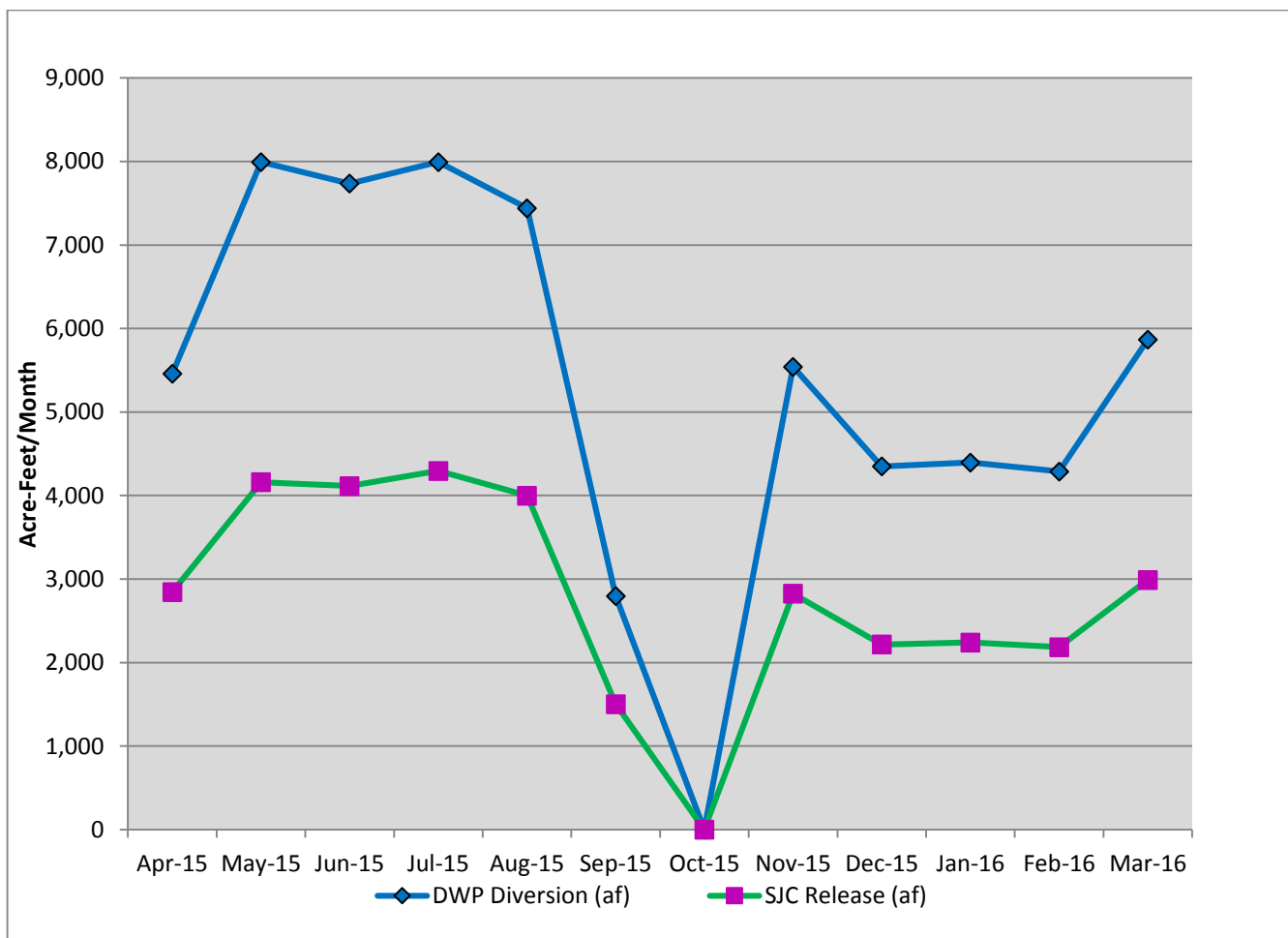
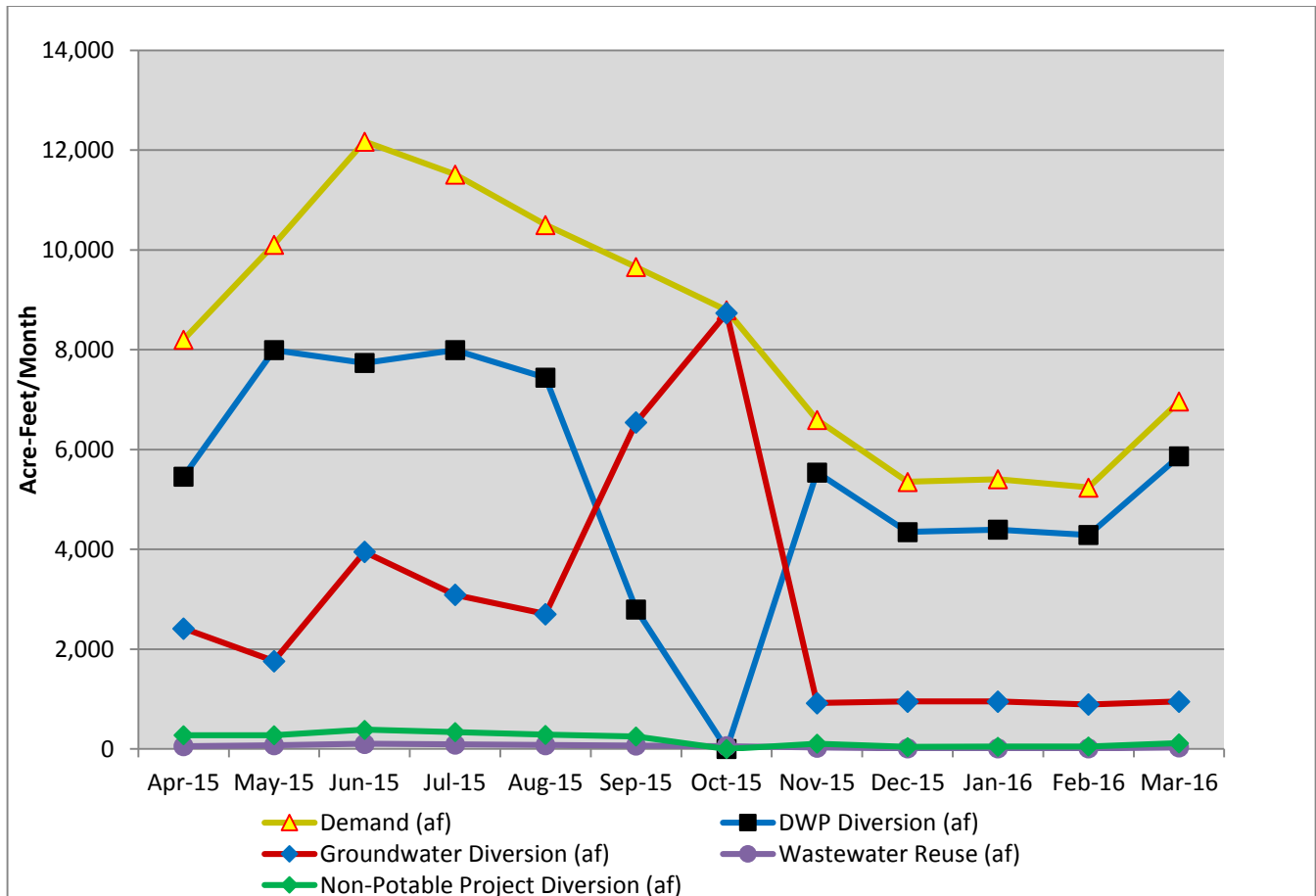


Table 2 and Figure 3 show the anticipated monthly amounts of water diverted from the Rio Grande by the DWP and the Non-Potable Project; groundwater diverted from wells; and treated wastewater from the Southside Reuse Project. The DWP diversions are characterized by a ramping up to the maximum monthly rates from May through August, followed by a ramping down in late September to no diversion in October as is expected to be required by projected flow conditions and permit conditions.

Table 2: Projected Water Authority Monthly Diversions from April 1, 2015 through March 31, 2016

Month	Drinking Water Project (af)	Groundwater (af)	Non-Potable Project (af)	Wastewater Reuse (af)	Total Monthly Demand (af)
Apr-15	5,459	2,414	277	55	8,205
May-15	7,993	1,762	277	75	10,108
Jun-15	7,736	3,948	386	104	12,173
Jul-15	7,993	3,090	339	91	11,513
Aug-15	7,440	2,703	284	77	10,503
Sep-15	2,797	6,543	250	67	9,656
Oct-15	0	8,736	0	55	8,791
Nov-15	5,541	921	107	29	6,597
Dec-15	4,349	951	40	11	5,352
Jan-16	4,396	951	46	13	5,406
Feb-16	4,288	890	48	13	5,239
Mar-16	5,866	951	115	31	6,964

Figure 3. Water Authority Projected Monthly Water Diversions



Throughout this operating year, the Water Authority plans to meet about 55-65 percent of its annual water demand with surface water from the DWP. Groundwater diversions will be required in varying amounts each month as needed to supplement demands that cannot be met with surface water. As mentioned previously, a minimum of 10 mgd of the total daily demand will be met by groundwater in order to ensure that the production wells are properly exercised. The highest monthly groundwater diversion is expected to occur in October (about 8,736 acre-feet) and the lowest monthly groundwater diversion is expected to occur in February (about 890 acre-feet). Groundwater diversions will be highest from June through October, followed by a sharp decline in November as total water demand decreases and DWP diversions resume. From November through March, about 84 percent of the total potable water demand is expected to be met with surface water from the DWP.

Conclusion

In conclusion, DWP operations during this operating year will again be constrained by the forecasted below-average flow conditions and high native water demands in the Rio Grande, but the time period over which the DWP must be shut down is not expected to last much more than one month. In addition to scheduling releases of its SJC water for DWP operations, the Water Authority will continue to coordinate SJC water releases to augment flows for recreational rafting on the Rio Chama, but opportunities for assisting with spawning and recruitment flows for the Rio Grande Silvery Minnow are not anticipated this spring due to the low spring runoff. Diversions from the DWP are expected to again meet over 55 percent of the total water demand for this operating year.

The Water Authority plans to divert surface water and operate the DWP to the extent allowed by hydrologic and associated permit conditions while using groundwater to meet a minimum of about 10 mgd of total daily water demand in all months. The DWP diversion rate will be increased to the maximum possible from May through September to meet late spring and summer demands. From late-September through October, no DWP diversions are anticipated due to expected low flow conditions in the Rio Grande during those months.

In the event that summer monsoons allow for additional diversions during the months of July through October, the Water Authority would coordinate releases and diversions with state and federal agencies. The projected El Nino weather pattern this summer could provide opportunities to increase production this year, but the Water Authority will need to determine the extent and available native water supplies during that time. If summer monsoons are lower than anticipated, DWP diversions may shut down in September, and not resume again until November. From November through March, nearly 84 percent of the total water demand is expected to be met by the DWP. Flows in the channel of the Rio Grande are expected to fall below the prescribed minimum rates in late September or early October, which will require the Water Authority to shut down DWP diversions as required to meet all permit conditions and all anticipated bypass flows.

ANNUAL OPERATING PLAN
FOR THE DRINKING WATER PROJECT
FOR OPERATING YEAR
APRIL 2015 THROUGH MARCH 2016

Water Authority Board

May 20, 2015



Albuquerque Bernalillo County
Water Utility Authority

The Annual Operating Plan (AOP)

- Requirement of 2004 US Fish and Wildlife Service Biological Opinion
- The Water Authority's anticipated maximum surface water diversions for the operating year based on forecasted surface water availability and water system demand
- Projected water demand for the 2015-16 operating year \approx 100,508 acre-feet \approx 32.75 billion gallons
- Over 55% of demand to be met with the DWP



AOP Monthly Water Diversions

