

SPECIAL IMPROVEMENT DISTRICT NO. 6 OF THE
RIO GRANDE WATER CONSERVATION DISTRICT

ANNUAL REPORT FOR
2023 PLAN YEAR

Prepared

July 1, 2024

By

Rio Grande Water Conservation District
8805 Independence Way
Alamosa, Colorado 81101

Table of Contents

INTRODUCTION.....	1
1.0 DATABASE OF ARP WELLS COVERED BY THE 2023 ARP	2
2.0 CALCULATION OF STREAM DEPLETIONS TO THE RIO GRANDE, CONEJOS AND ALAMOSA RIVERS RESULTING FROM ARP WELL GROUNDWATER WITHDRAWALS FOR THE 2023 PLAN YEAR.....	2
2.1 2023 STREAM FLOW FORECASTS COMPARED TO ACTUAL FLOWS	2
2.1.1 2023 STREAM FLOW FORECASTS	2
2.1.2 2023 ACTUAL STREAM FLOWS.....	3
2.2 PROJECTED 2023 GROUNDWATER WITHDRAWALS COMPARED TO ACTUAL METERED 2023 GROUNDWATER WITHDRAWALS.....	3
2.2.1 2023 PROJECTED GROUNDWATER WITHDRAWALS FROM ARP WELLS.....	3
2.2.2 2023 ACTUAL GROUNDWATER WITHDRAWALS FROM ARP WELLS .	4
2.3 PROJECTED 2023 STREAM DEPLETIONS COMPARED TO ACTUAL STREAM DEPLETIONS....	4
3.0 OPERATION OF THE SUBDISTRICT NO. 6 2023 ANNUAL REPLACEMENT PLAN.....	11
4.0 DOCUMENTATION OF PROGRESS TOWARDS ACHIEVING AND MAINTAINING A SUSTAINABLE WATER SUPPLY	14
5.0 ADDITIONAL INFORMATION TO EVALUATE 2023 ARP.....	15

Tables

2.0 Stream Flow Forecasts	3
2.1 Estimated Net Groundwater Consumptive Use	5
2.2 Estimated Historical and Projected Stream Depletions from Groundwater Withdrawals in Subdistrict No. 6.....	6
2.3 Subdistrict No. 6 Monthly Stream Depletions for Plan Year	9
2.4 Subdistrict No. 6 Post-Plan Stream Depletions	10
2.5 Comparison of Subdistrict No. 6 2023 Projected and Calculated Stream Depletions.....	10
3.1 Monthly Stream Depletions by Stream Reach for the 2023 ARP and Replacement Sources Used to Remedy the Depletions	12

Appendices

- Appendix A Tabulation of 2023 Groundwater Withdrawals for Subdistrict ARP Wells
- Appendix B Division No. 3 Division Engineer’s Final Rio Grande Compact 10-day Report (dated January 3, 2024)
- Appendix C Comparison of Daily Projected and Actual Stream Depletions for Plan Year 2023 and the Daily Replacement Amounts
- Appendix D Daily Accounting of Amount and Source of Replacement for Rio Grande, Conejos and Alamosa rivers for 2023 Plan Year
- Appendix E Instruction Sheets: “How to Use the Application Workbook for a Subset (individual/group) of Wells” 9/23/2015) and “How to Adjust the Application Workbook for use with a Subset of Wells” (10/15/2015)
- Appendix F Approval Letters from DWR for Depletion Rate Adjustments

Abbreviations

ARP	Annual Replacement Plan
DWR	Division of Water Resources
NRCS	Natural Resources Conservation Service
Plan Year	The period May 1, 2023, through April 30, 2024
PWM	Plan of Water Management
PWR	Preliminary Water Report
Response Functions	RFApplication_C_Conejos_6P98_V1.1
RGDSS	Rio Grande Decision Support System
RGWCD	Rio Grande Water Conservation District
Subdistrict No. 6	Special Improvement District No. 6
ARP Wells	Wells Benefitting Subdistrict No. 6 lands
SWSP	Substitute Water Supply Plan
USDA	United States Department of Agriculture
WDID	Water District Structure Identification Number

INTRODUCTION

The purpose of this report is to satisfy the requirements for an Annual Report to analyze the Annual Replacement Plan (ARP) for May 1, 2023, through April 30, 2024 (Plan Year). This Annual Report has been prepared in accordance with the requirements of the State Engineer and the Rules Governing the Withdrawal of Groundwater in Water Division No. 3 (the Rio Grande Basin) and Establishing Criteria for the Beginning and End of the Irrigation Season in Water Division No. 3 for All Irrigation Water Rights (Groundwater Rules).

As required by the Groundwater Rules, this report includes information necessary for the State Engineer and Subdistrict No. 6 staff to calculate stream depletions attributable to Subdistrict No. 6 Wells and Contract Wells (ARP Wells), as those terms are defined in the PWM, and information to assess the progress of replacement operations under the current approved ARP. This report includes a series of tables prepared by Subdistrict No. 6 staff utilizing the most current version of the Alamosa-LA Jara Response Functions (Response Functions) to tabulate the location and quantities of stream depletions resulting from actual metered 2023 Subdistrict No. 6 ARP Well groundwater withdrawals and 2023 Rio Grande, Conejos and Alamosa River stream flows.

This Annual Report describes the amount and timing of replacements and/or remedies that have been completed by the Subdistrict under the 2023 ARP and the sources used to make those replacements.

1.0 DATABASE OF ARP WELLS COVERED BY THE 2023 ARP

A comprehensive ARP Well List was included in the 2023 ARP to identify the wells DWR permitted to continue operating in accordance with the PWM and the Groundwater Rules. This ARP Well List is necessary for DWR to identify which wells the Subdistrict has included. Further, the ARP Well List is a required input into the RGDSS Groundwater Model and Response Functions.

Appendix A is the most current tabulation of the WDID of each well included in the ARP and the preliminary groundwater withdrawals reported to DWR for each ARP Well for the 2023 Water Administration Year. The ARP Well List includes 539 ARP Wells for 2023. Five (5) wells are being omitted from the ARP Well List through this Annual Report. Four (4) wells associated with Esperanza Farms with WDIDs of 2009672, 2010109, 2010287 and 2012431 were not contracted in for the 2023 Plan Year.

2.0 CALCULATION OF STREAM DEPLETIONS TO THE RIO GRANDE, CONEJOS AND ALAMOSA RIVERS RESULTING FROM ARP WELL GROUNDWATER WITHDRAWALS FOR THE 2023 PLAN YEAR

The purpose of this section of the 2023 Annual Report is to present data the Subdistrict utilized to analyze stream depletions to the Rio Grande, Alamosa and Conejos rivers as a result of the actual 2023 groundwater withdrawals from Subdistrict No. 6 ARP Wells which were reported to DWR. This analysis compares the projected calculation of depletions presented in the 2023 ARP to the current calculation prepared using the most up-to-date information available from DWR for actual stream flows and groundwater withdrawals. Subdistrict No. 6 was directed by DWR to use the current 6P98 Response Functions to calculate stream depletions for the 2023 ARP.

2.1 2023 STREAM FLOW FORECASTS COMPARED TO ACTUAL FLOWS

2.1.1 2023 STREAM FLOW FORECASTS

The Division No. 3 Division Engineer's March 31, 2023, Rio Grande Compact forecast for the Rio Grande and Conejos were used to estimate groundwater consumption attributable to ARP Wells based upon hydrologic conditions for the current Plan Year. The Division Engineer forecasted 659,200 acre-feet on the Rio Grande and 373,600 acre-feet on the Conejos River. The NRCS's April 1, 2023, forecast of the projected annual flow of the Alamosa River of 94,000 acre-feet was used to estimate groundwater consumption attributable to ARP Wells based upon hydrologic conditions for the current Plan Year on that system. The NRCS also estimated the annual flow of the Conejos, Los Pinos and San Antonio, and these streamflow forecasts were also reviewed to assist Subdistrict staff in projecting hydrologic conditions for the current Plan Year. These forecasts are shown in Table 2.0 below.

**Table 2.0
Stream Flow Forecasts
(units in acre-feet)**

Conejos Stream Flow Forecast				
Analysis	Apr-Sept Forecast (acre-feet)	% of Avg.	Estimated Additional (acre-feet)	Annual Estimated Flow (acre-feet)
	(1)	(2)	(3)	
NRCS, 4/1/2023				
Conejos River near Mogote	280,000	167		
Los Pinos River near Ortiz	108,000	177		
San Antonio River at Ortiz	24,000	250		
Total Conejos River System	412,000			
Division Engineer, Ten Day, 3/31/2023				
Conejos River near Mogote	240,400	143		
Los Pinos River near Ortiz	117,700	193		
San Antonio River at Ortiz	15,500	162		
Total Conejos River System	373,600		26,400	400,000
Rio Grande Stream Flow Forecast				
Analysis	Apr-Sept Forecast (acre-feet)	% of Avg.	Estimated Additional (acre-feet)	Annual Estimated Flow (acre-feet)
	(1)	(2)	(3)	
NRCS, 4/1/2023	625,000	130		
Division Engineer, Ten Day 3/31/2022	659,200	137	90,800	750,000
Alamosa Stream Flow Forecast				
Analysis	Apr-Sept Forecast (acre-feet)	% of Avg.	Estimated Additional (acre-feet)	Annual Estimated Flow (acre-feet)
NRCS, 4/1/2022	94,000	154		

- (1) Projected 50% exceedance streamflow at the gaging station
- (2) NRCS 30-yr Average Flow: Conejos-168,000, Rio Grande-480,000, Alamosa-61,000, Los Pinos-61,000, San Antonio-9,600
- (3) January through March and October through December

2.1.2 2023 ACTUAL STREAM FLOWS

Based on the Division 3 Division Engineer’s Preliminary Final Rio Grande Compact Ten-Day Report dated January 3th, 2024, the April-September Rio Grande flows were approximately 639,600 acre-feet and the Conejos flows were 241,500 acre-feet. This is a decrease on the Rio Grande and an increase on the Conejos compared to the forecasted amount for the same time period. A copy of the Division No. 3 Division Engineer’s Preliminary Rio Grande Compact Ten-Day Report is included as Appendix B.

2.2 PROJECTED 2023 GROUNDWATER WITHDRAWALS COMPARED TO ACTUAL METERED 2023 GROUNDWATER WITHDRAWALS

2.2.1 2023 PROJECTED GROUNDWATER WITHDRAWALS FROM ARP WELLS

The Subdistrict projected groundwater withdrawals from ARP Wells listed in the 2023 ARP by reviewing prior year stream flow data for years most comparable to the 2023 forecasted stream

flows on the Rio Grande, groundwater withdrawal for those comparable years for all ARP Wells, projected Subdistrict No. 6 operations, weather predictions and antecedent conditions. The projected 2023 ARP Well groundwater withdrawals were **73,500 acre-feet**. It was anticipated that the vast majority of metered groundwater withdrawals from ARP Wells in 2023 would be used for irrigation through center pivot sprinklers.

2.2.2 2023 ACTUAL GROUNDWATER WITHDRAWALS FROM ARP WELLS

Based on information obtained from DWR's published records on June 1, 2024, for the 2011-2022 metered withdrawals, preliminary meter records for 2023 downloaded from DWR's HBDMC, and estimates made by Subdistrict staff, the actual metered groundwater withdrawals from Subdistrict No. 6 ARP Wells were **91,647 acre-feet** for the 2023 Water Administration Year. The significant increase in groundwater withdrawals may have been the result of a lack of monsoons that are typical during the summer months. A majority of the groundwater withdrawn from these ARP Wells was used for irrigation through center pivot-sprinklers.

2.3 PROJECTED 2023 STREAM DEPLETIONS COMPARED TO ACTUAL STREAM DEPLETIONS

Subdistrict No. 6 staff were instructed by the State Engineer's Office to predict stream depletions to the affected streams caused by groundwater withdrawals from ARP Wells utilizing the response functions developed for the Alamosa-La Jara Response Area under the RGDSS Groundwater Model Phase 6P98. For the Plan Year, stream depletions attributable to the groundwater withdrawals from ARP Wells were calculated using these Response Functions.

The Response Functions spreadsheet was built to be used for the whole Response Area. Two instruction sheets were prepared by DWR for additional inputs to the Response Functions when there is a need to use it for individual or group of wells. The instruction sheet, "How to Use the Application Workbook for a Subset (individual/group) of Wells" (9/23/2015), describes how to adjust the spreadsheet inputs to stream reaches that have been modeled with point source returns to streams. The instruction sheet, "How to Adjust the Application Workbook for use with a Subset of Wells" (10/15/2015), describes how to use the "Ratio Method" for Response Areas where it is necessary to apply this method. Both instruction sheets are included as Appendix E.

The first step in using the current 6P98 Response Functions is to input data for the whole Response Area, i.e., historical groundwater withdrawals for sprinkler irrigation, flood irrigation, "other" pumping with corresponding "other" consumptive use ratios for the years 2011 through 2023.

The Subdistrict elected to use the Response Functions spreadsheet for the subset of wells which were included in the 2023 ARP Well List. The Alamosa-La Jara Response Area requires adjustments for point source return flows and the stream ratios, as listed below.

- Alamosa-La Jara Response Area - Reach 3 (Rio Grande from Del Norte to Excelsior Ditch) from the City of Monte Vista and Reach 5 (Rio Grande from Chicago to the State Line) from the City of Alamosa

• Conejos: Reach 1 Calculations Ratio and Reach 6 Calculations Ratio

Using the whole Response Area results, adjustments are made on appropriate pages of the Response Function spreadsheet. The Subdistrict ARP Wells do include the City of Monte Vista and City of Alamosa point source return flow, therefore, point source return flows were not adjusted in the spreadsheet. Adjustments for the Ratio Method were made for Reach 1: Conejos above Seledonia/Garcia and Reach 6: Alamosa River.

The next step was to calculate stream depletions by updating the Response Functions table contained in Table 2.1 to derive the annual net groundwater consumptive use. The consumptive use ratios for sprinkler and flood irrigation used in the RGDSS Model are standard factors of 83% and 60%, respectively. The consumptive use ratio for “other” wells is specific to the uses of those wells and can vary widely. The “Other Consumptive Use Ratio” for the whole Response Area is a composite derived from the individual well withdrawals and consumptive uses. The Subdistrict prepared a separate spreadsheet of “other” wells included in the Subdistrict’s 2023 ARP Well List to show the individual well groundwater withdrawals and consumptive use factors used to explain how the composite ratios were determined for the subset of wells represented in Table 2.1 of the 2023 ARP.

Historical groundwater withdrawal values for wells included in the ARP Well List were entered in Table 2.1 for years 2011 through 2023. The Subdistrict has no Recharge that Offsets Groundwater for calculation of the Net Groundwater Consumptive Use.

Notes at the bottom of Table 2.1 provide a description of the calculations within this table.

Table 2.1
Estimated Net Groundwater Consumptive Use
 (Units in acre-feet)

Year	Subdistrict No. 6 ARP Wells Groundwater Withdrawals					Recharge that Offsets Groundwater				Net Groundwater Consumptive Use
	Irrigation Pumping to Center Pivots	Irrigation Pumping to Flood Irrigation	Other Pumping	Other Consumptive Use Ratio	Groundwater Consumption	Recharge Source 1	Recharge Source 2	Other Recharge Offsets	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2011	85,088	6,944	25,988	51%	88,043	0	0	0	0	88,043
2012	82,803	6,261	24,245	51%	84,849	0	0	0	0	84,849
2013	80,706	7,311	23,222	51%	83,216	0	0	0	0	83,216
2014	64,832	5,923	22,886	51%	69,036	0	0	0	0	69,036
2015	56,332	6,885	23,387	50%	62,579	0	0	0	0	62,579
2016	57,107	4,079	21,911	51%	61,021	0	0	0	0	61,021
2017	49,005	4,564	21,875	52%	54,788	0	0	0	0	54,788
2018	86,051	6,759	23,247	53%	87,799	0	0	0	0	87,799
2019	45,933	3,968	20,326	51%	50,872	0	0	0	0	50,872
2020	78,471	5,081	22,826	55%	80,734	0	0	0	0	80,734

2021	71,222	5,315	24,744	55%	75,913	0	0	0	0	75,913
2022	70,570	5,189	21,194	54%	73,131	0	0	0	0	73,131
2023	64,168	4,851	22,628	54%	68,389	0	0	0	0	68,389
Avg	68,638	5,625	22,960	52%	72,336	0	0	0	0	72,336

Explanation of Columns

- (1) Calendar Year
- (2) Determined from metered groundwater pumping
- (3) Determined from metered groundwater pumping
- (4) Determined from metered groundwater pumping
- (5) Estimated based on operations metered in Col4
- (6) Calculated as 0.83xCol2 + 0.60xCol3 + Col4xCol5
(0.83 and 0.60 are the consumptive use ratios of total pumping associated with sprinkler and flood irrigation practices, respectively)
- (7) - (9) Determined by engineering consultant to the District from analysis of historic diversions and recharge decrees
- (10) Calculated as Col7 + Col8 + Col9
- (11) Calculated as Col6 - Col10

Wells that are added or deleted to the ARP Well List affect historical groundwater withdrawals figures as follows:

- Any wells that are added to the ARP will have their historical groundwater withdrawals included
- Any wells that are deleted from the ARP will have their historical groundwater withdrawals included in the groundwater withdrawals until the year that the wells are dropped
- If any wells that were deleted from a previous ARP list are added back in, any historical groundwater withdrawals from the years they were out will have to be included in the groundwater withdrawals

The projected Net Groundwater Consumptive Use for the Plan Year is **68,389 acre-feet** as shown in Table 2.1.

The Net Groundwater Consumptive Use for 2023 derived in Table 2.1 above is then input into the Response Function table contained in Table 2.2 in Column 3 in the row for 2023 to calculate projected stream depletions for the 2023 Plan Year and into the future. The projected annual stream depletions resulting from the groundwater withdrawals of the wells included in the 2023 ARP Well list for the respective reaches and the total are shown in Columns 4 through 7.

Table 2.2
Estimated Historical and Projected Net Stream Depletions from
Groundwater Withdrawals in Subdistrict No. 6
(Units in acre-feet)

Year	Rio Grande near Del Norte Stream Gage (Apr-Sep)	Net Groundwater Consumptive Use (Jan-Dec)	Conejos above Seledonia/Garcia	Conejos below Seledonia/Garcia	Rio Grande Del Norte-Excelsior	Rio Grande Excelsior-Chicago	Rio Grande Chicago-State Line	Alamosa River	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1970	561,150	66,877	160	2,396	-227	345	-1,519	514	1,669
1971	389,397	73,564	136	3,348	320	891	-1,178	545	4,063
1972	373,031	88,472	96	4,203	901	1,470	-982	594	6,282
1973	755,509	65,461	176	3,537	1,102	1,675	-802	643	6,332
1974	270,942	93,141	162	4,421	1,151	1,954	-628	605	7,666
1975	730,848	65,439	179	3,695	1,198	2,067	-378	650	7,409
1976	512,997	72,243	144	4,025	1,201	1,952	-367	448	7,403
1977	163,635	100,963	96	4,909	1,363	2,306	-270	268	8,672

1978	340,660	85,721	166	4,814	1,637	2,585	51	619	9,871
1979	886,617	64,046	189	3,874	1,630	2,498	-96	670	8,764
1980	672,668	73,419	174	4,138	1,534	2,305	-144	596	8,603
1981	310,945	88,302	101	4,520	1,555	2,509	-46	622	9,260
1982	572,474	64,258	188	3,979	1,530	2,500	226	689	9,111
1983	578,510	65,132	186	3,842	1,524	2,402	37	681	8,671
1984	652,637	62,386	180	3,695	1,554	2,368	-57	659	8,399
1985	864,564	57,098	177	3,282	1,469	2,280	-290	649	7,568
1986	865,371	52,371	171	2,978	1,252	2,065	-441	628	6,653
1987	907,650	66,191	161	3,337	1,118	1,924	-651	586	6,475
1988	346,087	88,042	141	4,397	1,210	1,970	-554	521	7,685
1989	407,389	88,277	145	4,700	1,512	2,230	-350	536	8,772
1990	424,033	80,296	149	4,508	1,530	2,372	-212	536	8,883
1991	529,567	70,757	165	4,160	1,319	2,330	-311	528	8,191
1992	415,482	71,699	147	4,084	1,519	2,329	-466	551	8,163
1993	577,831	55,600	169	3,527	1,345	2,205	-176	600	7,671
1994	444,629	77,901	171	4,113	1,555	2,301	-669	555	8,027
1995	734,492	47,289	167	3,092	1,321	2,119	-794	610	6,514
1996	313,441	88,394	154	4,202	1,146	2,237	-679	577	7,637
1997	781,596	60,848	172	3,505	1,307	2,237	-602	626	7,244
1998	466,821	75,474	149	4,030	1,404	2,195	-643	535	7,670
1999	799,489	51,779	152	3,178	1,295	2,082	-524	405	6,589
2000	312,094	94,174	85	4,407	1,146	2,210	-900	237	7,186
2001	655,233	73,065	134	4,201	1,248	2,308	-407	416	7,900
2002	96,717	112,680	81	5,327	1,551	2,645	-394	133	9,345
2003	261,300	102,124	96	5,339	1,794	2,977	361	267	10,833
2004	431,675	79,199	167	4,797	1,938	2,960	241	623	10,726
2005	682,540	69,323	191	4,307	1,947	2,784	58	694	9,981
2006	411,656	79,300	164	4,488	2,029	2,714	-232	606	9,768
2007	593,239	69,224	169	4,181	1,995	2,629	-281	632	9,325
2008	623,333	61,973	193	3,844	1,730	2,498	-400	708	8,573
2009	513,058	56,397	188	3,511	1,600	2,332	-420	683	7,893
2010	453,063	74,327	160	4,049	1,483	2,282	-643	592	7,923
2011	415,287	88,043	149	4,638	1,717	2,421	-671	595	8,849
2012	328,465	84,849	82	4,679	1,856	2,543	-548	454	9,066
2013	344,522	83,216	91	4,657	1,957	2,633	-497	252	9,092
2014	518,731	69,036	150	4,166	1,897	2,553	-413	556	8,908
2015	555,832	62,579	148	3,803	1,788	2,438	-467	548	8,260
2016	565,968	61,021	149	3,631	1,673	2,307	-532	556	7,784
2017	574,029	54,788	156	3,370	1,531	2,124	-582	606	7,205
2018	212,225	87,799	92	4,235	1,552	2,366	-705	567	8,108
2019	855,755	50,872	159	3,209	1,416	2,271	-488	619	7,185
2020	307,808	80,734	88	4,000	1,248	2,232	-619	545	7,494
2021	381,197	75,913	145	4,163	1,370	2,338	-456	536	8,096
2022	359,222	73,131	146	4,137	1,508	2,372	-507	547	8,203
2023	639,603	68,389	158	3,917	1,624	2,421	-524	575	8,171
2024			122	1,486	1,824	1,952	1,470	453	7,307
2025			110	753	1,294	1,392	1,066	406	5,020

2026			98	465	935	1,011	792	361	3,661
2027			85	290	686	746	614	312	2,732
2028			69	211	511	559	487	254	2,090
2029			57	107	383	422	392	209	1,570
2030			40	50	288	320	319	149	1,167
2031			25	6	220	247	260	92	851
2032			10	0	154	166	212	37	580
2033			0	0	127	137	153	0	418
2034			0	0	73	72	126	0	271
2035			0	0	38	38	81	0	157
2036			0	0	10	10	60	0	81
2037			0	0	0	0	34	0	34
2038			0	0	0	0	12	0	12
2039			0	0	0	0	0	0	0
2040			0	0	0	0	0	0	0
Avg 2001- 2015	430,291	72,833	135	4,124	1,658	2,420	-295	485	8,528
Avg 2001- 2010	429,256	70,692	140	4,004	1,574	2,375	-192	487	8,388
Post Plan			616	3,368	6,541	7,073	6,081	2,271	25,951

- a) Estimated net stream depletions shown in this table are greater than the stream depletions that potentially cause injury to surface water rights.

Explanation of Columns

- (1) Year
- (2) Conejos River near Mogote Gage streamflow in acre-feet for the NRCS streamflow forecast period of April through September. The streamflow value for 2023 was supplied as a preliminary number from DWR.
- (3) Net Groundwater Consumptive Use (NetGWCU) for January through December. NetGWCU values for 2001 through 2010 were taken from the RGDSS Groundwater Model output. NetGWCU values for 2011 through 2022 were calculated using well meter data. NetGWCU data for 2023 is calculated using preliminary actual meter data for 2023 and preliminary diversions based on the preliminary Conejos River streamflows from DWR.
- (4) Net Stream Depletions in the Conejos above Seledonia/Garcia reach for the Plan Year (May through April) in ac-ft.
- (5) Net Stream Depletions in the Conejos below Seledonia/Garcia reach for the Plan Year (May through April) in ac-ft.
- (6) Net Stream Depletions in the Rio Grande Del Norte to Excelsior Ditch reach for the Plan Year (May through April) in ac-ft.
- (7) Net Stream Depletions in the Rio Grande Excelsior Ditch to Chicago Ditch reach for the Plan Year (May through April) in ac-ft.
- (8) Net Stream Depletions in the Rio Grande Chicago Ditch to the State Line reach for the Plan Year (May through April) in ac-ft.
- (9) Net Stream Depletions in the Alamosa River for the Plan Year (May through April) in ac-ft.
- (10) Net Stream Depletions in the San Antonio River for the Plan Year (May through April) in ac-ft.
- (11) Total Net Stream Depletions columns (4 + 5 + 6 + 7 + 8 + 9 + 10) in ac-ft.

Table 2.3 is an output from the Response Functions that calculates the annual total stream depletions and monthly replacement obligations for the two reaches of the Conejos River, the Alamosa River, and the three reaches of the Rio Grande. This table lists the 2023 Year stream depletions as required under the Groundwater Rules.

As indicated in the lower right-hand corner of Table 2.3, the Response Functions calculated total stream depletions to the Conejos River, Alamosa River, and Rio Grande during the Plan Year due to both past and actual ARP Well groundwater withdrawals. The actual 2023 depletions from ARP Well groundwater withdrawals are **8,171.2 acre-feet**. The Response Function's calculated total stream depletions to the Conejos River are **4,075.2 acre-feet**, to the Alamosa

River **574.9 acre-feet**, and to the Rio Grande **3,521.1 acre-feet**. The locations of the stream depletions and monthly quantities are also tabulated in Table 2.3.

Table 2.3
Subdistrict No. 6 Monthly Stream Depletions for 2023 Plan Year
 (Units in acre-feet)

Alamosa/La Jara Response Area Total													
Stream Reach	2023								2024				Total
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Conejos above Seledonia/Garcia	14.3	20.5	20.4	17.3	14.8	14.5	12.2	11.8	8.4	7.4	8.3	8.7	158.4
Conejos below Seledonia/Garcia	248.7	352.6	460.0	490.9	450.0	395.1	317.3	293.1	265.9	221.1	224.5	197.7	3,916.8
Rio Grande Del Norte-Excelsior	117.7	119.6	121.2	127.3	140.8	150.0	137.8	144.4	151.5	137.0	148.6	127.7	1,623.6
Rio Grande Excelsior-Chicago	191.8	188.2	199.6	204.6	201.7	208.0	201.8	205.7	212.5	196.5	212.1	198.8	2,421.2
Rio Grande Chicago-State Line	13.1	-56.2	-123.9	-160.5	-93.2	-57.1	-37.2	5.3	-5.3	-7.3	18.9	-20.3	-523.7
Alamosa River	144.9	124.4	91.9	46.0	12.8	22.2	0.6	0.8	0.7	0.7	0.8	129.1	574.9
Total	730.5	749.3	769.1	725.5	726.8	732.7	632.5	661.1	633.8	555.2	613.2	641.6	8,171.2

Explanation of Columns

- (1) Stream reach
- (2) - (13) Monthly Stream Depletions in acre-feet
- (14) Total Plan Year Stream Depletions in acre-feet

According to the RGDSS Groundwater Model, if Subdistrict No. 6 ARP Wells were shut off today, there would be a continuing depletion to the river for approximately 19 years. This is the calculated time required to recover to conditions that existed before groundwater withdrawals started. The volume of water required to replace stream depletions during this recovery period is called Post-Plan Stream Depletions. Based on predictions from the Response Functions, Table 2.4 shows there would be a total of **25,951 acre-feet** of Post-Plan Stream Depletions. The portion of the total Post-Plan Stream Depletions impacting each of the six designated reaches of the rivers are also included in the table.

Table 2.4
Subdistrict No. 6 Post-Plan Stream Depletions
 (Units in acre-feet)

Years (May-Apr)	Conejos above Seledonia/Garcia	Conejos below Seledonia/Garcia	Rio Grande Del Norte-Excelsior	Rio Grande Excelsior-Chicago	Rio Grande Chicago-State Line	Alamosa River	Total
2024-2043	616	3,368	6,541	7,073	6,081	2,271	25,951

Table 2.5 below lists both the May 2023 projected stream depletions and the June 2024 final calculated obligations to compare projected versus actual calculated depletions for the 2023 Plan Year.

Table 2.5
Comparison of Subdistrict No. 6 2024 Projected and Calculated Stream Depletions
 (Units in acre-feet)

Month	Rio Grande									Alamosa River			Conejos River					
	Stream Reach 1			Stream Reach 2			Stream Reach 3			Stream Reach 1			Stream Reach 1			Stream Reach 2		
	4/15/2023	3/1/2024	7/1/2024	4/15/2023	3/1/2024	7/1/2024	4/15/2023	3/1/2024	7/1/2024	4/15/2023	3/1/2024	7/1/2024	4/15/2023	3/1/2024	7/1/2024	4/15/2023	3/1/2024	7/1/2024
May-23	119.2	117.7	117.7	193.2	191.8	191.8	15.7	13.1	13.1	141.2	144.9	144.9	14.0	14.3	14.3	235.0	248.7	248.7
Jun-23	118.9	119.6	119.6	187.5	188.2	188.2	-44.2	-56.2	-56.2	121.2	124.4	124.4	20.0	20.5	20.5	312.6	352.6	352.6
Jul-23	116.7	121.2	121.2	195.1	199.6	199.6	106.8	123.8	123.9	89.5	91.9	91.9	19.8	20.4	20.4	394	459.9	460.0
Aug-23	119.3	127.3	127.3	196.6	204.6	204.6	139.8	160.5	160.5	44.8	46.0	46.0	16.8	17.3	17.3	415.2	490.8	490.9
Sep-23	131.2	140.8	140.8	192	201.7	201.7	-77.5	-93.2	-93.2	12.4	12.8	12.8	14.4	14.8	14.8	380.2	449.9	450.0
Oct-23	139.3	150.0	150.0	197.3	208.0	208.0	-45.7	-57.1	-57.1	21.7	22.2	22.2	14.1	14.5	14.5	336.1	395.0	395.1
Nov-23	127.6	137.8	137.8	191.5	201.8	201.8	-35	-37.2	-37.2	0.5	0.6	0.6	11.8	12.2	12.2	273.1	317.3	317.3
Dec-23	134.4	144.0	144.4	195.6	205.7	205.7	2.9	5.3	5.3	0.8	0.8	0.8	11.5	11.8	11.8	254.3	293.1	293.1
Jan-24	139.1	151.5	151.5	200.1	212.5	212.5	-8.7	-5.3	-5.3	0.7	0.7	0.7	8.2	8.4	8.4	231.4	265.9	265.9
Feb-24	124.7	137.0	137.0	184.2	196.5	196.5	-11.5	-7.4	-7.3	0.7	0.7	0.7	7.2	7.4	7.4	193.2	221.1	221.1
Mar-24	135.1	148.6	148.6	198.6	212.1	212.1	12.9	18.9	18.9	0.8	0.8	0.8	8	8.3	8.3	196.9	224.5	224.5
Apr-24	115.1	127.7	127.7	186.2	198.8	198.8	-26.3	-20.3	-20.3	125.5	129.1	129.1	8.4	8.7	8.7	174	197.7	197.7
Total Projected 2023 Plan Year	1520.6			2317.9			-464.0			559.8			154.2			3396.0		
Preliminary 2023 Plan Year Calculated Total		1,623.5			2,421.3				-523.7		574.9			158.6				3,916.5
Actual 2023 Plan Year Total			1623.6			2421.2			-523.7		574.9			158.4				3,916.8

The Response Functions prepared for the 2023 ARP projected **7,484.2 ac-ft.** of combined stream depletions throughout the 2023 ARP year. A Preliminary Water Report, submitted to DWR the beginning of March 2024, recalculated depletions based on DWR’s preliminary end-of-year records for 2023 for both Subdistrict No. 6 ARP Wells 2023 groundwater withdrawals and 2023 surface water flows. With the March calculation, the total combined stream depletions increased to **8,170.8 ac-ft.** A final calculation of stream depletions was prepared for this Annual Report based on actual metered 2023 groundwater withdrawals as reported to DWR and the actual stream flows for 2023 based on DWR records. The actual total combined depletions for 2023 is **8,171.2 acre-feet.** Table 2.5 above shows these calculated amounts individually for comparison. The final Response Functions showed a slight change from the amounts calculated in the PWR. Appendix D includes a daily accounting of the amount and source of replacement to each calling right on the Rio Grande, Conejos and Alamosa rivers for the entire 2023 Plan Year.

Based on actual data, Subdistrict No. 6 calculates that at times during the 2023 Plan Year the Subdistrict may have over- or under-paid depletions at times to the Rio Grande, Conejos and Alamosa Rivers based on information provided in Appendix C showing the projected depletions paid daily by the Subdistrict for the 2023 Plan Year in comparison to the actual daily depletions calculated with actual 2023 data from DWR. The Subdistrict will work with DWR staff to determine the appropriate method for which to remedy any over/under paid injurious depletions as of the end of the 2023 Plan Year. Appendix D includes a daily accounting of the amount and source of replacement to calling rights on the Rio Grande, Conejos and Alamosa Rivers for the 2023 Plan Year.

3.0 OPERATION OF THE SUBDISTRICT NO. 6 2023 ANNUAL REPLACEMENT PLAN

All 2023 Plan Year injurious stream depletions were replaced in the time, location and amount that they occurred, beginning May 1, 2023. Releases of water were performed under the provisions of section 37-87-103, C.R.S.

Subdistrict No. 6's 2023 replacement operations on the Rio Grande included wet water releases from stored water the Subdistrict maintained in Beaver Reservoir or the Subdistrict utilized Forbearance Agreements with a number of ditches on the Rio Grande. The replacement sources used by the Subdistrict during the 2023 Plan Year were approved by the State Engineer or by the Division No. 3 Division Engineer for the 2023 Plan Year.

Subdistrict No. 6's 2023 replacement operations on the Alamosa River included wet water releases from Terrace Reservoir and included water stored from the Monte Vista Canal SWSP #9377. The Subdistrict also utilized its Taos Valley No. 3 "Depletion Bank Credits" to cover its injurious stream depletion obligations when the Rio Grande Compact was the calling right. When wet water was not being released, the Subdistrict utilized Forbearance Agreements with a number of ditches on the Alamosa River. An SWSP was filed for the use of the wet water replacement source and was approved before being used for depletion replacements during the 2023 Plan Year.

Subdistrict No. 6's 2023 replacement operations on the Conejos River included releases from water the Subdistrict had stored in Platoro Reservoir. The Subdistrict utilized leased water from the San Luis Valley Irrigation Well Owner's from their Taos Valley No. 3 water right on the San Antonio River. Taos Valley No. 3 water was approved to be use as a direct replacement in the stream when the right was on or it could also be sent to a depletion pool and used to offset injurious depletions through exchange when the Subdistrict had no forbearance and did not make a reservoir release. The Subdistrict also used forbearance agreements secured from a number of ditches on the Conejos system. The replacement sources used by the Subdistrict during the 2023 Plan Year were approved by the State Engineer or by the Division No. 3 Division Engineer for the 2023 Plan Year.

In total, **2,272.9 acre-feet** of wet water was added to the Rio Grande during the 2023 Plan Year with water acquired from Subdistrict No.'s 1 leases with owners of Santa Maria Reservoir Company shares, the San Luis Valley Irrigation Well Owner's from their Taos Valley No. 3

water right on the San Antonio River, and with Colorado Parks and Wildlife Tabor Ditch No. 2 water that was exchanged into the Subdistrict’s account in Rio Grande Reservoir and used under SWSP #7265. When the Subdistrict did not utilize wet water for its replacement source, forbearance was used. The Subdistrict remedied **1,092.7 acre-feet** of depletions under forbearance agreements the Subdistrict had secured for the irrigation season months of May 1, 2023-November 8, 2023 and April 2024. The Subdistrict’s allocation of Closed Basin Project production would have been sufficient to cover all the injurious depletions during the non-irrigation season but the production of the Closed Basin Project between January 1, 2024, and April 30, 2024, was insufficient to cover all of the depletions owed during this same period. The Subdistrict utilized **1,636.5 acre-feet** of the Subdistrict’s Closed Basin Project allocation to remedy injurious depletions during the non-irrigation season months of November 9, 2023-March 31, 2023. To remedy the remaining non-irrigation season depletions owed by the Subdistrict and not covered by the Closed Basin Project, a release was made from the Subdistrict’s stored water in Rio Grande Reservoir in the amount of **116.58 acre-feet** during April 2024. It should be noted that between October 19th and November 8th, 2023, due to the curtailment on the Rio Grande being set to zero, the accretions that occurred in Stream Reach 3 could not be aggregated with the depletions that occurred in Stream Reach 2 during this time period.

For replacement operations on the Conejos River, the Subdistrict released **1,418.9 acre-feet** of their leased Taos Valley No. 3 water rights for replacement of injurious depletions. When the Subdistrict did not utilize wet water for its replacement source, forbearance was used. The Subdistrict remedied **2,053.3 acre-feet** of depletions under forbearance agreements the Subdistrict had secured for the irrigation season months of May 1-November 1, 2023 and April 2024. A portion of the Subdistrict’s allocation of Closed Basin Project production in the amount of **1,359 acre-feet** was used to remedy all injurious depletions during the non-irrigation season months of November 2, 2023-March 31, 2024.

On the Alamosa River, the Subdistrict used both releases of stored water from Terrace Reservoir and forbearance agreements to remedy injurious stream depletions. During the 2023 Plan Year the Subdistrict released **47.7 acre-feet** of water from Terrace Reservoir. The Subdistrict utilized forbearance agreements held with a number of ditches for replacements when wet water was not being released. The Subdistrict used forbearance agreements to remedy a total of **504.3 acre-feet**. The Subdistrict was not required to replace any depletions to the Alamosa River during the non-irrigation season from November 2, 2023 to March 31, 2024.

Appendix D shows the calling water rights, as identified by the daily District 20, 21 and 22 call sheets, and the daily replacement source used to remedy the injurious stream depletions to those calling rights during the 2023 Plan Year for the Rio Grande, Conejos and Alamosa Rivers.

Table 3.1
Monthly Stream Depletions by Stream Reach for the 2023 ARP
and Replacement Sources Used to Remedy the Depletions
 (Units in acre-feet)

Rio Grande River												
Stream Reach Depletions	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23*	Nov-23*	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24

SR-1	119.2	118.9	116.7	119.3	131.2	139.3	137.8	144.4	151.5	137.0	148.6	127.7
SR-2	193.2	187.5	195.1	196.6	192.0	197.3	201.8	205.7	212.5	196.5	212.1	198.8
SR-3	15.7	-44.2	-106.8	-139.8	-77.5	-45.7	-37.2	5.3	-5.3	-7.4	18.9	-20.3
Total Depletions	328.1	262.2	205.0	176.1	245.7	290.9	302.4	355.4	358.7	326.1	379.6	306.1

Replacement Sources	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23*	Nov-23*	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
SR-1												
Taos Valley No. 3 SWSP	0.000	0.000	13.463	29.135	33.595	85.386	8.510	0.000	0.000	0.000	0.000	38.304
Subdistrict No. 1 Leased SMRC Water	34.614	15.852	0.000	0.000	0.000	4.494	0.000	0.000	0.000	0.000	0.000	8.512
Taos Valley No. 3 Depletion Credits	30.768	47.556	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CPW Tabor D#2, SWSP 7265	0.000	3.963	17.301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	53.844	51.519	85.982	90.184	97.625	49.434	25.530	0.000	0.000	0.000	0.000	80.864
CBP Allocation	0.000	0.000	0.000	0.000	0.000	0.000	101.090	144.429	151.466	136.967	148.614	0.000
SR-2												
Taos Valley No. 3 SWSP	0.000	0.000	25.172	48.023	50.199	120.935	12.768	0.000	0.000	0.000	0.000	59.652
Subdistrict No. 1 Leased SMRC Water	56.097	24.996	0.000	0.000	0.000	6.365	0.000	0.000	0.000	0.000	0.000	13.256
Taos Valley No. 3 Depletion Credits	49.864	74.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CPW Tabor D#2, SWSP 7265	0.000	6.249	26.236	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	87.262	81.237	143.675	148.610	141.801	70.015	38.304	0.000	0.000	0.000	0.000	125.932
CBP Allocation	0.000	0.000	0.000	0.000	0.000	0.000	147.972	205.716	212.505	196.504	212.102	0.000
SR-3												
Taos Valley No. 3 SWSP	0.000	0.000	-13.780	-34.146	-19.388	-13.275	0.000	0.000	0.000	0.000	0.000	-6.093
Subdistrict No. 1 Leased SMRC Water	4.563	-5.884	0.000	0.000	0.000	-1.475	0.000	0.000	0.000	0.000	0.000	-1.354
Taos Valley No. 3 Depletion Credits	4.056	-17.652	0.000	0.000	0.000	0.000	0.000	5.301	0.000	0.000	0.000	0.000
CPW Tabor D#2, SWSP 7265	0.000	-1.471	-14.364	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	7.098	-19.123	-78.651	105.664	-58.072	-11.800	0.000	0.000	0.000	0.000	0.000	-12.863
CBP Allocation	0.000	0.000	0.000	0.000	0.000	0.000	-27.258	0.000	-5.270	-7.337	18.972	0.000
Totals Replacements	328.166	262.230	205.034	176.142	245.760	310.079	306.916	355.446	358.701	326.134	379.688	306.210

*Negative Stream Reach 3 depletions were aggregated, or combined, with positive Stream Rach 2 depletions during 2023 Plan Year EXCEPT between October 19 – November 8.

Alamosa River												
Stream Reach Depletions	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
SR-1	141.2	121.2	89.5	44.8	12.4	21.7	0.6	0.8	0.7	0.7	0.8	129.1
Total Depletions	141.2	121.2	89.5	44.8	12.4	21.7	0.6	0.8	0.7	0.7	0.8	129.1

Replacement Sources	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
SR-1												
Monte Vista Canal SWSP 9377	9.110	20.205	1.640	15.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.813
Taos Valley No. 3 Depletion Credits	0.000	8.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	132.095	92.943	87.888	28.920	12.450	21.700	0.018	0.000	0.000	0.000	0.000	128.307

Totals Replacements	141.205	121.230	89.528	44.826	12.450	21.700	0.018	0.000	0.000	0.000	0.000	129.120
---------------------	---------	---------	--------	--------	--------	--------	-------	-------	-------	-------	-------	---------

Conejos River												
Stream Reach Depletions	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
SR-1	14.0	20.0	19.8	16.8	14.4	14.1	12.2	11.8	8.4	7.4	8.3	8.7
SR-2	235.0	312.6	394.0	415.2	380.2	336.1	317.3	293.1	265.9	221.1	224.5	197.7
Total Depletions	249.0	332.6	413.9	432.0	394.5	350.2	329.5	304.9	274.3	228.4	232.7	206.3

Replacement Sources	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
SR-1												
Taos Valley No. 3 SWSP	0.000	0.000	1.548	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.156
Taos Valley No. 3 Depletion Credits	7.216	8.004	0.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	6.765	12.006	17.652	16.833	14.400	14.105	0.395	0.000	0.000	0.000	0.000	7.514
CBP Allocation	0.000	0.000	0.000	0.000	0.000	0.000	11.774	11.780	8.463	7.395	8.277	0.000
SR-2												
Taos Valley No. 3 SWSP	0.000	0.000	30.760	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.356
Taos Valley No. 3 Depletion Credits	121.296	125.028	12.711	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forbearance	113.715	187.542	350.570	415.183	380.160	336.071	9.103	0.000	0.000	0.000	0.000	171.314
CBP Allocation	0.000	0.000	0.000	0.000	0.000	0.000	306.733	293.136	265.887	221.096	224.502	0.000
Totals Replacements	248.992	332.580	413.881	432.016	394.560	350.176	328.005	304.916	274.350	228.491	232.779	206.340

4.0 DOCUMENTATION OF PROGRESS TOWARDS ACHIEVING AND MAINTAINING A SUSTAINABLE WATER SUPPLY

Rule 8.1.7 of the Groundwater Rules includes provisions for meeting the requirements for achieving and maintaining a Sustainable Water Supply in the confined aquifer. Per the State Engineer’s approval letter for the PWM, dated September 25th, 2019, the Alamosa-La Jara Response Area five-year running average groundwater withdrawals were below the 1978-2000 average groundwater withdrawals for the Alamosa-La Jara Response Area with a five-year average of **91,903 acre-feet** (for the period 2014-2018). Per the July 1, 2023, memo from the State Engineer, “Five Year Groundwater Withdrawals in Confined Aquifer Response Area in Division 3: July 2023 Requirement of Division 3 Groundwater Rules Section 8.1.5,” the 2018-2022 five-year average groundwater withdrawals for the Alamosa-La Jara Response Area was **97,957 acre-feet**. It is anticipated that the five-year average will decrease when the 2018 withdrawals of **116,066 acre-feet** are removed and the lower withdrawals for 2023 are included. On the Rio Grande River, 2023 was an above-average year and, therefore, it is anticipated the State Engineer’s next calculation of the Alamosa-La Jara Response Area five-year average will decrease by approximately **4,660 acre-feet** based on the trend in the Subdistrict.

The five-year running average groundwater withdrawals for 2023 ARP Wells for the period 2019-2023 is **93,298 acre-feet**. The previous five-year running average from 2018-2022 for 2023

ARP wells, including contract wells, was **98,180 acre-feet**. Based on the trends of both the Alamosa-La Jara Response Area and the Subdistrict's five-year average, the Subdistrict will remain in compliance with the Sustainable Water Supply Requirement of the Rules.

5.0 ADDITIONAL INFORMATION TO EVALUATE 2023 ARP

The Subdistrict will provide the DWR with an electronic copy of the Response Functions used in this Annual Report at the same time they submit the Annual Report for review and approval. Additional supplemental information that is generally used by DWR in their evaluation of the Annual Report is also being included with the submission. The supplemental information being provided includes:

1. The list of Subdistrict Wells and the 2023 actual metered groundwater withdrawals for the ARP Wells included in the 2023 ARP in spreadsheet format matching the list provided in Appendix A.
2. Spreadsheet of the breakdown of "sprinkler", "flood" and "other" wells used to calculate the Consumptive Use Ratio in the Response Functions.