

Source	Cumulative Diversion Rate (cfs) All Rights	Cumulative Diversion Rate (cfs) Rts. Senior to 1900
Little Wood River	733.5	253.3
Silver Creek & tributaries	181.8	143.4
Total: L Wood + Silver Ck & tribs.	915.4	396.8

Table 1. Cumulative water right diversion rates for irrigation uses within the Little Wood River-Silver Creek system, WD37

Figure 4 shows the cumulative rate of diversion for irrigation water rights separately on Little Wood River and Silver Creek, with priorities senior to 1900. Note that the cumulative rate of diversion by priority is generally greater than the Little Wood River except for the period from 1884 through 1886, and from 1899 to 1900. The oldest or most senior priority rights, those through 1883, are located on Silver Creek or Silver Creek tributaries.

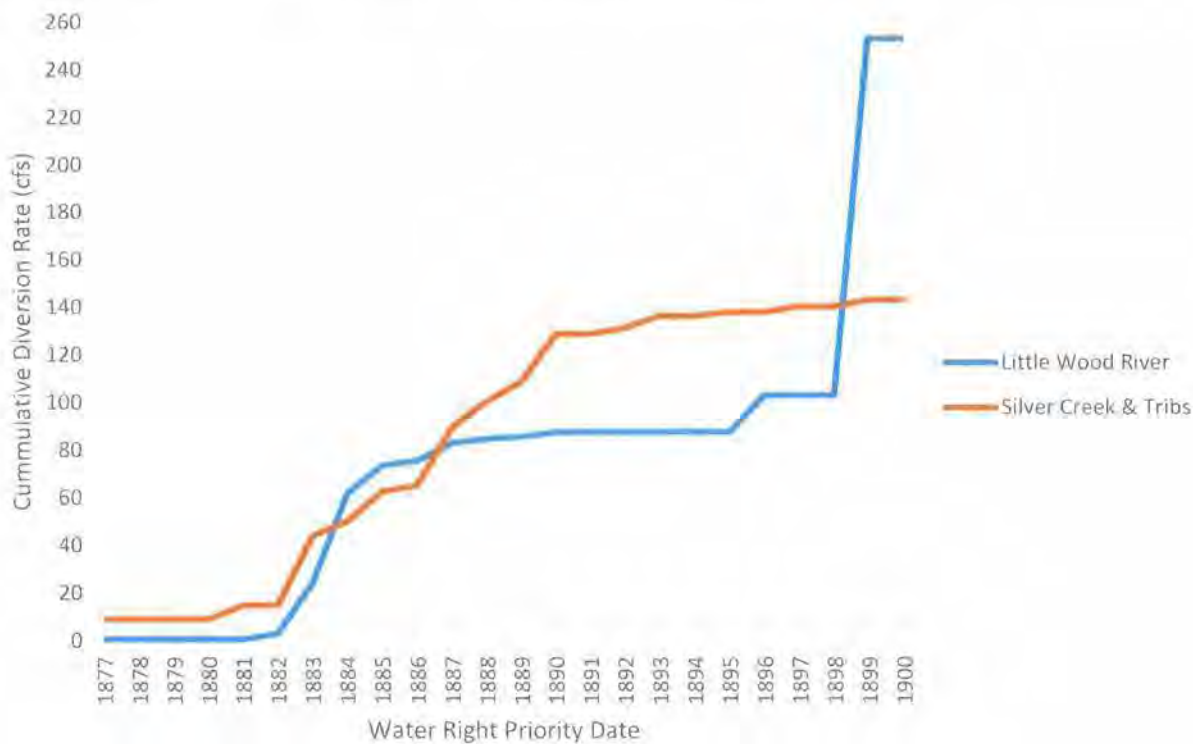


Figure 4. Figure 5. Cumulative water right diversion rates for irrigation uses from Little Wood River & Silver Creek, water rights with priority dates senior to 1900

Little Wood River Exchange Condition Water Rights

Thirty-eight (38) water rights from the Little Wood River have the BOR contract Exchange Condition described in items 3.2 and 8 of this memo. All 38 rights have points of diversion and places of use located below the Milner-Gooding Canal. These rights range in priority from 1877 through 1906 but most have 1883 or 1884 priority dates. Further information about the delivery and administration of these Little Wood River Exchange Condition rights is addressed in item 8 of this memo.

Little Wood River-Silver Creek Water Right Administration

WD37 administers water rights on the Little Wood River and Silver Creek as one system. An explanation of priority cut determinations on the Little Wood River and Silver Creek is given by WD37 Watermaster Kevin Lakey in his correspondence to IDWR dated June 16, 2015 in Luke (2015).

The watermaster's 2015 correspondence states that he bases his "priority cut date on flows at Station 54 at Shoshone." Station 54 is located on the river just upstream of the Milner-Gooding Canal. The watermaster notes that Station 54 accounts for return flows to the Little Wood from the Richfield tract. While the watermaster's 2015 explanations about priority cuts are unchanged, he has recently clarified that his cuts are also based on the list of water rights below Station 54.⁹ For example, if the watermaster determines there is 24 cfs of available natural flow in the Little Wood River at Station 54, he looks at his list of water rights on the Little Wood with points of diversion located below Station 54, sorted by priority; he then finds the priority date where the cumulative water right rates of diversion are equivalent to 24 cfs and sees that all water rights with priority dates through 5/15/1885 can be delivered. The next senior priority date on the list of rights below Station 54, 6/3/1884, is the priority date cut called by the watermaster. In this example, all water rights on both the Little Wood River and Silver Creek (including tributaries to Silver Creek) with a priority date of 6/3/1884 or junior are cut or shut off.

1884

Junior

Variability in Water Right Priority Deliveries in WD37

The depth and duration of water right priority cuts within WD37 may vary considerably depending on annual water supply and runoff conditions.

The IDWR staff memorandum from Sean Vincent dated May 17, 2021 ("Vincent Memo"), describes the Surface Water Supply Index (SWSI) as a predictive indicator of surface water availability in a basin compared to historic supply. The NRCS publishes a table with 10-, 30-, 50-, 70-, and 90-percent exceedance forecasts for the coming season along with measured total annual water supply volumes for the previous 30 years which are ranked from highest to lowest.

The IDWR staff memorandum from Phil Blankenau dated May 17, 2021 describes selection of three years having above-median, near-median and below-median water supply conditions based in part on water supply volumes and rankings over the past 30 years for the Big Wood River

⁹ Lakey, Kevin, Watermaster, Water District 37. Personal communication. May 14, 2021.

above Hailey, 1991 – 2020. The three select years are representative of a good water supply year, a normal or average water supply year and a water short year. Table 2 summarizes the measured total annual runoff volumes, SWSI values and rankings for the three select years as reported by the NRCS.¹⁰

Year	Stream Flow Apr - Sep (KAF)	30-Year Rank (1991-2020)	SWSI	Annual Water Supply Comment
2011	321	10	1.5	Good water supply year
2016	236	15	0.1	Normal water supply year
2013	154	22	-1.7	Water-short year

Table 2. Select water years representing above average, average and below average water supply conditions, Big Wood River above Hailey

The three select years listed in Table 2 are similarly ranked for the Big Wood River below Magic Reservoir based on NRCS published SWSI data, with 2011, 2016 and 2013 ranked 9th, 14th and 27th respectively. In 2013, the approximate fill in Magic Reservoir was only about 54, 000 AF (54 KAF). Although 2013 was a low runoff year for Big Wood River below Magic Reservoir, reservoir contents may have been affected in part by repairs to the dam late in 2012.

Tables 3, 4 and 5 show WD37 water right priority cuts in 2011, 2013 and 2016 for the three river systems in which separate priority cut determinations are made.

Focusing attention on the Little Wood River and Silver Creek, the tables show that nearly all water rights were delivered through a majority of the irrigation season in 2011, a good water supply year. According to the WD37 2011 report, “only the extreme junior [priority] (1960) Little Wood decrees were cut.”

In the normal or average water supply year, 2016, rights senior to April 1, 1899 were deliverable from April 20 to June 16, at which point rights with priorities of April 1, 1887 and junior were cut. By mid to late July, 1884 priority rights were cut for the rest of the season.

In the water-short year, 2013, the season started with a cut to 1902 priority rights. Rights were then cut to an 1887 priority by June 11, and to the April 1, 1884 priority date by July 9. Three days later on July 12, the September 9, 1883 priority rights were cut, followed by cuts to the April 1, 1884 priority rights from mid-August to late August and early September. The April 1, 1884 rights were not restored until late September.

1883

In 2013, Magic Reservoir was shut off about July 1. As discussed in IDWR’s Hydrologic Observations (2021), reservoir shutoff is typically seen as an abrupt, sustained decrease in the flow rate at the below Magic Dam gage from more than 500 cfs to less than 10 cfs. Typical reservoir releases are about 800 to 900 cfs.

¹⁰ https://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/swsi/tables/Apr/Big_Wood_above_Hailey_Apr.pdf

An early season shut off of Magic Reservoir can impact the natural flow and water right priority deliveries on the Little Wood River between Richfield and Shoshone due to lack of return flows from the Richfield tract. Moreover, storage deliveries from Magic are not injected to the Little Wood River near the Main Dietrich Canal via conveyance from the Jim Byrns Slough. As a result, occasional storage spills past the Main Dietrich Canal that benefits natural flow and senior priority rights are not available after the reservoir is shut off. As reported in the WD37 2011 report, “if Magic Reservoir is able to run a full season, the decrees on the Little Wood are upheld with return flows out of Richfield and Dietrich.”

In 2016, Magic Reservoir was shut off on approximately September 12, and in 2011, Magic Reservoir was shut off on approximately October 2.

Examples of water right priority cuts for two additional below average water years, 2020 (ranked 26 with a -2.8 SWSI and 121 KAF runoff) and 2004 (ranked 25 with a -2.6 SWSI and 136 KAF runoff), are given in Table 11 and discussed in Item 10 of this memo.

Water District 37 & 37M 2011 Priority Cuts BIG WOOD RIVER ABOVE MAGIC RESERVOIR WATER DISTRICT 37		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
July 26, 2011	June 1, 1901	
August 29, 2011	May 10, 1887	
September 2, 2011	June 15, 1885	
September 7, 2011	July 10, 1884	
September 15, 2011	June 15, 1883	
BIG WOOD RIVER BELOW MAGIC RESERVOIR WATER DISTRICT 37		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
August 4, 2011	April 1, 1906	
August 8, 2011	April 1, 1905	
August 15, 2011	April 27, 1896	
August 24, 2011	May 1, 1887	
SILVER CREEK & LITTLE WOOD RIVER WATER DISTRICT 37M		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
August 11, 2011	May 6, 1960	
August 12, 2011	May 27, 1899	Cottonwood Decree

Table 3. WD37 priority cuts in above average water year: 2011

Water District 37 2016 Priority Cuts		
BIG WOOD RIVER ABOVE MAGIC RESERVOIR		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
July 7, 2016	June 15, 1891	
July 12, 2016	May 1, 1886	
July 16, 2016	October 15, 1884	
July 19, 2016	June 30, 1884	
July 20, 2016	June 20, 1884	
July 25, 2016	May 15, 1884	
July 26, 2016	June 26, 1883	
July 29, 2016	June 15, 1883	
BIG WOOD RIVER BELOW MAGIC RESERVOIR		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
June 30, 2016	April 1, 1906	
July 5, 2016	April 1, 1905	
July 13, 2016	June 15, 1890	
July 26, 2016	April 3, 1889	
SILVER CREEK & LITTLE WOOD RIVER		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
March 31, 2016	Oct. 29, 1891	
April 20, 2016	April 1, 1899	Reinstate & Senior
May 24, 2016		Reinstate all Decrees
June 16, 2016	April 1, 1887	
June 30, 2016	April 1, 1886	
July 7, 2016	May 27, 1899	Cottonwood Decree
July 18, 2016	May 15, 1884	
July 26, 2016	April 1, 1884	

Table 4. WD37 priority cuts in average water year: 2016

Water District 37 & 37M 2013 Priority Cuts		
BIG WOOD RIVER ABOVE MAGIC RESERVOIR		
WATER DISTRICT 37		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
April 23, 2013	June 1, 1901	
May 1, 2013	June 1, 1901 & Junior	Reinstate
July 8, 2013	September 18, 1885	
July 9, 2013	October 15, 1884	Cut 50%
July 10, 2013	July 10, 1884	
July 11, 2013	June 15, 1883	
July 19, 2013	April 17, 1883	
July 23, 2013	March 24, 1883	Cut 50%
August 2, 2013	March 24, 1883	Cut 100%
August 6, 2013	December 19, 1882	
August 8, 2013	August 1, 1882	
August 19, 2013	May 15, 1882	
August 26, 2013	July 31, 1881	
August 30, 2013	July 1, 1881	
September 4, 2013	August 1, 1882	Reinstate
BIG WOOD RIVER BELOW MAGIC RESERVOIR		
WATER DISTRICT 37		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
April 26, 2013	July 1, 1889	
April 30, 2013	May 10, 1897	Reinstate
May 13, 2013	All Decrees	Reinstate
June 24, 2013	May 1, 1897	
June 28, 2013	All Decrees	Magic Off
September 6, 2013	April 15, 1887	Reinstate
SILVER CREEK & LITTLE WOOD RIVER		
WATER DISTRICT 37M		
Date Priority Cut Made	Date of Priority Cut to and including:	Remarks
April 30, 2013	August 2, 1902	
June 11, 2013	June 15, 1887	
June 25, 2013	May 27, 1899	Cottonwood Decree
July 9, 2013	April 1, 1884	
July 12, 2013	September 1, 1883	
August 14, 2013	April 6, 1883	
August 19, 2013	April 1, 1883	
August 27, 2013	April 1, 1883	Reinstate 50%
September 6, 2013	April 6, 1883	Reinstate
September 10, 2013	September 1, 1883	Reinstate 30%
September 18, 2013	September 1, 1883	Reinstate 60%
September 24, 2013	September 1, 1883	Reinstate 85%
September 26, 2013	April 1, 1884	Reinstate 100 %

Table 5. WD37 priority cuts in below average water year: 2013

8. Water Right Exchange Condition

The water right Exchange Condition is generally described in item 3.2 of this memo and in further detail by Luke (2015). The Exchange Condition is also explained in a recent IDWR memorandum to WD37 watermaster Kevin Lakey (Luke, 2021).¹¹ See Attachment B. Please refer to these memorandums for more detailed explanations of the condition.

As reported in Luke (2021), Snake River water from the Milner-Gooding Canal is delivered by AFRD2 to the Exchange Condition river rights, and water from the Big and Little Wood Rivers that would be delivered to the Exchange Condition river rights but for the delivery of Snake River water is instead delivered to water rights and lands located above the Milner-Gooding Canal.

In accordance with the Exchange Condition, the WD37 watermaster has been instructed to withhold the physical delivery or conveyance of the natural flow from the Little Wood or Big Wood Rivers below the Milner-Gooding Canal to benefit the Exchange Condition water rights, and deliver any natural flow from the rivers available to fill the Exchange Condition rights to BWCC's diversions located above the Milner-Gooding Canal. In the event BWCC has no demand or need for water above the Milner-Gooding Canal that is deliverable by priority to the Exchange Condition water rights, the water shall then be distributed to the next available rights in priority either above or below the Milner-Gooding Canal on the Big Wood River, and the Little Wood River and Silver Creek.

Based on recent communication with AFRD2 representatives and the WD37 watermaster,¹² as well as past correspondence from the WD37 watermaster attached to Luke (2015), IDWR understands that most or all of the Exchange Condition water right places of use have a supplemental supply of water from the Snake River delivered by AFRD2 via the Milner-Gooding Canal. The watermaster has explained that when a river right place of use has AFRD2 supplemental water and the river right is cut by priority, the supplemental water replaces the river right after the right is cut (Lakey correspondence, June 16, 2015, in Luke, 2015).

IDWR staff finds there may be some lack of clarity or understanding among water users and the water delivery entities regarding the delivery of Exchange Condition rights and the extent of AFRD2 supplemental water delivered to the lands covered by such rights. Unless additional information is furnished regarding available water supplies for lands with Exchange Condition water rights, IDWR assumes such lands have a full supply of water in 2021 and most other

¹¹ Luke, T., 2021, *Delivery of Water Rights in Water District 37 from the Big Wood and Little Wood Rivers having the BOR-AFRD2-BWCC Exchange Condition*. Idaho Department of Water Resources, April 27, 2021.

¹² Personal communication with Craig Hobdey, AFRD2 attorney (retired), and Kevin Lakey, WD 37 Watermaster, at meeting of AFRD2, BWCC and BWRGWMA Advisory Committee representatives, March 31, 2021, Shoshone, ID (participation via Zoom conference call).

years.¹³ Therefore, IDWR assumes that the Exchange Condition rights are not injured from depletion of river flows caused by groundwater pumping.

9. Identification of Irrigated Lands Potentially Injured by Groundwater Pumping

This section describes technical information relevant to IDWR analysis to identify lands irrigated from the Little Wood River and Silver Creek that could be injured by depletions caused by groundwater pumping within the 2021 irrigation season. Lands identified for potential injury were further analyzed by IDWR staff using an evapotranspiration (ET) model as further described in a separate staff memorandum.

Water Right Data

Water Right spatial data, including GIS feature layers representing Points of Diversion (POD) and Places of Use (POU), are available through IDWR's GIS Data and Mapping Hub.¹⁴ Irrigation water right POD's with sources from the Little Wood River, Silver Creek, and Silver Creek tributaries within Water District 37 were selected using IDWR's water rights GIS and database information search tools.

A water right POU from one source may have overlapping water rights from other sources. Many irrigated areas within WD37 have overlapping groundwater and surface water right POUs (Figure 4).
5

Upon selection of all water rights from the described surface water sources in WD37, IDWR staff then excluded water rights having the following features or attributes:

- water rights having a source described as “drain” or “wastewater” because the source may be dependent on other water sources or irrigation practices, or may be unreliable;
- water rights owned by the BWCC and AFRD2 since lands may receive water from other sources;
- water rights having the Exchange Condition described in items 3 and 8 of this memo; many or most of those water right POUs may have an adequate supply of water; and
- all water rights that have an overlapping POU from a groundwater source.

IDWR staff added water rights 37-351B and 37-352B to the resulting water rights list. These rights list “groundwater” as the authorized source of water but include conditions limiting the use of water to times when water is deliverable from Silver Creek under the rights' priority dates.

The resulting list of water rights are listed in Attachment A of this memo. The water right POU locations are displayed in Figure 6. The list of water rights and associated POU GIS shape files were made available to IDWR staff as input to the ET model as discussed in the IDWR staff memorandum from Phil Blankenau dated May 17, 2021.

¹³ According to Water District 01 records, AFRD#2 has had a full (100%) storage allocation in 29 of the previous 30 years, IDWR (2021).

¹⁴ IDWRs GIS data and Mapping Hub, <https://data-idwr.opendata.arcgis.com/>.