Appendix D.3 - Surface Water Hydrology Daily Model Documentation

Introduction

Appendix D.3 presents development of the Arkansas River daily simulation model (Daily Model). The Daily Model is an extension of the model used to analyze hydrologic effects in the Southern Delivery System Environmental Impact Statement. This appendix supplements the Hydrologic Model Documentation Report produced for the Southern Delivery System EIS, and related documents on the original development, operation and calibration of the Southern Delivery System EIS model (MWH 2008a; MWH 2008b).

This appendix primarily discusses information that has been added to or modified from the Southern Delivery System EIS version of the model, including extension of the Daily Model study period and adjustment of certain model constructs and parameters to accommodate additional data. Information that has not changed since the Southern Delivery System EIS version is not repeated herein, but incorporated as a reference. Calibration and verification results of the Daily Model are also included in this document. Implementation of AVC EIS alternatives in the Daily Model is discussed in Appendix D.4.

Purpose of Model

The Daily Model is designed to investigate operations and effects of proposed water development projects within the Arkansas River Basin that are being investigated as part of the AVC EIS. The Daily Model has the ability to:

- Determine operational feasibility of alternatives
- Determine spatial extent of the hydrological affected environment
- Develop simulated time-series hydrology at specific streamflow locations and reservoirs to allow comparison of each alternative's effects on streamflow and reservoir contents

Model output will be used to develop other physical properties of flows at selected points, including flow depth, velocity, and wetted perimeter. Daily Model output are also used by other resources, including water quality, groundwater hydrology, and aquatic life, to develop hydrologic data sets for use in modeling specific to those resources.

The Daily Model is intended to analyze hydrologic effects of the alternatives. It is not intended to, nor is it used to, analyze yields of the alternatives. A yield analysis for the Fry-Ark project is described in Appendix D.2.

Model Area

The Daily Model area is defined by both the location of physical project facilities and the effects of modified river basin operations on streamflow and reservoir levels. As a result, the Daily Model area may encompass areas that are not necessarily covered by all other resource study areas. The following describes the hydrologic characteristics of the EIS alternatives and the resulting model area description.

Hydrologic Discussion of Alternatives

As proposed, the AVC would deliver water from the existing Pueblo Reservoir south outlet works via the Joint Use Manifold or Joint Use Pipeline, or via a river intake downstream from the St. Charles Mesa Water District intake. The AVC would convey water to various municipal water users along the Arkansas River to a terminal point near Lamar. A spur pipeline would serve Eads, CO. A new water treatment plant would be built near Pueblo, with location and type of treatment depending on the alternative. The AVC may affect streamflow on the Arkansas River and reservoir contents at and downstream from Pueblo Reservoir as it diverts water supply currently conveyed in the river. The AVC may also affect streamflow and reservoir contents upstream from Pueblo Reservoir (including Western Slope diversions) via changes in Fry-Ark operations and other non-Fry-Ark Project water supplies.

The Master Contract would allow participants to store approximately 30,000 ac-ft of water in Pueblo Reservoir. This water would be delivered to Master Contract participants using the AVC or other existing systems, exchanged upstream, or released to the Arkansas River, depending on participants' needs. Water supplies for the Master Contract are varied and originate both upstream and downstream from Pueblo Reservoir, including Fountain Creek. Water supplies must be diverted to or exchanged up to Pueblo Reservoir for storage. The Master Contract may affect streamflow quantity and timing in the Arkansas River and Fountain Creek through diversions and exchanges to storage, and releases from storage, as well as reservoir storage contents primarily in Pueblo Reservoir.

The Interconnect is a short section of pipeline that would convey water between the existing south outlet works and future north outlet works at Pueblo Reservoir during temporary maintenance and emergency outages. Based on expected operations, the Interconnect is not anticipated to have hydrologic effects on streamflow and reservoir contents in the model area. It is included in the Daily Model, but not operated under normal conditions.

All alternatives are hydrologically unique based on the inclusion or non-inclusion of the Master Contract, operational differences in the AVC Fry-Ark carryover account, and differences in intake and water treatment locations. Both the Comanche South alternative and the Pueblo Dam North alternative include AVC diversion from Pueblo Dam, Master Contract account and full use of the AVC Fry-Ark carryover storage account. The Pueblo Dam South alternative is identical to these alternatives except that it assumes only partial use of the AVC Fry-Ark carryover storage account, thus effects of these modified operations will be analyzed. The Joint Use Pipeline North Alternative includes AVC from Pueblo Dam, but does not include the Master Contract action, thus the alternative will isolate effects of the AVC. The River South Alternative has an AVC intake location downstream from Pueblo Reservoir; as a result streamflow in the Arkansas River between Pueblo Dam and the intake is expected to be higher than other alternatives. The Master Contract Only Alternative does not include the AVC, and its hydrological effects will be associated with conveying AVC water supplies in the Arkansas River.

Alternatives will be compared to a No Action alternative. The No Action Alternative is what could be reasonably expected to occur if the Proposed Action does not take place. If the AVC project is not implemented, AVC participants would likely meet water supply and water quality needs with a combination of regional water treatment systems and local independent systems. Hydrological effects may differ from other alternatives due to increase alluvial pumping and conveyance of supplies in the river. In the absence of a Master Contract for long-term storage of water in Pueblo Reservoir, Master Contract participants indicated that they would continue current operations without storage, or continue applying or apply for new temporary excess capacity contracts. The Interconnect would not be constructed under the No Action Alternative.

Daily Model Area

The Daily Model area is from the Arkansas River headwaters (Arkansas River at Leadville gage) downstream to the Arkansas River at Las Animas gage, Fountain Creek from the 33rd Street intake (Fountain Creek near Colorado Springs gage) to its confluence with the Arkansas River, and Monument Creek from the Monument Creek at Palmer Lake gage to its confluence with Fountain Creek. The AVC study area is similar, but begins at the Fountain Creek at Security gage on Fountain Creek, and also includes analysis areas on the Western Slope and downstream from the Arkansas River at Las Animas gage through Lamar. Grape Creek in Custer County is also included in the AVC model area, but is not included in the Daily Model area. Figure 1 shows differences in the AVC EIS study area and the Daily Model area. The model area is shown in shades of blue. The light blue portion reflects the part of the Daily Model not included in the AVC EIS study area. Purple and green colors reflect analysis areas not in the Daily Model, and these areas are not discussed further in this document.

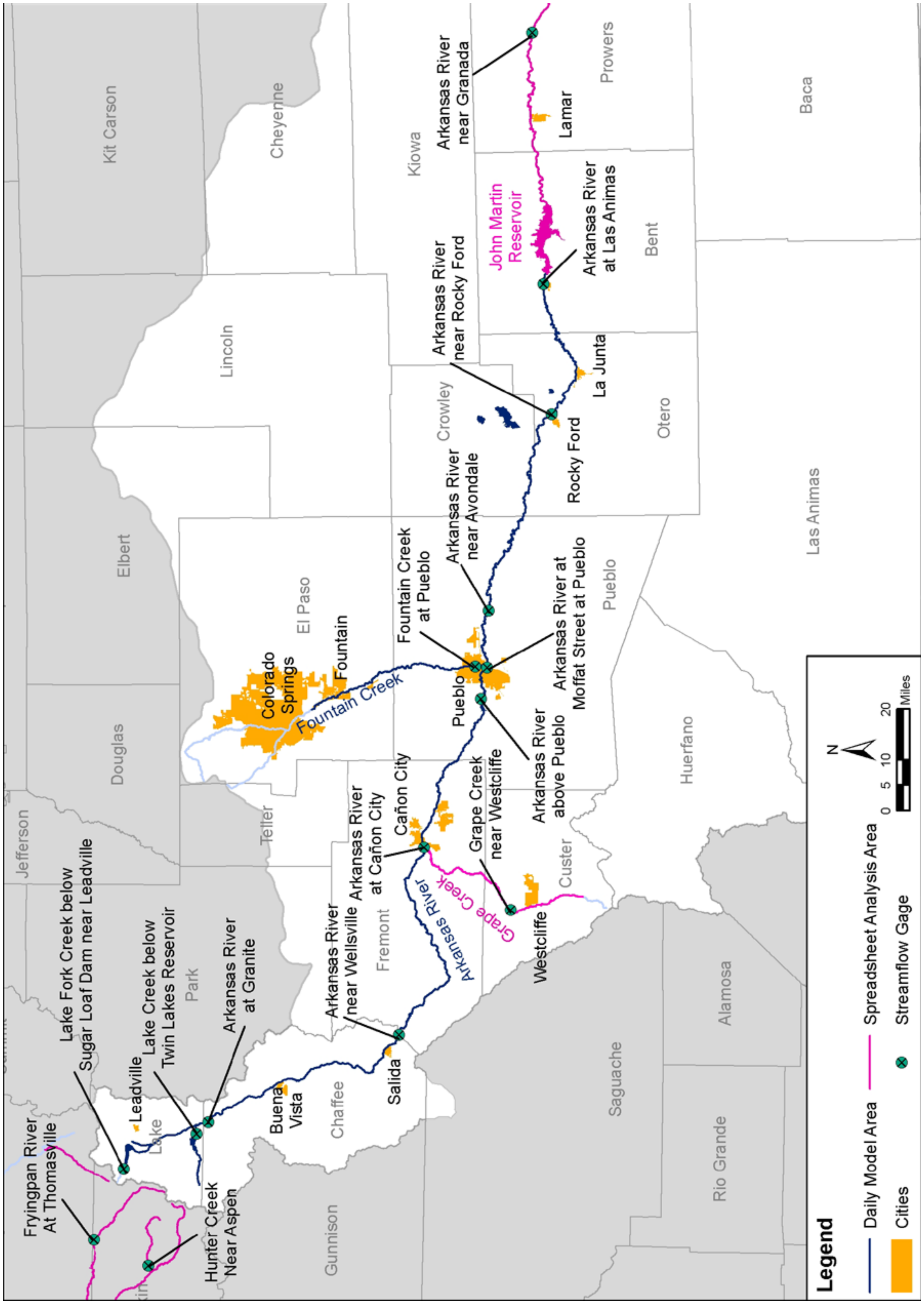

Figure 1. Arkansas Valley Conduit Environmental Impact Statement Study Area and Daily Model Area

Model Description

The Daily Model is a hydrologic river and reservoir operations model that simulates historical conditions, existing conditions, and potential future conditions within the Arkansas River Basin. The Daily Model simulates these conditions on daily time-series hydrology over a number of years. Inflows to the Daily Model include native flows from the Arkansas River and its tributaries, transmountain imports, and ungaged inflows within reaches along the river. Diversions from the river are simulated for all major municipal and agricultural diversions, and are made according to their water right priorities. The Daily Model also includes all major storage facilities in the basin, including Fry-Ark Project facilities, Colorado Canal storage facilities, and other reservoirs that provide water supplies to diversions simulated in the model.

The Daily Model uses a generalized network flow software called MODSIM developed by Colorado State University and Reclamation (Labadie, et al. 2000). The Daily Model uses a general “link-node” construction that when viewed with MODSIM’s graphical user’s interface (graphical user interface), matches the river basin’s general layout. The Daily Model was verified and calibrated using historical river basin data. Data for the Daily Model was primarily obtained from the state’s Colorado Division of Water Resources’ Hydrobase database, the Division Engineer’s Office, and Reclamation. Municipal demand data were obtained from municipal entities themselves and through basin planning studies by the Southeastern Colorado Water Conservancy District (Southeastern).

The Daily Model was constructed to simulate operations of the AVC EIS and various alternatives, the No Action Alternative, and other reasonably foreseeable actions that would have hydrologic effects in the cumulative effects scenarios. This includes simulating not only physical infrastructure included as part of each alternative, but also water rights and operations for each alternative. The Daily Model uses a daily time-step and includes enough nodes to adequately describe flow within the river, and to perform exchange calculations within the river. The Daily Model does not explicitly simulate groundwater within the basin.

Except as described in the remainder of this document, all general model settings, deterministic and static variables, explicit and implicit model variables, and terminology and output are the same as that for the Southern Delivery System EIS, and can be further reviewed in Section 3 of the Southern Delivery System EIS Model Documentation Report (MWH 2008a).

Model Data

Accurate and comprehensive model data are important to the overall success of the Daily Model. This section describes the study period, spatial extent of required data, data sources, and supplemental data calculations.

Hydrologic Study Period

The Daily Model superimposes existing and future conditions on historical hydrology. Selection of the hydrologic period is therefore an important model criterion. The selected study period would ideally be the entire period-of-record for the basin, which in the Arkansas River Basin is approximately 110 years. However, data are only available at a few selected sites for this entire record, and computational time requirements for this length of simulation using a daily time step would be extensive. It is common practice to run models on a representative data set that generally has the same general statistical makeup of the entire data population.

Selection of Study Period

A study period of water years 1982 through 2009 was selected for the hydrologic analyses. The Daily Model would ideally be able to simulate any period-of-record, and for the most part, is constructed to do so. However, a few assumptions made in the model construction, primarily constant flow routing, are dependent upon flow regimes in the river being somewhat consistent with historical hydrology. Therefore, the shorter study period produces more reliable model results. Additional information regarding selection of the study period is contained in Appendix D.1.

Hydrologic Year Classification

Hydrologic year classification is the designation of each year as either a dry year, normal (average) year, or wet year. This classification is used in the model to administer flow programs and to make other miscellaneous decisions regarding system operations as described within various sections of the documentation. To be consistent with other definitions of classifications currently being used, especially in relationship to on-going flow program development through the city of Pueblo, the hydrologic year classification was based upon the Natural Resources Conservation Service's Colorado Basin Water Supply Outlook Report "most probable" forecast (50 percent chance of exceedence) as of the first day of the month for flows at the Arkansas River at Salida gage. The most probable flow forecast is the Natural Resource Conservation Service estimate of actual runoff in the season given current hydrometeorological conditions to date (Natural Resource Conservation Service 2005). Forecasts for the Arkansas River at Salida gage are for natural flows (Natural Resource Conservation Service 2011). Therefore, most probable flows at the Arkansas River at Salida gage do not include anticipated transmountain imports into the basin or anticipated diversions through the Otero Pump Station.

For each year in the simulation, the hydrologic classification was based on the last most probable forecast for the year (prior to 1986 the latest estimation was made at the beginning of May and after 1986 the latest estimation is made at the beginning of June). The most probable flow forecasts were ranked from smallest to largest and the probability for any of these flows not being exceeded over a population of discharges was then characterized as follows:

Equation 1

$$P_i = \frac{n_i}{N+1}$$

where: n = rank of discharge for year i
N = Number of years in sample
P = Probability that the discharge in year i will not be exceeded

Once the ranking is performed, each year is classified based on its non-exceedence probability, as follows:

Dry: $P_i < 0.3$
Average: $0.3 \le P_i \le 0.7$
Wet: $P_i > 0.7$

Table 1 shows the non-exceedence probability and classification of the hydrologic years.

Table 1 Classification of Hydrologic Years for Most Probable Flow at Salida

Water Year	Salida Most Probable Flow (% of Average)	Rank (n_i)	Non-Exceedence Probability (P_i)	Hydrologic Classification
1982	115	33	0.733	Wet
1983	108	31	0.689	Avg
1984	150	42	0.933	Wet
1985	103	28	0.622	Avg
1986	117	34	0.756	Wet
1987	94	24	0.533	Avg
1988	77	9	0.200	Dry
1989	63	5	0.111	Dry
1990	74	7	0.156	Dry
1991	85	15	0.333	Avg
1992	79	12	0.267	Avg
1993	111	32	0.711	Wet
1994	89	18	0.400	Avg
1995	185	44	0.978	Wet
1996	138	39	0.867	Wet
1997	135	38	0.844	Wet
1998	86	16	0.356	Avg
1999	95	25	0.556	Avg
2000	77	9	0.200	Dry
2001	83	14	0.311	Avg
2002	25	1	0.022	Dry
2003	89	18	0.400	Avg
2004	79	11	0.244	Dry
2005	90	21	0.467	Avg
2006	87	17	0.378	Avg
2007	81	13	0.289	Dry
2008	145	41	0.911	Wet
2009	107	30	0.667	Avg
Dry	83	13.2	0.300	Dry
Average	97			Avg
Wet	108	30.8	0.700	Wet

Notes:

(1) To provide a longer period-of-record for the dry-average-wet year determination, the actual analysis was developed based on 1966-2009 data. Only the model study period is shown in this table. This also causes the average not to be exactly 100 percent.

(2) 1992 and 2004 tied at 79 percent. 1992 set as average year and 2004 as dry year because actual flow at the Arkansas River at Salida gage for 1992 was higher than 2004.

Streamflow Data

All streamflow data were updated through 2009 and are housed in a Microsoft Access® database. A thorough Quality Assurance/Quality Control process was conducted for all database data. Descriptions of gage locations and information regarding stage-discharge relationships in the Arkansas River and Fountain Creek watersheds can be found in the AVC EIS website at http://www.usbr.gov/avceis. Graphs and tables depicting historical average monthly discharge and stage, average daily discharge and stage, and photos of the river/water body at different volumes can also be found at the website. Streamflow data used in the Daily Model are also described in Chapter 3 of the AVC EIS, and in the Southern Delivery System Model Documentation Report.

Diversion Data

Demands within MODSIM are populated with either historical diversion data or estimated future diversion data. All data were updated through 2009 and are housed in an Access database developed for the EIS. A thorough Quality Assurance/Quality Control process was conducted for all database data. For calibration, the Daily Model uses historical diversion data for all diversions. For existing and future scenario simulations, the Daily Model uses historical diversion data for most agricultural diversions and smaller municipal diversions, and existing and estimated future diversions for larger municipal diversions. In addition, calculation of historical ungaged gains and losses use historical demands. All diversion data are available on a daily time-step. Diversion data used in the Daily Model are also described in Chapter 3 of the AVC EIS, and in the Southern Delivery System Model Documentation Report.

Historical Storage Data

Historical storage data were primarily required for historical gain/loss calculations and model calibration. Seven existing reservoirs and their associated accounts are explicitly simulated, while one reservoir (Holbrook Reservoir) is partially explicitly and partially implicitly simulated. Descriptions of reservoirs in the Arkansas River watershed can be found on the AVC EIS website. Reservoir data used in the Daily Model are also described in Chapter 3 of the AVC EIS, and in the Southern Delivery System Model Documentation Report.

Water Rights Data

Water rights data are an integral part of the partially deterministic Daily Model. The amount of water diverted from the river for each demand node is defined by the historical diversion and/or calculated future demand. However, the diversion is constrained by water rights links developed for MODSIM. These links must accurately reflect water rights, storage ownership, and transmountain water ownership of the demand. Appendix A describes water rights for the AVC Master Contract participants.

Data Estimation

Most data sets in the Arkansas River Basin have nearly complete records. However, there are locations where data at existing gaging locations needs to be filled or extended, or data at ungaged locations needs to be estimated. These two data estimation requirements are further discussed in the Southern Delivery System Model Documentation Report.

Ungaged Gains and Losses

As discussed in previous sections, ungaged gains and losses were calculated outside of the Daily Model and then input as a constant value through the reach for each day. Ungaged gains and losses were calculated using the ArkExcel Microsoft Excel® spreadsheet model. This model calculates "ungaged," or more realistically, unknown, gains and losses within reaches in the model based upon differences between known inflows to the reach, diversions from the reach, and the upstream and downstream gages defining the reach. The ungaged reach gain/loss is then pro-rated to each node within the reach based upon distance between the nodes. Full documentation of the ArkExcel model can be found in the Southern Delivery System Model Documentation Report.

Adjustments were made to gains and losses within the Fountain Creek and Monument Creek basins to account for anticipated future increases in ungaged gains and losses within the watersheds. Details of adjustment methods are presented in a separate technical memorandum for the Southern Delivery System EIS. A summary of average annual gain/loss adjustments for existing conditions (2010) and future conditions (2070) for both direct effects and cumulative effects is presented in Table 2, Table 3, and Table 4. Details on integration of these data into the Daily Model are presented in the Southern Delivery System Daily Model Documentation.

Table 2. Annual Gain and Loss Adjustment - Existing Conditions (2010)

Water Year	Total Annual Gain and Loss Adjustment (ac-ft)					Percent Change from Historical Gain and Loss
	Palmer Lake to Pikeview	Pikeview/33rd St. to Nevada Av.	Nevada Av. to Security	Security to Fountain	Total	
1982	1,642	-	4,977	-	6,619	10
1983	1,766	-	3,418	-	5,184	6
1984	1,182	-	4,900	-	6,081	7
1985	874	-	2,062	-	2,936	3
1986	1,070	-	3,827	-	4,897	15
1987	1,062	-	2,662	-	3,723	5
1988	953	-	1,921	-	2,874	7
1989	1,324	-	2,502	-	3,826	12
1990	898	-	3,377	-	4,275	8
1991	1,027	-	2,604	-	3,631	8
1992	861	-	1,671	-	2,532	6
1993	858	-	2,104	-	2,963	10
1994	882	-	2,791	-	3,673	7
1995	898	-	2,214	-	3,112	3
1996	890	-	1,814	-	2,703	5
1997	870	-	2,593	-	3,463	3
1998	658	-	1,272	-	1,930	3
1999	557	-	2,166	-	2,723	1
2000	436	-	1,312	-	1,748	2
2001	364	-	1,040	-	1,405	2
2002	204	-	681	-	885	2
2003	410	-	683	-	1,093	2
2004	311	-	903	-	1,214	2
2005	215	-	459	-	674	2
2006	232	-	434	-	667	2
2007	131	-	299	-	430	1
2008	98	-	224	-	323	1
2009	48	-	118	-	165	1
Avg(ac-ft)	740	-	1,965	-	2,705	4
Avg(cfs)	1.0	-	2.7	-	3.7	4

Table 3. Annual Gain and Loss Adjustment - Future Conditions Direct Effects (2070)

Water Year	Total Annual Gain and Loss Adjustment (ac-ft) Palmer Lake to Pikeview	Pikeview/33rd St. to Nevada Av.	Nevada Av. to Security	Security to Fountain	Total	Percent Change from Historical Gain and Loss
1982	1,997	34	2,829	1,338	6,199	9
1983	1,929	31	2,014	2,016	5,990	7
1984	1,289	50	2,771	1,634	5,744	7
1985	1,188	41	1,267	1,598	4,093	4
1986	1,726	47	2,235	1,749	5,758	17
1987	1,081	32	1,556	1,693	4,363	5
1988	1,332	28	1,230	1,163	3,753	9
1989	1,690	36	1,532	1,522	4,780	15
1990	1,284	54	2,214	1,717	5,269	10
1991	1,397	29	1,609	1,867	4,901	11
1992	1,309	35	1,106	1,544	3,995	9
1993	1,464	45	1,442	1,293	4,243	14
1994	1,617	42	1,916	2,330	5,905	11
1995	1,426	40	1,516	1,701	4,682	4
1996	1,602	41	1,294	2,118	5,056	9
1997	1,613	53	1,963	2,060	5,689	5
1998	1,576	41	950	1,995	4,561	7
1999	1,290	48	1,704	1,929	4,971	2
2000	1,309	44	1,058	1,801	4,213	6
2001	779	28	917	1,256	2,979	4
2002	651	26	713	981	2,371	6
2003	1,384	37	709	1,561	3,692	8
2004	932	37	1,028	1,673	3,669	6
2005	937	31	557	1,491	3,016	11
2006	1,279	36	674	1,567	3,556	8
2007	704	32	584	1,324	2,644	4
2008	1,027	40	600	1,384	3,051	10
2009	749	25	560	1,573	2,906	10
Avg (ac-ft)	1,306	38	1,377	1,638	4,359	7
Avg (cfs)	1.8	0.1	1.9	2.3	6.0	7

Table 4. Annual Gain and Loss Adjustment - Future Conditions Cumulative Effects (2070)

Water Year	Total Annual Gain and Loss Adjustment (ac-ft)					Percent Change from Historical Gain and Loss
	Palmer Lake to Pikeview	Pikeview/33rd St. to Nevada Av.	Nevada Av. to Security	Security to Fountain	Total	
1982	4,755	81	6,736	3,186	14,759	22
1983	4,592	73	4,795	4,801	14,261	16
1984	3,070	118	6,596	3,892	13,677	16
1985	2,829	97	3,016	3,804	9,746	10
1986	4,110	112	5,322	4,165	13,709	41
1987	2,573	77	3,706	4,032	10,388	13
1988	3,172	66	2,930	2,768	8,936	21
1989	4,025	86	3,648	3,623	11,381	35
1990	3,058	129	5,272	4,087	12,546	24
1991	3,326	68	3,831	4,445	11,669	26
1992	3,117	84	2,634	3,677	9,511	23
1993	3,485	106	3,434	3,078	10,103	33
1994	3,850	100	4,563	5,548	14,061	27
1995	3,394	95	3,609	4,050	11,148	10
1996	3,815	98	3,080	5,044	12,038	21
1997	3,840	126	4,675	4,904	13,545	13
1998	3,752	98	2,261	4,749	10,860	16
1999	3,072	114	4,058	4,592	11,836	6
2000	3,118	106	2,519	4,289	10,032	13
2001	1,854	67	2,183	2,990	7,093	9
2002	1,549	62	1,698	2,335	5,645	15
2003	3,296	89	1,687	3,718	8,790	19
2004	2,218	87	2,448	3,983	8,737	15
2005	2,232	74	1,326	3,550	7,182	27
2006	3,045	86	1,605	3,731	8,467	20
2007	1,676	77	1,391	3,152	6,295	10
2008	2,445	95	1,429	3,295	7,265	24
2009	1,783	59	1,333	3,744	6,919	25
Avg (ac-ft)	3,109	90	3,278	3,901	10,378	16
Avg (cfs)	4.3	0.1	4.5	5.4	14.3	16

River Basin Operations

This section addresses underlying assumptions made in the model for simulating general river and reservoir operations and the alternatives. For purposes of this document, these assumptions are referred to as “existing” and “future” conditions. These assumptions address how river and reservoir operations were assumed to operate in the model independently of the alternatives, and are based on previous documentation, knowledge of historical and current operations and discussions with others regarding the project. The following sub-sections describe assumptions specific to the Daily Model. Additional information can be found in the Southern Delivery System Model Documentation Report.

Specific variable settings for existing conditions, direct effects and cumulative effects model runs are contained in Appendix D.4. In general, existing conditions refer to current (2010) river operations, including levels of demand, infrastructure in place, exchanges, and operations. These conditions differ from historical conditions in that historical conditions have changed over time, while existing conditions are a “snapshot” of today’s operations on the river. The variables used to construct the existing conditions run primarily consist of municipal demands, the availability and size of existing and proposed infrastructure, use of Excess Capacity storage accounts in Pueblo Reservoir, and the status and use of change cases. Future conditions pertain to direct effects and cumulative effects model runs. River and operating conditions generally represent the expected conditions at the end of the 50-year repayment period (AVC) and 40-year contracts (Interconnect and Master Contract) being analyzed by the EIS. Therefore, the AVC Daily model was constructed to analyze effects of the AVC repayment and conveyance contract through 2070 and the Interconnect and Master Contract period through 2060.

Water Use

Water uses within the Arkansas River Basin include agricultural, municipal, industrial, recreation, fisheries, and augmentation (Colorado Water Conservation Board 2002). Irrigation is the single largest use of water within the Arkansas River Basin, followed by municipal and industrial use. Because irrigation and municipal uses are the primary consumptive uses, and because other water uses will be covered by other resource areas, only irrigation and municipal uses are further discussed in this document.

Many agricultural diversions in the Arkansas River Basin have at least some ownership of shares by municipal and industrial entities. Diversion data used in the Daily Model are also described in Chapter 3 of the AVC EIS, and in the Southern Delivery System Model Documentation Report.

Agricultural Demands

Agricultural use, mostly crop irrigation, is the major water use in the model area. Chapter 3 of the AVC EIS and the Southern Delivery System Model Documentation Report contain additional details on the agricultural setting of the model area.

In the Daily Model, agricultural demands are defined as headgate diversion requirements. For purposes of the Daily Model, except for those specific systems identified in further sub-sections that are primarily owned by municipal entities, it is assumed that future demands of water by agricultural entities will be the same as their historical diversions. Although demands were likely higher than actual diversions for many of the drier years, this approach provides a consistent comparison with historical and existing irrigation practices and production. Demands may also vary based upon changing irrigation practices within the basin. However, because changes in irrigation practices do not necessarily result in changes in crop consumptive use, no modifications were made to the historical diversion data sets to reflect potential changes in agricultural diversion requirements. This is considered a conservative assumption, in that it limits availability of water for junior water rights, and uses a higher amount of water from storage.

Municipal and Industrial Demands

The next highest diversion category of water use, other than water diverted for storage, is municipal use. The two largest municipal water users in the basin are Colorado Springs and the Board of Water Works of Pueblo, both of which use surface water as their primary water source. Their future demand projections, as utilized in the Daily Model, are shown in Table 5.

Table 5. Summary of Municipal Demands for non AVC and Master Contract Participants

Entity	Direct Effects		Cumulative Effects	
	(MGD)	(ac-ft)	(MGD)	(ac-ft)
Colorado Springs Utilities	71.07	79,601	176.20	197,512
Board of Water Works of Pueblo	24.2	27,105	69.64	44,405
City of Aurora	35.27	39,501	47.5	53,209

Existing and future Colorado Springs demand originates from data received from Colorado Springs Utilities for existing water use, and the Southern Delivery System EIS for future water use. Although the Southern Delivery System EIS indicates that the demand shown is for 2046, it represents the maximum amount of deliveries and associated return flows that are included in the Record-of-Decision for that project. Any additional deliveries through the system would require additional NEPA, which is not reasonably foreseeable.

Future demands for the Board of Water Works of Pueblo are adjusted demand projections from the Southeastern Arkansas Basin Future Water and Storage Needs Assessment (GEI 1998); 2070 demand projections from the study are adjusted by subtracting out the difference between the study's 2010 demand projects and actual 2010 demand. The City of Aurora demand for 2010 and 2070 is represented by demand through the Homestake Pipeline, and generally represents the maximum amount of flow expected through the Homestake Pipeline given reasonably foreseeable water supplies. A summary of demands used in the model for these larger entities is presented in Table 5.

Most of the remaining municipal water users in the basin are explicitly simulated as part of the AVC or Master Contract, and demands (including participant water systems and supplies) are documented in Chapter 1 and Appendix A of the EIS. The following sub-sections describe system components and basic operations for the AVC and Master Contract participants.

A few smaller municipal water supply systems scattered throughout the model area (primarily municipal systems in the Upper Arkansas Basin that are not Master Contract participants) are not explicitly simulated by the Daily Model. Diversions and subsequent return flows for these smaller water providers are implicitly included in the gain-loss calculations.

The primary industrial water use in the model area is for cooling at power plants and the Evraz Rocky Mountain Steel (formerly Colorado Fuel & Iron) steel mill, which has a relatively low consumptive use. The Southern Delivery System Model Documentation Report further describes industrial water users in the model area.

Water Supplies

Water supplies for water users in the Arkansas River Basin are primarily made up of native supplies from Arkansas River surface flows, groundwater, and transmountain diversions. As previously mentioned, exchanges are an important means to recapture reusable return flows for the water users. The following sub-sections describe the supply and use of native Arkansas River water, transmountain diversion projects, exchanges and changed water uses, the Arkansas River water bank, and the existing flow management programs and instream flow water rights.

Native Water Rights

Native water in the Arkansas River Basin is administered according to the Prior Appropriation Doctrine. Direct flow water users own rights to use water from the stream according to availability. When streamflow cannot meet all water rights, a call is placed on the river, and diversions are satisfied in priority based on the date of the water right appropriation. Arkansas River water is highly appropriated. Only in extremely wet periods is there a "free river" when there is no call on the river and all rights are satisfied. Native water rights simulated in the Daily Model are in Appendix A.2 and A.3.

Arkansas River Compact

Native streamflows in the Arkansas River are administered according to the requirements of the Arkansas River Compact (Colorado Statutes, Title 37, Article 69, Section 37-69-101). The Arkansas River Compact was ratified by the states of Colorado and Kansas in 1948. In general, the Compact divides and apportions waters of the Arkansas River between the states of Colorado and Kansas and sets forth operating criteria for John Martin Reservoir, which was constructed by the U.S. Army Corps of Engineers in 1943. The Southern Delivery System Model Documentation Report further describes the provisions of the Compact. Methods used to ensure historical deliveries water for the Compact to John Martin Reservoir are described in later sections of this document.

Fry-Ark Project

A thorough description of the Fry-Ark Project, West Slope and East Slope water supplies, and accounting is contained in Appendix D.1. The Daily Model uses the same inflow and allocation datasets and methods as described in Appendix D.2 for the AVC yield analysis. This section focuses on aspects of the Fry-Ark Project not contained in other parts of the EIS, including overall Fry-Ark Project demands, Pueblo Reservoir accounting and spill priorities.

Fry-Ark Project Demand

For explicitly simulated Fry-Ark municipal entities, Fry-Ark water supplies are supplemental supplies to existing supplies and simulated as such in the model. For implicitly simulated Fry-Ark municipal entities, a method is required to estimate future water deliveries. In the Southern Delivery System EIS, demands for Fry-Ark Project participants within the Southeastern were estimated by previous studies (GEI 1998). All municipal Fry-Ark entities were lumped into the Southeastern groupings and demands; Entities West of Pueblo, Pueblo (Board of Water Works of Pueblo), Entities East of Pueblo, and Fountain Valley Authority entities (Colorado Springs, Fountain, Security, Widefield and Stratmoor Hills). For the AVC EIS, most of the Fry-Ark entities in the basin are either AVC or Master Contract project participants. Therefore, their demand is explicitly simulated. Demand for AVC and Master Contract participants was obtained from the individual participants and is detailed in Appendix A of the EIS. Demands for those Fry-Ark entities that are not AVC or Master Contract participants (primarily a few West of Pueblo entities) are lumped into the West of Pueblo demands as they were for the Southern Delivery System EIS.

Unallocated water is that portion of the Fry-Ark Project yield that is available to agricultural water users. Typically, this is the 49 percent (minus NPANIW supplies) of Fry-Ark Project yield not allocated to municipal entities plus any unused allocations from previous years (see Appendix D.2 for additional discussion of Fry-Ark allocations). A single unallocated project water account, equal to total Fry-Ark Project space minus municipal carryover space, was simulated. Agricultural water users draw from this account to meet their demands. Southeastern allocates Fry-Ark Project water on an acre-foot of water per eligible acre basis. The daily model assumes that Fry-Ark Project water is made available to agricultural demands on a "first come-first served" basis, which was found to allow a closer approximation to historical operations in the calibration model. Because it was assumed that future agricultural demands would typically be the same as their historical demands, any historical demands not met by their native or storage rights are met by Fry-Ark Project water in the Daily Model. Because the model does not simulate all historical leases and temporary sales to agricultural entities, this assumption results in occasional deliveries of Fry-Ark water to agricultural entities that may not be consistent with historical operations.

Project Reservoir Accounts

As previously mentioned, the Fry-Ark Project includes one Western Slope reservoir, three Eastern Slope reservoirs, and one Eastern Slope forebay reservoir. The storage volumes for each of these reservoirs are shown in Table 6. The three major Eastern Slope reservoirs, Turquoise Lake, Twin Lakes, and Pueblo Reservoir, are explicitly included in the model. Because Western Slope operations are not explicitly simulated in the Daily Model, storage in Ruedi Reservoir was not simulated. In addition, because storage in the Mount Elbert Forebay is primarily associated with power generation at the Mount Elbert Powerplant, storage in this facility is not explicitly simulated in the model.

Table 6. Fry-Ark Project Reservoir Storage Volumes

Reservoir	Reservoir Storage (ac-ft)					
	Dead	Inactive [1]	Active Conservation	Joint Use	Flood Control	Total Capacity
Ruedi	63	1,095	101,278	0	0	102,373
Turquoise	2,810	8,920	120,478	0	0	129,398
Pueblo	2,329	28,121	228,828	66,000	26,991	349,940
Twin Lakes	63,324	72,938	67,917	0	0	140,855
Mount Elbert Forebay	561	3,825	7,318	0	0	11,143

Source: Fry-Ark AOP (Reclamation 2004)
Notes:
(1) Inactive includes dead storage

Reclamation has historically contracted with entities to allow storage of non-Project water in Fry-Ark Project storage space. These contracts were historically referred to as If-and-When contracts and were approved annually. The largest users of these contracts have historically been Colorado Springs and the City of Aurora and amounts have been about 10,000 acre-feet. These contracts are now referred to as "Short-term Excess Capacity Contracts" (Short-Term Contracts). Historical contract amounts are shown in Table 7, Table 8, and Table 9.

"Long-term Excess Capacity Contracts" simulated in Project facilities are held by the City of Aurora, Southern Delivery System participants and the Board of Water Works of Pueblo. Because these contracts are binding, these contracts were included in existing conditions and direct effects runs according to existing volumes, and the in the cumulative effects runs at future maximum volumes. A variety of water supplies are used to fill this space, including exchange of reusable return flows. Full model settings for these accounts, water supplies and use are contained in Appendix D.3.

Table 7. Historical Pueblo Reservoir Excess Capacity Contracts (1986-1993)

Entity	1986	1987	1988	1989	1990	1991	1992	1993
Aurora	1,000	1,000	1,000	10,000	10,000	10,000	1,000	
Arkansas Groundwater Users Association								
Beaver Park								
Bessemer Ditch								1,250
Brewer, Robert							283	
Bureau of Land Management								
Carter, Alvin							281	220
Catlin Canal Co			250	250	250	300	300	300
Cesar Dairy								
Colorado Springs	500		1,000		2,500	6,000	6,000	10,000
Colorado Department of Corrections								
Colorado Water Protective and Development Association								
Dept. of Parks and Outdoor Rec.								
City of Fountain								
Holbrook Mutual Company								
Jordan, Gerald								
Lower Arkansas Water Management Association								
Lower Arkansas Valley Water Conservancy District								
Orville Tomky							58	
Public Service Company								
Board of Water Works of Pueblo		250	2,000	2,000	2,000	3,000	3,000	3,000
Pueblo West Metropolitan District								
Round Mountain								
Salida								
Security Water District								
Southeastern Colorado Water Activity Enterprise								
Southwest Ready Mix								
Stratmoor Hills								
St. Charles Mesa Water District								
United Feeders								
Upper Arkansas Water Conservancy District								
Victor								
Widefield Water and Sanitation District								
TOTALS	**1,500**	**1,250**	**4,250**	**12,250**	**14,750**	**19,300**	**10,922**	**14,770**

Table 8. Historical Pueblo Reservoir Excess Capacity Contracts (1994-2001)

Entity	1994	1995	1996	1997	1998	1999	2000	2001
Aurora	1,700	3,500	3,000	3,000	1,000	3,000	3,000	3,000
Arkansas Groundwater Users Association								
Beaver Park	1,000	1,000						
Bessemer Ditch		10,000						
Brewer, Robert	400	400						
Bureau of Land Management								
Carter, Alvin	335							
Catlin Canal Co	1,000	1,000	1,000	1,000				
Cesar Dairy	150	250						
Colorado Springs	10,000	10,000	10,000	10,000	10,000	10,000	2,500	5,000
Colorado Department of Corrections	75	220						
Colorado Water Protective and Development Association	1,000	2,100						
Dept. of Parks and Outdoor Rec.	7,200	3,500						
City of Fountain								
Holbrook Mutual Company		3,403						
Jordan, Gerald	500	500						
Lower Arkansas Water Management Association		165						
Lower Arkansas Valley Water Conservancy District								
Orville Tomky	250							
Public Service Company			1,000					
Board of Water Works of Pueblo	3,000	3,000	3,000	3,000	3,000	3,000	5,000	5,000
Pueblo West Metropolitan District						1,000	1,000	1,000
Round Mountain								
Salida								
Security Water District								
Southeastern Colorado Water Activity Enterprise								
Southwest Ready Mix	50							
Stratmoor Hills								
St. Charles Mesa Water District								
United Feeders								
Upper Arkansas Water Conservancy District	120	150			50	50		
Victor								
Widefield Water and Sanitation District								
TOTALS	**26,780**	**39,188**	**18,000**	**17,000**	**14,050**	**17,050**	**11,500**	**14,000**

Table 9. Historical Pueblo Reservoir Excess Capacity Contracts (2002-2009)

Entity	2002	2003	2004	2005	2006	2007	2008	2009
Aurora	5,000	5,000	10,000	10,000	10,000	10,000	10,000	10,000
Arkansas Groundwater Users Association								500
Beaver Park								
Bessemer Ditch						1,000	1,000	1,000
Brewer, Robert								
Bureau of Land Management				500	400	400	400	400
Carter, Alvin								
Catlin Canal Co		200	100	100				
Cesar Dairy								
Colorado Springs	5,000	10,000	10,000	15,000	15,000	17,000	17,000	17,000
Colorado Department of Corrections					100	120	200	300
Colorado Water Protective and Development Association		1,000	750	3,750	5,000	6,500	6,500	6,500
Dept. of Parks and Outdoor Rec.			2,000	600	590	600	650	1,000
City of Fountain		1,300	1,300	1,300	600	600	600	600
Holbrook Mutual Company								
Jordan, Gerald								
Lower Arkansas Water Management Association								
Lower Arkansas Valley Water Conservancy District			500	500	500	1,000	2,000	2,500
Orville Tomky								
Public Service Company								
Board of Water Works of Pueblo	5,000	5,000	5,000	3,000	6,000	6,000	6,000	6,000
Pueblo West Metropolitan District	2,000	2,000	3,000	6,000	9,000	9,000	9,000	9,000
Round Mountain						50	50	50
Salida		350	350	350	350	625	625	625
Security Water District		400	400	400	200	400	400	200
Southeastern Colorado Water Activity Enterprise		100						
Southwest Ready Mix								
Stratmoor Hills			100	100	100	100	100	100
St. Charles Mesa Water District		150	260	375			500	500
United Feeders							216	216
Upper Arkansas Water Conservancy District					50	1,000	1,000	1,000
Victor							100	100
Widefield Water and Sanitation District		400	400	400	400	400	400	400
TOTALS	**17,000**	**25,900**	**34,160**	**42,375**	**48,290**	**54,795**	**56,741**	**57,991**

The spill priority of non-Project water stored in excess capacity storage space is important in simulating storage in Fry-Ark Project reservoirs. The spill priorities can be found in Article 13 of Contract No. 5-07-70-W0086, as amended, between Southeastern and the United States, governing the evacuation of water from Pueblo Reservoir. The spill order became part of the Contract by the Fourth Amendment in 1984. The spill priorities in Article 13 provide (reprinted from Reclamation 1990, Reclamation 2006):

(a) Whenever water is evacuated from Pueblo, Twin Lakes, and Turquoise Lakes to meet the necessities of Project flood control, power generation purposes, storage of transmountain Project water, storage of native Project water, and Project operational requirements; except as provided in Sub article 13. (b) below, the water evacuated shall be charged in the following order:

1. Against water stored under contracts for if-and-when available storage space for entities which will use the water outside the District boundaries.

2. Against water stored under contracts for if-and-when available storage space for entities which will use the water within the District boundaries. This evacuation shall be charged pro rata against water stored under all such like contracts at the time of the evacuation.

3. Against any winter storage water in excess of 70,000 acre-feet (ac-ft).

4. Against water stored under contracts with municipal entities within the boundaries of the District, which water is neither Project water nor return flow from Project water and which water is limited to 163,100 ac-ft less any Project water purchased and stored by municipal users. This evacuation will be charged pro rata against the water stored under all such like contracts at the time of evacuation.

5. Against winter storage water not in excess of 70,000 ac-ft

6. Against Project water accumulated from the Arkansas River and its tributaries.

(b) Notwithstanding the order of evacuation of water listed in Sub article 13. (a) above, evacuation of water from storage pursuant to existing firm storage contracts, the Highline storage contract and future storage contracts that may be entered into with the Board of Water Works of Pueblo, and Twin Lakes Reservoir and Canal Company to satisfy prior commitments will be made pursuant to the terms of such storage contracts.

Simplifying assumptions are made in the Daily Model regarding spill priorities due to uncertainties in the interpretation of the spill priorities, complications in administering these priorities in the Daily Model and the relative infrequency of when spills actually occur. The following describes the current Daily Model simplifying assumptions (in order of spill).

- Spill Priority 1 – Out-of-District Excess Capacity: Out-of-District entities are the first to spill. For the Southern Delivery System EIS model runs, the only out-of-District entity was Aurora. Victor and Round Mountain are being added as part of the AVC EIS model. These accounts are spilled pro-rata based on the amount of storage in the accounts at the time of the spill.

- Spill Priorities 2/4 – In-District Municipal Excess Capacity: This includes all permanent and temporary contracts for in-District entities, including the Board of Water Works of Pueblo, all Southern Delivery System participants, Pueblo West, Master Contract entities, and other temporary excess capacity contract (if-and-when) holders.[1] At the time of the Southern Delivery System EIS, simulated temporary excess capacity accounts were limited to major participants. As part of the AVC EIS, all temporary excess capacity accounts are simulated. Spills are pro rata based on the amount of water in storage at the time of the spill. It should also be noted that Project return flows are stored in Excess Capacity storage space, and not tracked separately once stored in that space. Therefore, they are spilled by the model when Excess Capacity is spilled.

- Spill Priorities 3/5 – Winter Water: Winter Water spills after both in-District and out-of-District Excess Capacity accounts. Figure 2 shows historical Winter Water storage in Pueblo Reservoir. As shown, Winter Water is rarely above 70,000 acre-feet (only once in the model study period), so this simplification is rarely a factor.

- Project Water – The model is set up to never spill Project water, regardless of whether it is Eastern Slope or Western Slope water. Once Project storage space is full, the model stops diverting Western Slope water through the Boustead Tunnel.

In order to quantify the approximate effect of these simplifying assumptions on Daily Model results, a spreadsheet analyses was performed (Reclamation 2011). Daily model results from the AVC Existing Conditions model (study period 1982-2009), were used as input for the double scenario analysis. The first scenario simulates the spill priorities based on the spill priority language previously described in Article 13, by considering spill priorities 2, 3, 4, and 5 separately. The second scenario simulates the spill priorities based on the simplifying assumptions. The results of the analysis showed that the simplifying assumptions under estimate spills from Pueblo West excess capacity accounts, and slightly over-estimating spills from in-District excess capacity accounts during a few years in the model. The total amount spilled and the amount of storage in Project reservoirs would be the same under both scenarios, thus it would not affect the other resource studies being performed for the EIS.

The simplifying assumptions were deemed appropriate for use in the Daily Model for the following reasons:

[1] Spill priority 4 applies only to municipal contracts; any agricultural excess capacity storage would spill under priority 2. However, due to the assumptions made in the model, municipal and agricultural excess capacity storage is spilled pro-rata under priority 2/4.

- Historical data and simulation of Winter Water storage in Pueblo Reservoir shows that it rarely, if ever, exceeds 70,000 acre-feet. During years when it exceeds 70,000 acre-feet (i.e. wet years), it is likely that all excess capacity accounts will spill anyway (including a portion or all of Winter Water storage). Figure 2 shows historical Winter Water storage in Pueblo Reservoir from 1976-2009 (Reclamation 2011). These values represent the maximum storage recorded for the water year shown.

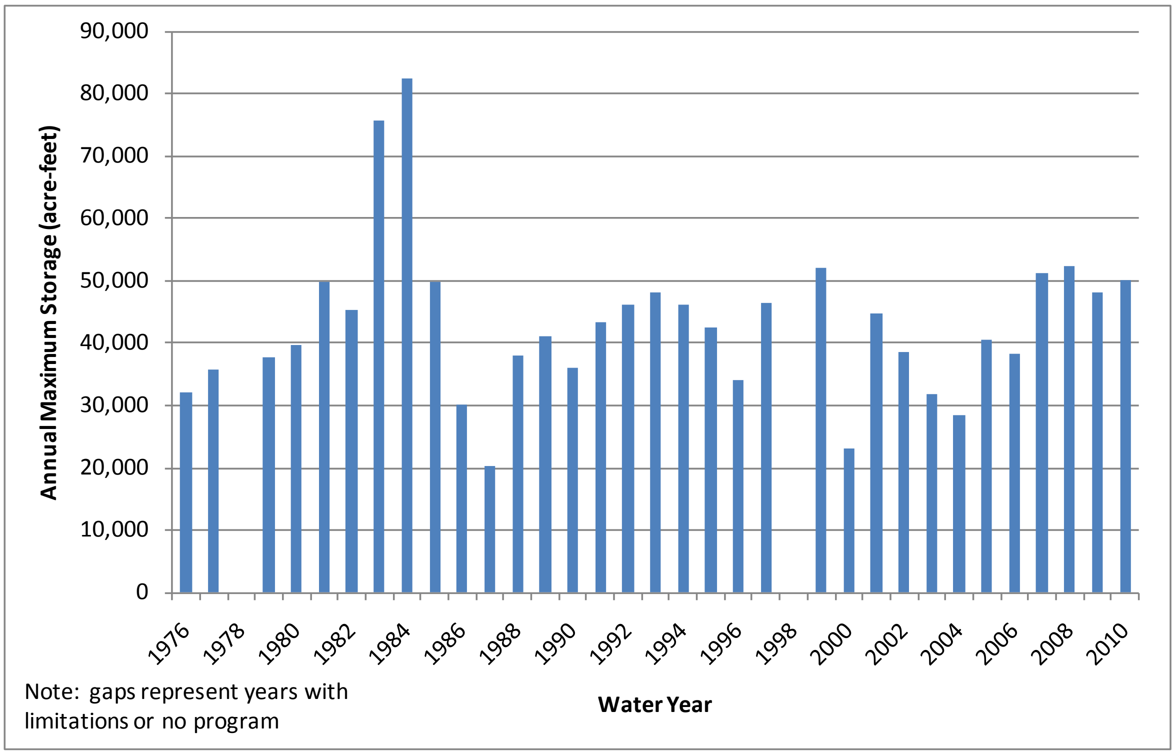

Figure 2. Historical Pueblo Reservoir Winter Water Storage

- In the future, during times when spills become imminent, it is likely municipal carryover storage space (i.e. 163,100 acre-feet) would be nearly full or completely full with Fry-Ark Project water. This occurs because municipal Fry-Ark entities are likely to purchase and store most, if not all, Fry-Ark allocations in Fry-Ark carryover storage space. When the Fry-Ark carryover storage space is full with Fry-Ark Project water, this "automatically" moves excess capacity storage by these entities from the number 4 spill priority to the number 2 spill priority.

- Historically, the Fry-Ark Project storage space in Pueblo Reservoir is only completely filled when Eastern Slope water rights are in priority (i.e. Boustead Imports alone typically do not fill Pueblo Reservoir). When Eastern Slope water rights are in priority, it has historically been "excessive" and caused all excess capacity accounts to spill, regardless of the priority. Although 2011 may prove to be the first year in which Boustead Imports fill Project storage, 2011 is not in the AVC EIS study period (1982-2009). Therefore, in the model study period, there are no years in which a change in spill priorities for municipal excess capacity accounts would cause a substantive change in spills by any individual excess capacity account participant.

Other Transmountain Diversions

Other transmountain diversions include the Homestake Project, the Twin Lakes Reservoir and Canal Company project and the Busk-Ivanhoe project. Smaller projects such as the Columbine, Ewing, and Wurtz Ditches, and Blue River Project, are either small in scale, or have main system components outside of the model area. These diversions, or portions of their components, are implicitly modeled.

Homestake Project

The Homestake Project is a municipal transmountain diversion project owned jointly by Colorado Springs and the City of Aurora. The Western Slope diversion system diverts water from the Homestake Creek watershed, a tributary of the Eagle River, into Homestake Reservoir. From Homestake Reservoir, this water is diverted to Turquoise Lake through the Homestake Tunnel. From Turquoise Lake, water is conveyed to Twin Lakes via contract exchange with Reclamation. From Twin Lakes, water is diverted through the Twin Lakes pipeline to the Otero Pump Station, where it is pumped into the Homestake pipeline. Both Colorado Springs and the City of Aurora have 15,000 acre-foot long-term storage contracts in Turquoise Lake for storage of Homestake water. By contract, this storage space can only be used for storage of Homestake. Historical yield of the Homestake System is about 25,400 acre-feet (Colorado Decision Support System 2010).

Twin Lakes Reservoir and Canal Company

The Twin Lakes Reservoir and Canal Company is a transmountain diversion and storage system constructed in the 1930s to serve lands under the Colorado Canal system (U.S. Geological Survey 1984). The Independence Pass Transmountain Diversion System diverts water from several streams located in Pitkin County on the Western Slope into Grizzly Reservoir. From Grizzly Reservoir, this water is diverted into the Twin Lakes (or Independence Pass) tunnel into Lake Creek above Twin Lakes. In addition, the Twin Lakes Reservoir and Canal Company also possesses Eastern Slope water rights with 1896 and 1897 priority dates. Table 10 summarizes ownership of the Twin Lakes Reservoir and Canal Company. Twin Lakes Reservoir and Canal Company average annual historical yield for transmountain water supply and native water rights were 36,500 acre-feet and 11,700 acre-feet, respectively, for the study period (total of 48,200 acre-feet) (Colorado Decision Support System 2010).

Table 10. Twin Lakes Reservoir and Canal Company Ownership Distribution

Entity	Shares	Percent
Colorado Springs	27,125.693	54.70
Aurora	2,488.475	5.02
Board of Water Works of Pueblo	11,476.157	23.14
Pueblo West	5,898.160	11.89
Augmentation	451.224	0.91
Other M&I	1,868.396	3.77
Other Ag and Inactive	280.86	.57
Total	49,588.965	100.00

Source: Twin Lakes Reservoir and Canal Company (2010)

Busk-Ivanhoe System

The Busk-Ivanhoe System is a transmountain diversion project that diverts water from the upper reaches of Ivanhoe Creek in the Colorado River Basin to Turquoise Lake. Diversions are made through the Ivanhoe Tunnel, also known as the Carlton Tunnel, which is a converted railroad tunnel. However, due to the condition of the tunnel, it cannot carry the full transmountain supply. In recent years, the Board of Water Works of Pueblo has contracted with Reclamation to carry a portion of the supply through the Boustead Tunnel. However, it has not done so since 2003. The Busk-Ivanhoe System average annual yield is about 5,200 acre-feet for the study period (Colorado Decision Support System 2010).

The Board of Water Works of Pueblo and the City of Aurora have equal ownership of the system, including 10,000 acre-feet of storage in Turquoise Lake. The 10,000 acre-feet of Busk-Ivanhoe storage space in Turquoise Lake is firm storage space but can only be used to store agricultural water and is seldom used by the City of Aurora or Board of Water Works of Pueblo. However, both the City of Aurora and Board of Water Works of Pueblo own 5,000 acre-feet each of if-and-when storage space in Turquoise Lake through their purchase of shares originally owned by Colorado Fuel & Iron (called CF&I space). Because the Busk-Ivanhoe storage space is not normally used, the CF&I space is normally available and the entities store Busk-Ivanhoe water, along with other water, in this space. The City of Aurora takes delivery of its water through the Homestake pipeline via the Mt. Elbert Pipeline, Twin Lakes and the Otero Pump Station. The Board of Water Works of Pueblo typically leases most of their Busk-Ivanhoe yield to Aurora (2,500 acre-feet per year). Any remaining yield is either stored in CF&I storage space or leased to other entities in the Arkansas River Basin.

Columbine, Ewing, and Wurtz Ditches

Columbine, Ewing and Wurtz Ditches are smaller transmountain diversion ditches that divert water from the Colorado River Basin to the Arkansas River Basin near Tennessee and Fremont Passes north of Leadville. The Board of Water Works of Pueblo owns the diversion structures and their associated water rights. Because of their relatively small diversion amount and small influence on overall flows in the Arkansas River Basin, future diversions through these ditches are assumed to equal historical diversions. Columbine, Ewing, and Wurtz Ditches average annual historical yield was about 5,800 acre-feet for the study period (Colorado Decision Support System 2010).

Blue River Project

The Blue River Project is a transmountain project that diverts water from the upper reaches of the Blue River into Colorado Springs' local system. Water is diverted out of several tributary streams to the Blue River and the Blue River headwaters through a series of pipelines and tunnels to the Hoosier Tunnel. The Hoosier Tunnel conveys water beneath the Continental Divide to Montgomery Reservoir in the South Platte River Basin. From Montgomery Reservoir, water flows by gravity through the Blue River Pipeline to North Catamount Reservoir on the north slope of Pike's Peak where it is then conveyed to Colorado Springs water treatment plants.

By decree, water diverted through the Blue River system must be reused to extinction by Colorado Springs. Therefore, although its direct imports do not affect the model area, the reusable return flows resulting from its use do affect the model area. The recent Blue River Substitution Agreement (Blue River May Intergovernmental Agreement 2003; Blue River

October Intergovernmental Agreement 2003) provides for the continuation of historical operations of the Blue River system.

Multiple Use Diversion Projects

The multiple use diversion projects in the Arkansas River Basin primarily consist of projects that were formerly used entirely for agriculture, but are now used as agricultural, municipal, and industrial water supplies. Although most of the canal companies have at least a small amount of their shares owned by municipal or industrial entities, there are two systems in the Arkansas River Basin that have a majority of their shares owned by entities outside of agriculture: the Colorado Canal system and the Rocky Ford Ditch. Each of these systems is discussed in more detail in the Southern Delivery System Model Documentation Report. A substantial portion of the shares in the Bessemer Ditch have recently been purchased by municipal entities. However, since the ultimate transfer of these shares to municipal use is not considered reasonably foreseeable in the AVC EIS (see Appendix B.4), this system remains an agricultural system in the model.

Winter Water Storage Program

The Winter Water storage program was developed to allow agricultural water users to store in-priority water rights during the winter in Pueblo Reservoir. Prior to completion of Pueblo Dam, agricultural entities would divert their water rights in-priority through their normal conveyance systems to maintain soil moisture levels. However, problems associated with wintertime operations were frequently experienced. Therefore, beginning in 1975, a program was developed to allow these entities to divert water into storage for use during the following irrigation season (Reclamation 1990). The program was decreed in 1987 (84CW179, Division 2). The Winter Water Storage Program operation is part of the Colorado Springs exchange decree through the Winter Water Storage Program Stipulation (December 28, 1984). In general, the Winter Water storage program allows much of the agricultural native flow water rights in the Arkansas River during the Winter Water storage season (November 15 – March 15) to be stored in Pueblo Reservoir or other off-channel storage facilities below Pueblo Reservoir. The Southern Delivery System Model Documentation Report further describes the Winter Water Storage Program.

Exchanges and Alternate Points-of-Diversion

Exchanges and alternate points-of-diversion are the primary means for moving consumptive use water to upstream storage and conveyance facilities. The Daily Model is constructed to execute exchanges from decreed locations into Pueblo Reservoir and from Pueblo Reservoir to other upstream locations. There are several decreed exchanges on the Arkansas River as well as numerous others that currently have applications in water court or are being contemplated by municipal entities within the basin. Many of the exchanges into Pueblo Reservoir are governed by the water right stipulation of June 5, 1985 that allows entities exchanging into Pueblo Reservoir storage to share exchange opportunities. A summary of the decreed, pending, and potential future exchanges into Pueblo Reservoir is presented in Appendix D.1.

The decreed exchanges are administered in a rather complex priority system and often have monthly and annual limitations. Several exchanges are dependent upon using Fry-Ark Project storage space to facilitate the exchanges. The use of Fry-Ark Project facilities to facilitate these exchanges was discussed above.

Flow Management Programs and Minimum Flows

There are several legally binding, decreed and voluntary minimum flow requirements and flow programs within the model area, especially along the Arkansas River. Many of the minimum flows are tied to decreed change cases and exchanges. Chapter 3 of the AVC EIS and the Southern Delivery System Model Documentation Report describes these programs in detail.

Restoration-of-Yield Storage

Restoration of Yield Restoration-of-Yield Storage was developed in principle as part of the Pueblo Flow Management Program (FMP) Intergovernmental Agreements (March Intergovernmental Agreement 2004; May Intergovernmental Agreement 2004). The intent of Restoration-of-Yield Storage is to develop operations and facilities that would allow the signatory parties to recover a portion of the yield lost as part of their participation in the FMP. Restoration-of-Yield Storage is further described in the Southern Delivery System Model Documentation Report.

Lower Arkansas Valley Water Conservancy District

The Lower Arkansas Valley Water Conservancy District (Lower Ark District) has requested that 5,000 acre-feet of Master Contract space be analyzed in the EIS. The Lower Ark District has proposed to store existing water rights that it owns and future ditch leases, and deliver these supplies for municipal, industrial and agricultural purposes. Several other AVC and Master Contract participants have listed Lower Ark District water as a potential supply for meeting future demand. The Lower Ark District has identified several district-owned water supplies (owned supplies), and potential irrigation companies that would temporarily lease water to the district (leased supplies) for use in the Master Contract (Table 11). It is assumed that the owned supplies constitute permanent agricultural dry-up (and have a set annual yield), whereas the leased supplies are provided on a rotational fallowing basis (in which yield is dependent on several factors).

Lower Ark District supplies originating from the Fort Lyon Canal will be restricted to Fort Lyon Canal deliveries in which return flows accrue upstream from John Martin Reservoir. These deliveries represent approximately 15 percent of Fort Lyon Canal deliveries in the Hydrological-Institutional model (H-I model). The same percentage will be used as a source of supply for the Lower Ark District in the Daily Model. It is assumed that return flows accruing in or downstream of John Martin Reservoir cannot be exchanged to Pueblo Reservoir Master Contract accounts, and will therefore not be considered in the EIS.

The use of reusable return flows originating from Lower Ark District deliveries will be negotiated in each individual contract made with the lessees. As there is not yet a Lower Ark District contract to set precedence, this study assumes return flows can be reused by the lessee.

Use of Winter Water belonging to shareholders that lease water to the Lower Ark District is the subject of ongoing discussion between the Lower Ark District, Southeastern Colorado Water Conservancy District, and Reclamation. Use of Winter Water in the Master Contract is plausible, but exact mechanisms of its use have yet to be determined. The EIS will assume that Winter Water must be delivered to a head gate to maintain historical flow patterns, but can be exchanged back to Pueblo Reservoir as exchange potential conditions allow.

Table 11. Proposed Lower Ark District Supplies For Use in Master Contract

Supply	Ditch Shares Owned or Leased	Consumptive Use Ratio (1)	Average Annual Yield (acre-feet)
Supplies Owned by Lower Ark District			
Catlin Canal	0.1	0.4634	0.0
LAWMA	150.0		
Ft. Lyon Canal	50.0	0.5094	25.5
Twin Lakes	91.0	1.1000	100.1
Colorado Canal	2.0	0.6356	1.3
Lake Meredith	2.0	0.2500	0.5
Bessemer Ditch	73.6	0.5916	43.5
Holbrook Canal	132.3	0.5771	76.4
Rocky Ford Ditch	1.0		
Las Animas Consolidated Canal	1.0	0.5353	0.5
High Line Canal	6.0	0.5553	3.3
Larkspur Ditch	12,141.4		500.0
Subtotal	12,650.4		751.1
Supplies Leased to Lower Ark District			
Bessemer Ditch	2,767 (2)	0.5916	(3)
High Line Canal	259 (2)	0.5553	(3)
Oxford Farmers Canal	519 (2)	0.4728	(3)
Otero Canal	8,980 (2)	0.5675	(3)
Catlin Canal	2,193 (2)	0.4634	(3)
Holbrook Canal	3,452 (2)	0.5771	(3)
Fort Lyon Canal/Storage Canal	4,947 (2)	0.5094	(3)
Subtotal	23,117 (2)		(3)
Total	35,767.4		

Notes:

(1) Consumptive use ratio is the assumed ratio of yield to shares owned or leased. This value varies by ditch due to differences in share structure by the ditch company, water rights, yields and other factors.

(2) Shares needed to fill the 5,000 acre-feet of excess capacity space once per year. Represents the maximum shares needed if a particular ditch was the only supply.

(3) Leased supplies yield is dependent on remaining demand calculated within the Daily Model.

Agricultural Dry-Up

Proposed operations evaluated in the EIS will result in agricultural dry-up and changes in groundwater pumping by several municipal entities. Several participants have identified water rights currently decreed for agricultural irrigation as potential water supplies for both the AVC and Master Contract. Mechanisms used to simulate this agricultural dry-up are discussed in later sections.

Return Flow Parameters

Return flows play an important part in the overall hydrology of the Arkansas River Basin. Average annual diversions from the river within the model area exceed 1.1 million acre-feet, while average annual inflows to Pueblo Reservoir (including transmountain inflows) and from Fountain Creek (including transmountain return flows) are approximately 0.7 million acre-feet. Neglecting the minor inflows downstream from Pueblo Reservoir, within the model area, return flows account for approximately 0.4 million acre-feet, or approximately one-third of the overall water supply in the model area.

The following paragraphs discuss the setup of agricultural and municipal return flow accounting in the Daily Model. It should be noted that the return flow values shown in the tables throughout this section apply to estimated physical conditions. They may not necessarily match decreed return flow values, as the decreed values frequently have conditions that may not be physically based.

Agricultural Return Flows

Agricultural return flows are simulated for the major irrigation diversions on the Arkansas River. Minor agricultural return flows are implicitly simulated in the reach gains and losses. The first step in calculating agricultural return flows is determining the overall efficiency and inversely, the return flow percentage, for each diversion. In its administration of return flows on the river, the Division Engineer's Office assumes a 40 percent return flow rate for all irrigation diversions. However, in work performed in Kansas v. Colorado (U.S. Supreme Court, No. 105, Orig.), return flows were found to vary depending upon ditch system. Table 12 presents a summary of the return flow percentages found in the 1996 Kansas Hydrologic Institute (H-I) model, the latest model accepted by the Special Master. Because these values constitute the "best available information" required in the EIS, these values were assumed in the Daily Model for each of the diversions explicitly simulated. Deliveries made to each of the agricultural diversions are multiplied by the return flow percentage shown in the table to quantify the volumetric amount of the return flow. Recent U.S. Supreme Court documents (i.e. H-I Model documentation; Littleworth 2008) published reach allocation tables of surface water and groundwater return flows that provided better resolution than previously used. These tables were incorporated into the model to better characterize historical agricultural return flow patterns.

Table 12. H-I Model Average Historical Efficiencies and Return Flows by Canal

Diversion Number	Ditch	Historical Efficiency (%)	Return Flows [1] (%)
1	Bessemer Ditch	55	45
3	Excelsior Ditch	61	39
5	Colorado Canal	68	32
6	High Line Canal	53	47
7	Oxford Farmers Canal	40	60
8	Otero Canal	72	28
9	Catlin Canal	42	58
10	Fort Lyon Canal	57	43
11	Rocky Ford Ditch	38	62
12	Holbrook Canal	62	38
13	Las Animas Consolidated Canal	56	44

Source: 1996 Kansas H-I Model. Reported as "Total Irrigation Efficiency" in the following document: Kansas 1996 Model BUDAYCY.wk4.
Notes:
(1) Return Flows = 1 – Historical Efficiency

The next step in calculating agricultural return flows is to lag the volumetric return flows both spatially and temporally. These distributions were taken from the reach allocation tables of the H-I model documentation (Littleworth 2008). Table 13 and Table 14 present the spatial distribution of return flows from each of the ditches to reach locations along the river. For purposes of the Daily Model, it was assumed that the return flows accrue to the river at the most downstream node within the reach.

Table 13. Surface Water Distribution of Return Flows by Canal and Reach

Arkansas River Reach	Percent of Return Flows Returning by Division Number										
	1	3	5	6	7	8	9	10	11	12	13
1	65	30									
2	25	70									
3	10		2								
4			1	12	25						
5			5	14	75	8					
6			28	17		17	15		1		
7				57		75	85	2	99	20	
8								5			
9								7		44	60
10-18								86			40
19			64								
20										36	
Total	100	100	100	100	100	100	100	100	100	100	100

Table 14. Groundwater Distribution of Return Flows by Canal and Reach

Arkansas River Reach	Percent of Return Flows Returning by Division Number										
	1	3	5	6	7	8	9	10	11	12	13
1	65.07	45.97									
2	24.68	53.87									
3	10.25	0.16	3.70		0.01						
4			2.92	23.35	46.21	0.45					
5			5.13	15.68	49.45	5.62	0.02				
6			18.65	18.52	4.33	10.16	11.97		0.97	0.00	
7			0.02	42.44		83.77	87.99	0.68	99.03	15.00	
8							0.01	6.36	0.00		0.03
9			4.20					7.96		46.90	52.25
10-18								85.01			47.72
19			65.36								
20										38.1	
Total	100	100	100	100	100	100	100	100	100	100	100

Municipal

Municipal return flows are calculated in much the same manner as the agricultural return flows. However, because the timing, quantity, and location of municipal return flows vary depending on whether deliveries are made for indoor or outdoor water use, municipal demands and subsequently all municipal demand for which return flows are calculated are divided amongst indoor deliveries (producing sewered return flows) and outdoor deliveries (producing non-sewered return flows).

Because of the time it takes return flow to reach accrual points on the river, surface and groundwater accretion functions, or lag patterns, are required for the return flows. For the purposes of the Daily Model, AVC participants in the Fountain Creek basin use the lag pattern developed for Colorado Springs. All other participants along the Arkansas River use the lag pattern developed for Board of Water Works of Pueblo. The development of these lag patterns, along with additional details regarding municipal return flows, are discussed in the Southern Delivery System Model Documentation Report.

Storage Facilities

Storage facilities simulated in the Daily Model are consistent with those simulated in the Southern Delivery System EIS. More information regarding reservoir components can be found in Chapter 3 of the AVC EIS and the Southern Delivery System Model Documentation Report.

Base Model Construction

The MODSIM software package used by the Daily Model is a generalized network flow model. Because of its general nature, the application of this model to the Arkansas River Basin requires use of both the built-in functionality of MODSIM, as well as several custom constructs developed by "customizing" MODSIM using specialized PERL code. This section of the documentation details how Arkansas River Basin operations were simulated in the Daily Model using the MODSIM software package.

General MODSIM Representation

The Daily Model simulates the Arkansas River Basin from its headwaters through the Arkansas River at Las Animas gage, including major tributaries and sub-tributaries. Explicitly modeled reaches include those major reservoirs, inflows, diversions, and exchanges as described in previous sections.

The Daily Model is driven by time-series inflow and demand data contained at model nodes, water rights information contained in the links and reservoir storage information contained at reservoir nodes. The model simulates basin operations on a daily time step by moving inflows and stored water to demands using the priority information contained in the links and other physical and operational constraints found in both links and nodes. The following sub-sections provide descriptions of the model's representation of the basin.

Typical Link-Node Representation

Consistent with the general network flow approach of the MODSIM software package, the Arkansas River Basin is represented within the Daily Model as a collection of links and nodes. Nodes generally represent locations of inflows, points-of-diversion, storage facilities, and other demands, such as instream flow requirements. Links connect nodes, and contain water rights priorities, system losses, and conveyance constraints (such as capacities). In general, the nodes contain most of the inflow, storage, and demand data, while the links contain operational data. A general link-node representation of the basin superimposed on a screen-shot of the MODSIM graphical user interface Windows interface is shown in Figure 3. A full size (36" X 60" pdf) Adobe® version of the Daily Model schematic is available upon request and on the AVC EIS website http://www.usbr.gov/avceis.

Additions made to the Daily Model graphical user interface to simulate AVC EIS alternatives include:

- Arkansas Valley Conduit pipeline, including a Pueblo Dam intake and a Moffat Street intake
- Demand nodes to represent AVC participants (larger demands will be individually simulated and the other entities' demands will be lumped by county)
- Return flows for AVC participants
- No action facilities and operations
- Existing and future wells, including well depletion and augmentation sources
- Master Contract accounts for each Master Contract participant
- Additional constructs to explicitly simulate Master Contract water supplies
- Master Contract demands

Other non-AVC specific additions to the graphical user interface include an exchange construct to represent releases from Pueblo Reservoir to Colorado Canal for the Board of Water Works of Pueblo, and a construct to simulate the operation of Pueblo West's sewered return flow exchange, as their original pump-back construct from Pueblo Reservoir will not be utilized.

The proposed Interconnect between the South and North outlets at Pueblo Dam is included as a link in the Daily Model, but its use will not be simulated as it is intended for system redundancy during maintenance or emergency events. If the interconnect is not sized to deliver peak flow for all participants at the same time, then it is likely that routine maintenance activities would be performed at times when entities were not delivering peak flow (i.e. winter and spring months), and thus use of the interconnect would not affect deliveries to any entity. Although it is possible that emergencies could occur during peak flow conditions, emergency events are unknown and thus difficult to simulate in the Daily Model. The interconnect is not anticipated to affect flow in the Arkansas River or Pueblo Reservoir storage contents.

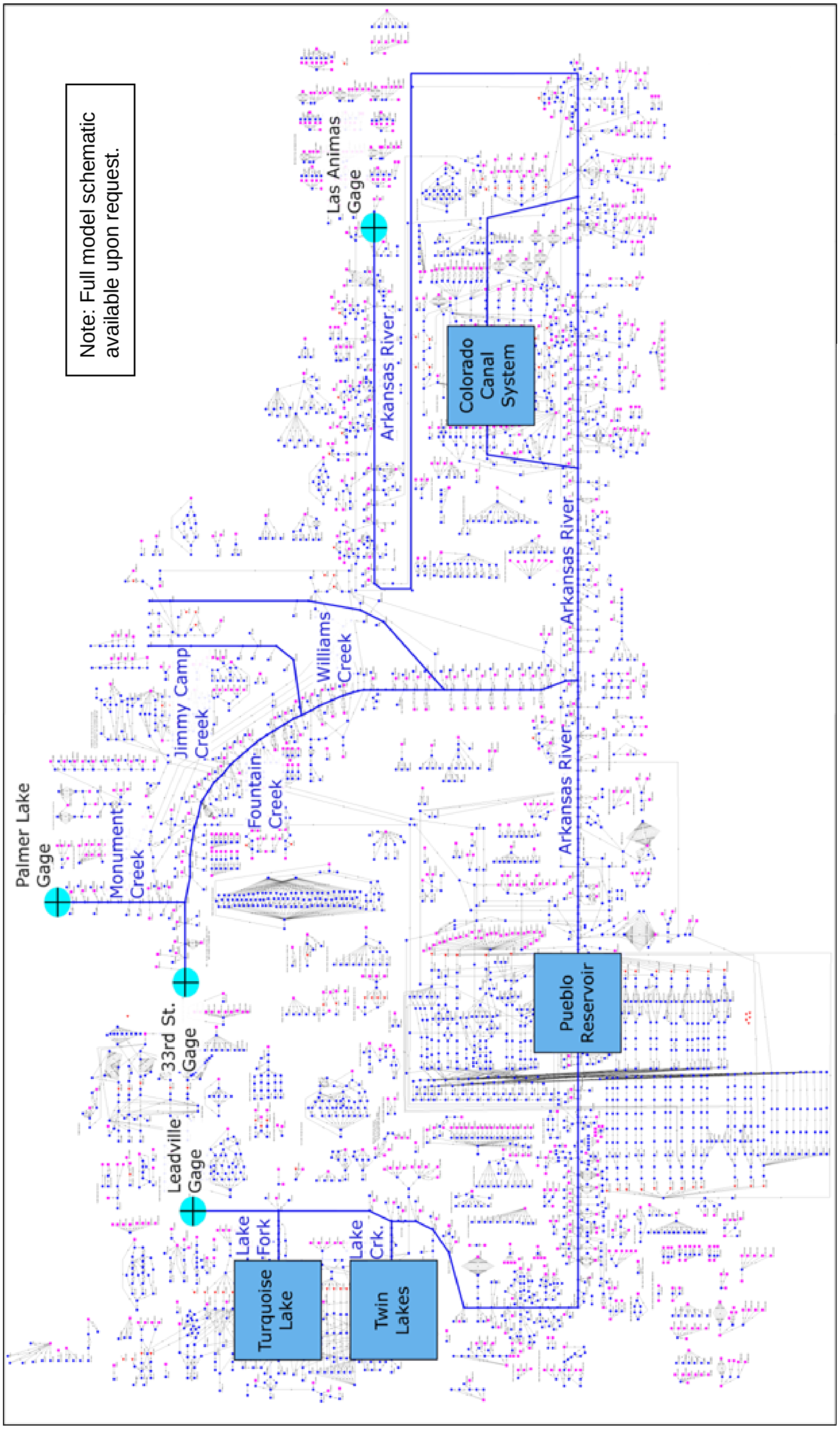

Figure 3. **MODSIM Schematic - General Daily Model MODSIM Schematic**

Daily Model Nodes

The Daily Model nodes are comprised of inflow (or general) nodes, demand nodes, and reservoir nodes. Each of these nodes serves specific functions in the model and has unique characteristics. A description of the application of each node type for use in the model is described in the Southern Delivery System Documentation.

A summary of inflow nodes in the Daily Model is shown in Table 15 and Table 16, while a summary of demand nodes is shown in Table 17 and Table 18. Due to the complexity in storage operations within the Arkansas River Basin, reservoir accounting within the Daily Model is fairly complex for most reservoirs. Later sub-sections of this document and the Southern Delivery System Model Documentation further discuss reservoir nodes and their specific accounting constructs.

Table 15. Arkansas River Basin Inflow Nodes

Node Name	Node Description
Ark_Lead	Arkansas River headwaters inflow (note: includes Columbine, Ewing, and Wurtz ditches)
LkFkNat	Lake Fork native inflows
Node075G	Ungaged gains at Node 075 (typical)
TurqIncIn	Turquoise Lake incremental inflows (downstream from Lake Fork Creek below Sugar Loaf Dam gage)
HalfmoonNat	Halfmoon Creek inflows
LkCkNat	Lake Creek native inflows
TwinIncIn	Twin Lakes incremental inflows (downstream from Lake Creek below Twin Lakes gage)
ClCkNat	Clear Creek Reservoir native inflow
CottCk	Cottonwood Creek inflows
ChalkCk	Chalk Creek inflow
SFArk	South Fork Arkansas River inflows
FourMile	Four Mile Creek inflows
BeavCk	Beaver Creek inflow
MinnRet	Minnequa Ditch return flows
CommRet	Comanche Power Plant return flows
StChRiv	St. Charles River inflows
Huerfano	Huerfano River inflows
ChicCk	Chicosa Creek inflow
Apishapa	Apishapa Creek inflow
DyeXRel	Dye Reservoir exchange releases
Timpas	Timpas Creek inflows
HolXRel	Holbrook Exchange releases
CrookAy	Crooked Arroyo inflows

Table 16. Fountain Creek Basin Inflow Nodes

Node Name	Node Description
MC_PalmLk	Monument Creek inflow at Palmer Lake
WMC_USAFA	West Monument Creek inflows
CottCkPike	Cottonwood Creek inflows (to Monument Creek)
FC_33rd	Fountain Creek inflows
CampCk	Camp Creek inflow
BearCk	Bear Creek inflow
Cheyenne	Cheyenne Creek inflow
JCC##G	Jimmy Camp Creek inflow nodes
WC##G	Williams Creek inflows nodes
Lil_FC	Little Fountain Creek Inflows

Table 17. Arkansas River Basin Demand Nodes

Node Name	Node Description
Node075L	Ungaged Loss demand (typical)
Otero_Aur [(1)]	Homestake Pipeline demand – Aurora
Otero_CSU [(1)]	Homestake Pipeline demand - Colorado Springs
FAW_DemBV	Fry-Ark municipal demand - Entities West of Pueblo near Buena Vista
FAW_DemSa	Fry-Ark municipal demand - Entities West of Pueblo near Salida
SoCanon	South Cañon Ditch demands
PSDem	City of Poncha Springs
SalDem	City of Salida
UADem	Upper Arkansas Water Conservancy District
CCHyd	Cañon City Hydraulic Ditch demand
FAW_DemCC	Fry-Ark municipal demand - Entities West of Pueblo near Cañon City
CCWW	Cañon City Water Works demand
OilCk	Oil Creek Ditch demand
FrCoDit	Fremont County Ditch demand
MinnDiv	Minnequa Canal demand
Bess	Bessemer Ditch demand
FloDem	City of Florence
PenDem	City of Penrose
PBWW_WRTot	All demands using Board of Water Works of Pueblo water rights, including the Board of Water Works of Pueblo WTP and Comanche Power Plant Pump Station
PblWest	Pueblo West demand
Various Nodes [(2)]	Fountain Valley Authority Conduit
WestPbl	West Pueblo Ditch demands
HampBell	Hamp Bell ditch demand
RivDairy	Riverside Dairy demand
WestPlDiv	West Plains Energy demands
AVC_PbDem	Pueblo County AVC Group
StChPump	St. Charles Mesa Pumping Plant demands
BoothOrc	Booth Orchard demand
CFI_RF	CFI Return Flow demands (flows through immediately downstream)
Excelsior	Excelsior Ditch Demand
Collier	Collier Ditch demand
CCD_Total [(3)]	Colorado Canal diversions
RFHighline	Rocky Ford Highline Canal demand
Oxford	Farmer's Oxford Ditch demand
AVC_FowDem	Otero County - Fowler Regionalization Unit AVC Group
OteroD	Otero Ditch demands
OlneySpgs	Olney Springs demand
Catlin	Catlin Canal demand
Holbrook	Holbrook Canal demand
Hol_Restoration-of-Yield StorageIn [(4)]	Deliveries to Holbrook Restoration-of-Yield Storage

Table 17. Arkansas River Basin Demand Nodes (cont.)

Node Name	Node Description
AVC_CrowDem	Crowley County AVC Group
RockyFord	Rocky Ford Ditch demand
FLStorage	Fort Lyon Storage Canal demand
AVC_RFDem	Otero County - Rocky Ford Regionalization Unit AVC Group
FtLyon	Fort Lyon Canal demand
AVC_LJDem	Otero County - La Junta Regionalization Unit AVC Group
AVC_OteDem	Otero County AVC Group
LACons	Las Animas Consolidated demand
Town	Town Ditch demands
AVC_BentDem	Bent County AVC Group
Ark_LA	Arkansas River at Las Animas demand
Ark_Drain	Arkansas River at Las Animas – Excess flows

Notes:

(1) Demands through the Otero Pump Station and Homestake Pipeline are represented by numerous demand nodes representing storage accounts in Turquoise Lake and Twin Lakes. Node name shown is the link name representing Otero Pump Station deliveries.

(2) The Fountain Valley Authority Conduit system is represented by numerous demands such as Colorado Springs, Fountain, Security, Widefield, and Stratmoor Hills.

(3) The Colorado Canal system is represented by numerous demands that represent the types of water diverted into the canal. Node name shown is the link name representing Colorado Canal diversions.

(4) Diversions to Holbrook Restoration-of-Yield Storage only. Node name shown is the link name representing Colorado Canal diversions.

Table 18. Fountain Creek Basin Demand Nodes

Node Name(1)	Node Description
Pike_Div	Colorado Springs Pikeview Diversion structure
Ab33_Div	Changes in flow at the Arkansas River near Colorado Springs gage (33rd St. gage) due to upstream Colorado Springs operations
33rd_Div	Colorado Springs 33rd Street Pump Station Diversion structure
FMIC	Fountain Mutual Irrigation Company demand
SHDem	City of Stratmoor Hills
Stubbs	Stubbs & Miller Ditch demand
WidDem	City of Widefield
Chilcotte	Chilcotte Ditch demand
Crabb	Crabb Ditch demand
Lock	Lock Ditch demand
Lock2	Lock Ditch No 2 demand
Liston	Liston and Love Ditch demand
Owen	Owen and Hall Ditch demand
Reed	Reed Ditch No 2 demand
Talcott	Talcott & Cotton Ditch demand
Dr_Ditch	Dr. Rogers demand
Jax	Jackson and Burke Ditch demand
Burke	Burke Ditch demand
Toof	Toof & Harmon Ditch demand
Young	Young and Callaway Ditch demand
Wd_Valley	Wood Valley Ditch demand
Hobson	Hobson Ditch demand

Notes:

(1) Colorado Springs' existing demand points are not included in this table because they are located upstream from the model area.

Links

Links can generally be classified into four types: direct flow, storage accrual, storage ownership, and reservoir outflow. Each of these link types and the data associated with them is discussed in the Southern Delivery System Model Documentation Report.

Demand Methods

Diversions from the river to meet demands are a function of the entity's estimated demand, water rights, and storage ownership. This section discusses the simulation of the demand portion of this function for both agricultural and municipal entities.

Agricultural Demands

Agricultural demand constructs are designed to simulate the demand at the point-of-diversion, limited by water rights and storage ownership. For purposes of the Daily Model simulations, historical demands were used. The general advantages and disadvantages of this approach are discussed in the Southern Delivery System Model Documentation Report. Most major agricultural diversions divert a portion of their water from storage. Because of this, any additional water left in the river as a result of AVC alternatives will primarily result in less water pulled from storage, not greater diversions. Although it is acknowledged that the agricultural diversions may divert higher amounts of water under native water rights than what is pulled from storage, determination of these amounts is beyond the scope of the AVC modeling. Thus any additional water made available by alternatives will primarily result in increased storage contents in reservoirs, which can then be delivered to water users as determined through Daily Model operations.

Municipal Demands

To adequately simulate future river conditions, a municipal demand method was developed to allow the user to input demand levels, either directly as an annual volumetric demand or from demand schedules. The demand simulation method varies by entity, and is further discussed in this section for entities specific to the Daily Model. Several Municipal participants have proposed various supplies to meet their future demand. The following is a list of potential municipal water supplies, and their priority of use in meeting future participant demand in Daily Model simulations. The priority ensures that other supplies will be used in preference to Lower Ark District supply.

- Existing usable supplies (as defined by EIS Purpose and Need)
- Fry Ark return flows
- Participant's Master Contract storage
- Fry Ark First Use water
- Lower Ark District Supply

Poncha Springs/Salida/Upper Arkansas Water Conservancy District

Poncha Springs, Salida, and Upper Arkansas Water Conservancy District (Upper Ark District) predominately use alluvial groundwater to meet demand, which can be specified in the input file. Poncha Springs and Salida demand is simulated at the confluence node of the Arkansas River and South Arkansas River. The Upper Ark District demand is simulated at a node between Salida and the Arkansas River near Wellsville gage, as this where their service district predominantly lies. Depletions caused by groundwater pumping are simulated on the Arkansas

River and are lagged over a one day period. The lag pattern is a simplistic assumption, but will not affect the overall results of the model. All depletions are assumed to be out of priority and require augmentation. Augmentation supplies include return flows and surface water and storage supplies, as discussed in prior sections. The MODSIM representation of these entities is shown in Figure 4.

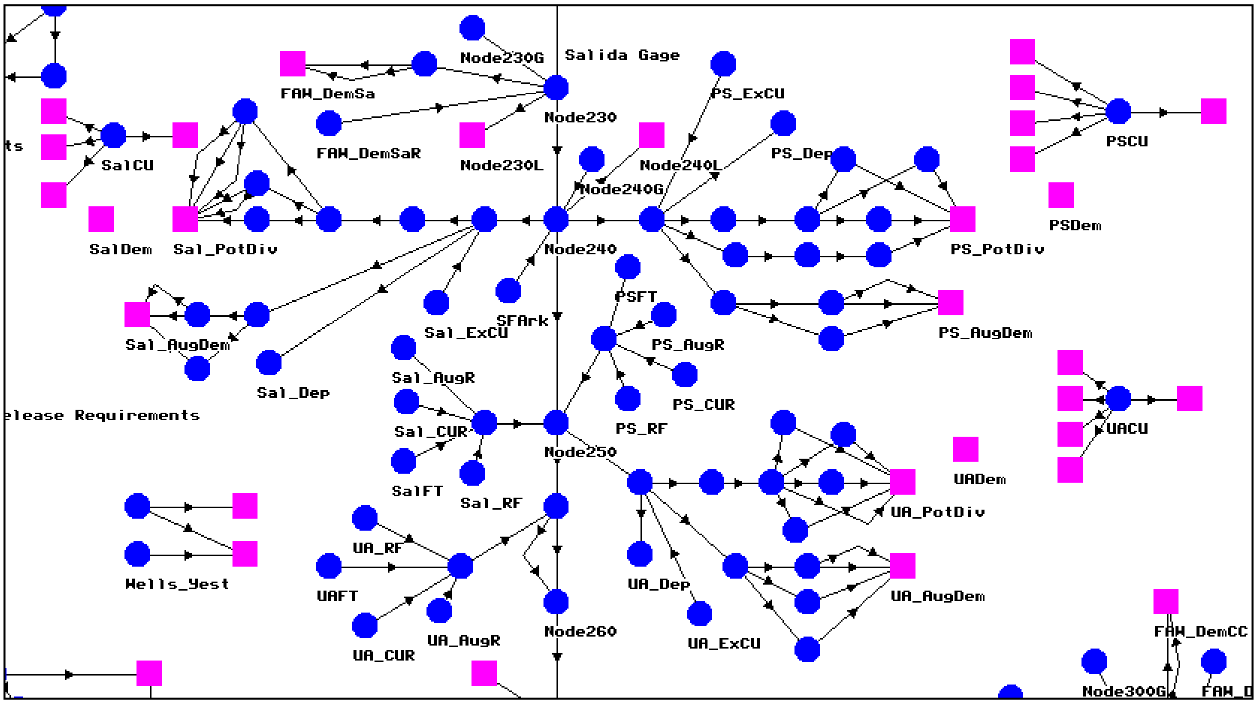

Figure 4. MODSIM Schematic – Poncha Springs, Salida, Upper Arkansas Water Conservancy District

Cañon City

The Cañon City demand was originally included in the Southern Delivery System version of the Daily Model. The Cañon City demand is described in the Daily Model with all pertinent surface water rights and storage rights. The user can specify Cañon City demands in the input file.

Florence/Penrose

Florence and Penrose demands work similarly to Cañon City demands. Demand is met first with direct flow surface water rights, followed by excess capacity storage and Fry-Ark Project allocations. The MODSIM representation of these entities is shown in Figure 5.

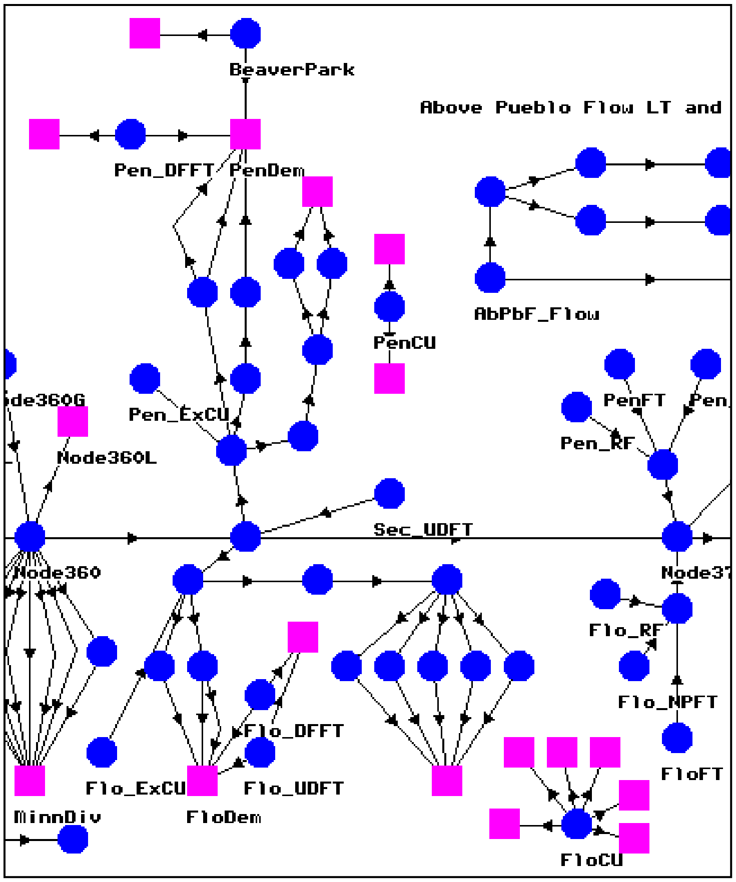

Figure 5. **MODSIM Schematic – Florence and Penrose**

Pueblo West

Pueblo West demand was originally included in the Southern Delivery System version of the Daily Model. Pueblo West demands work similarly to Cañon City demands, except that a non-tributary groundwater pumping node is added to the construct to represent groundwater pumping that will be required to supplement surface water rights during dry years, if surface water rights are inadequate to meet demands. The demand node is described in the Daily Model with all pertinent water rights and storage rights. The user can specify Pueblo West demands in the input file.

Fountain/Security

Full demands of both surface water and groundwater by Fountain and Security are simulated in the Daily Model, and were included in the original Southern Delivery System version of the Daily Model. The model is constructed to first use these entities' allocation of the Fountain Valley Authority, then supplement this use with excess capacity storage, allocations from the Southern Delivery System, and groundwater. Groundwater is only used if surface water supplies are inadequate to meet demands. The user can specify demands in the input file. The MODSIM representation of these entities is shown in Figure 6.

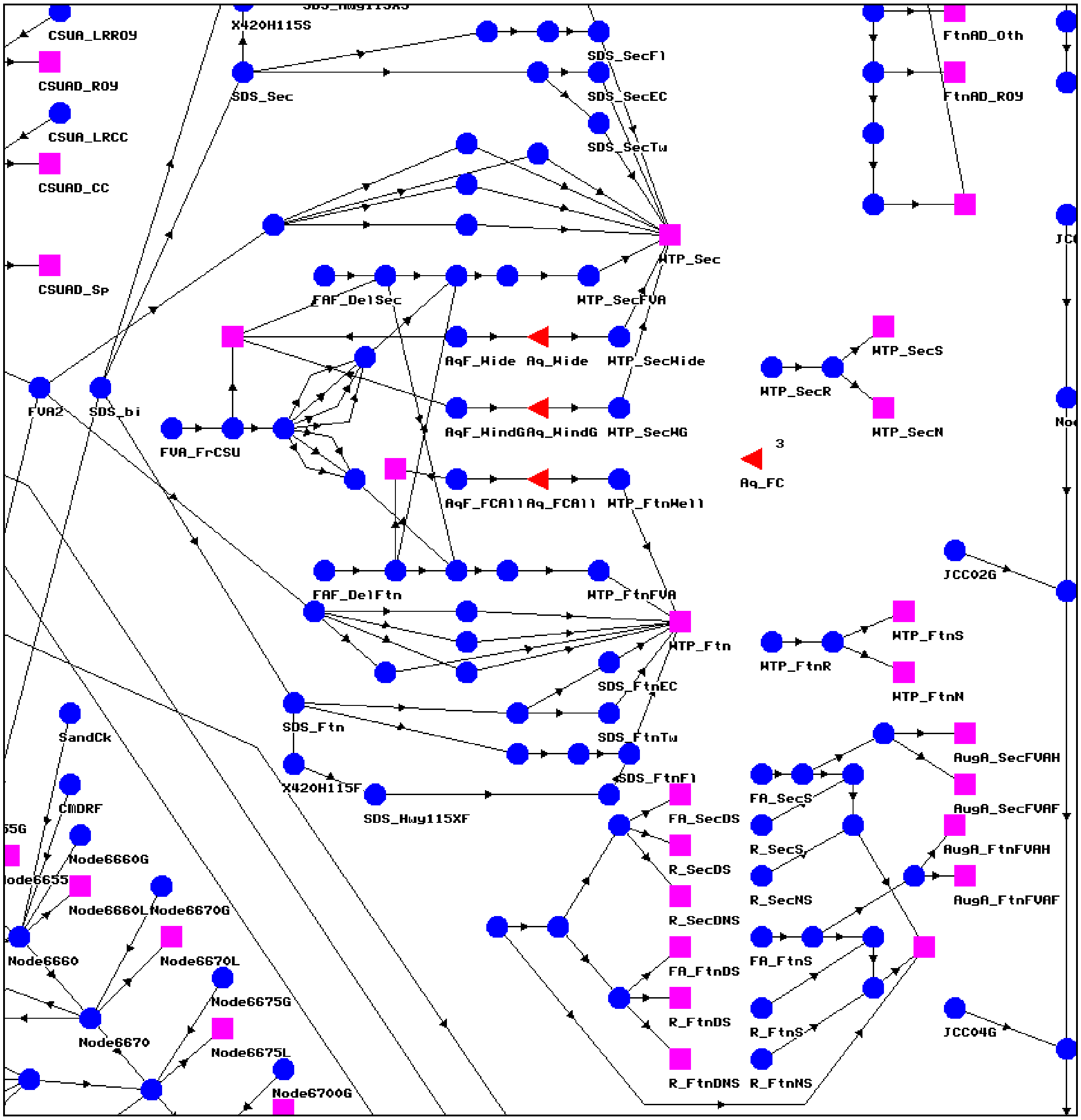

Figure 6. MODSIM Schematic – Fountain and Security

Widefield/Stratmoor Hills

Full demands of both surface water and groundwater by Widefield and Stratmoor Hills are simulated in the Daily Model. The model is constructed to first use these entities' allocation of the Fountain Valley Authority, then to supplement this use with excess capacity storage and groundwater. Groundwater is only used if surface water supplies are inadequate to meet demands. The user can specify demands in the input file. The MODSIM representation of these entities is shown in Figure 7.

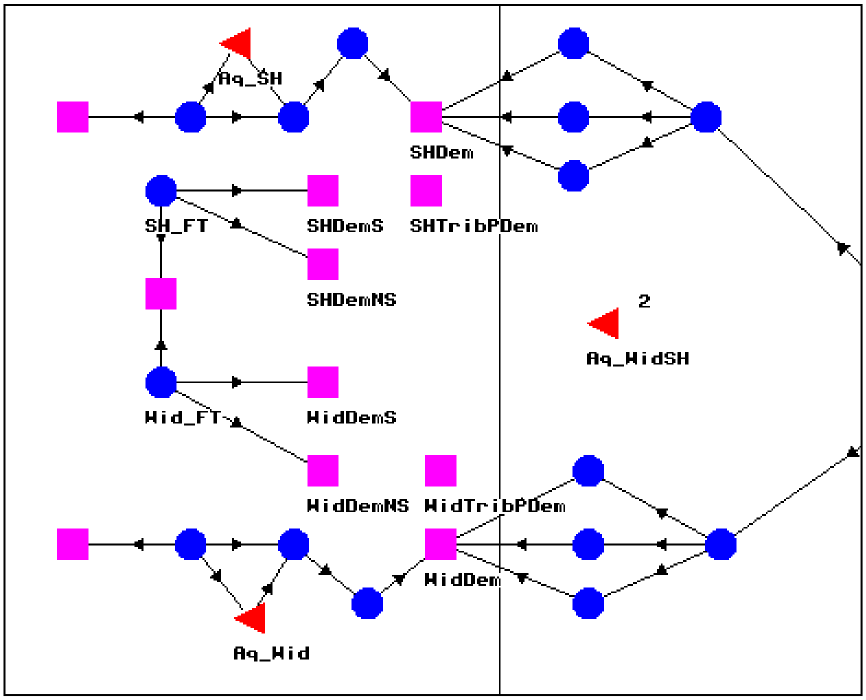

Figure 7. MODSIM Schematic – Widefield and Stratmoor Hills

Lower Arkansas Valley Water Conservancy District

The Lower Ark District representation in the Daily Model is unique in that it supplies water to other municipal and agricultural demands, not to a dedicated Lower Ark District demand. The following entities have been identified by the Lower Ark District as potential recipients (lessees) of the water stored in the Master Contract storage space (Lower Ark District 2011).

- Fountain Valley Authority (Fountain Valley Authority) – Many Fountain Valley Authority Master Contract participants have identified the Lower Ark District as a potential source of water to meet 2070 demands, including the cities of Fountain, Security, and Widefield. Constraints in conveyance facilities (e.g. Fountain Valley Conduit, Southern Delivery System) may limit Lower Ark District deliveries, although all of these participants have their own Master Contract storage space to which water could be transferred and stored for later use.

- AVC participants – Several AVC participants have specifically identified the Lower Ark District as a source of non-Project water supply. Other participants have a gap between identified supplies and 2070 demands, and it is assumed that Lower Ark District supplies will fill these gaps. Conveyance constraints are not anticipated as the AVC is sized according to identified percentages of demand to be met with Project and non-Project water AVC deliveries.

- Upper Arkansas Water Conservancy District (Upper Ark District) – The Upper Ark District is located upstream from Pueblo Reservoir, and provides water supplies and augmentation water for residential, commercial, industrial, agricultural use. Constraints in exchange potential in the upper Arkansas River basin may limit Lower Ark District deliveries to the Upper Ark District. The Upper Ark District is also requesting Master Contract storage space, so Lower Ark District supplies could be transferred to Upper Ark District storage for exchange at a time when storage space is available.

- Surface Water Irrigation Improvements Rule 10 – The Lower Ark District has been identified as a supply for Rule 10 water. In this EIS, Lower Ark District water associated with Rule 10 requirements will be limited to a portion of Lower Ark District's Master Contract storage that will be dedicated to releases to meet Rule 10 obligations.

- Seep Ditches – Seep ditches are decreed water rights for diverting from drainage ditches associated with agriculture runoff. It is anticipated that future out-of-priority diversions from seeps ditches will require augmentation water supplies. Similar to Rule 10 supplies, this supply will be limited to a portion of Lower Ark District's Master Contract storage that will be dedicated to releases to meet Seep Ditch obligations.

The annual Lower Ark District storage demand of these participants in shown in Table 19. In the AVC Daily Model, these above participants can access Lower Ark District storage to meet demand after all other supplies are exhausted. Lower Ark District storage does not require a transfer to another excess capacity account; rather it is delivered directly to the participant's demand or augmentation node.

Based on responses to Master Contract questionnaires and subsequent communication provided by the Lower Ark District, use of water proposed for storage in Lower Ark District Master Contract storage space will be limited to the above identified participants. Other potential water supplies and recipients, such as Super Ditch leases to Aurora and other entities outside of the Southeastern Colorado Water Conservancy District (Southeastern District) boundaries, are not analyzed in the EIS.

Table 19. Lower Arkansas Valley Water Conservancy District Master Contract Storage Leases

Lessee	Maximum Annual Lease (ac-ft)
Fountain Valley Authority	4,000
AVC participants	800
Upper Arkansas Water Conservancy District	1,000
Rule 10 Demand and Seep Ditches	2,000

AVC Participants

Demands for the AVC participants are grouped in the Daily Model by county, or by regionalization unit, as described in Chapter 2. This grouping (see Table 20) facilitates simulation of the large number of relatively small demands in the Daily Model. Grouping demands, however, could enable participants that do not have Master Contract storage or sufficient supplies to meet demand to utilize group storage accounts and supplies. This could result in an underestimation of Fry-Ark and leased water utilization (e.g. Lower Ark District leases). AVC participants without Master Contract storage accounts and participants with anticipated supply shortages are small, so this effect of grouping is expected to be minor. The group demands in the model are situated along the Arkansas River near their respective participant locations. The AVC groups predominately use alluvial groundwater to meet current demand. The Pueblo County group is the exception in that St. Charles Mesa Water District has several surface water diversions into their system.

The Daily Model splits the group demands into two nodes, one for AVC deliveries (or surface water deliveries in the case of the Pueblo Group in non-AVC alternatives), and the other for groundwater supplies. The purpose of this split is to restrict AVC deliveries to the specified demand. All remaining total participant demand is input into the groundwater node and is met using existing groundwater supplies. Table 21 lists the annual participant demand by group and alternative. The annual demands for AVC deliveries and existing use of groundwater are further described in Chapter 1 and Appendix A of the EIS.

Depletions caused by groundwater pumping are simulated on the Arkansas River and is lagged over a one day period. This lag pattern is a very simplistic assumption, but will not affect the overall results of the model. All depletions are assumed to be out of priority and require augmentation. Augmentation supplies include return flows, surface water and storage supplies, as discussed in prior sections. The AVC will be used to meet most of future demand, as described in the AVC section below.

Table 20. Daily Model Demand Groups for AVC Participants

AVC Group	Participant
Pueblo County	Avondale
	Boone
	St. Charles Mesa Water District
Otero County - Fowler Regionalization Unit	Fowler
	Valley Water Co.
Otero County - Rocky Ford Regionalization Unit	Rocky Ford
	Hancock Inc.
	Hilltop Water Co.
	Vroman
	West Grand Valley Water Inc.
Otero County - La Junta Regionalization Unit	La Junta
	Bents Fort Water Co.
	Cheraw
	East End Water Assn.
	Holbrook Center Soft Water
	Homestead Improvement Assn.
	Swink
Otero County	Beehive Water Assn
	Eureka Water Co.
	Fayette Water Assn.
	Manzanola
	Newdale-Grand Valley Water Co.
	North Holbrook Water
	Patterson Valley
	South Side Water Assoc.
	South Swink Water Co.
	West Holbrook Water
Crowley County	96 Pipeline Co.
	Crowley County Water Assoc.
	Crowley
	Ordway
	Olney Springs
	Sugar City
Bent County	Las Animas
	Hasty Water Company
	McClave Water Assoc.
Prowers County	Lamar
	May Valley Water Assoc.
	Wiley
Kiowa County	Eads

Table 21. AVC Participant Demand by Group

AVC Group	Total Annual Demand (ac-ft)	Surface Water Demand		Groundwater Demand	
		AVC Demand (ac-ft)	River Diversion (ac-ft)	Alluvial Wells Demand (ac-ft)	Deep Wells Demand (ac-ft)
Existing Conditions					
Pueblo County	1,886	0	1,460	426	0
Otero County - Fowler Regionalization Unit	248	0	0	210	38
Otero County - Rocky Ford Regionalization Unit	1,009	0	0	900	109
Otero County - La Junta Regionalization Unit	2,225	0	0	2,068	157
Otero County	319	0	0	29	290
Crowley County	1,032	0	0	907	125
Bent County	658	0	0	570	88
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,834	0	0	2,579	255
Kiowa County	250	0	0	250	0
Total	**10,461**	**0**	**1,460**	**7,939**	**1,062**
No Action Alternative					
Pueblo County	3,000	0	2,451	549	0
Otero County - Fowler Regionalization Unit	262	0	0	262	0
Otero County - Rocky Ford Regionalization Unit	1,166	0	0	1,167	0
Otero County - La Junta Regionalization Unit	2,652	0	0	2,652	0
Otero County	361	0	0	40	322
Crowley County	1,571	0	0	1,206	366
Bent County	705	0	0	602	103
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,620	0	0	2,157	463
Kiowa County	232	0	0	232	0
Total	**12,569**	**0**	**2,451**	**8,867**	**1,253**
Action Alternatives					
Pueblo County	3,000	2,909	0	91	0
Otero County - Fowler Regionalization Unit	262	259	0	2	0
Otero County - Rocky Ford Regionalization Unit	1,166	686	0	465	15
Otero County - La Junta Regionalization Unit	2,652	2,503	0	122	27
Otero County	361	351	0	0	11
Crowley County	1,571	1,247	0	281	0
Bent County	705	694	0	0	11
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,620	1,491	0	916	213
Kiowa County	232	116	0	116	0
Total	**12,569**	**10,256**	**0**	**1,993**	**277**

Demands Downstream from Model Area

In addition to those specific demands within the model area, the Daily Model must contain a method to account for the water rights calls and deliveries made to demands downstream from the model area. Therefore, the model is constructed to always meet historical flows at the Arkansas River at Las Animas gage. In order to simulate calls downstream from the Arkansas River at Las Animas gage, two nodes are used to calculate flows at the Arkansas River at Las Animas gage:

- Demand node “Ark_LA.” The link into this node is set as the highest priority in the system. This means that demands at the demand node must be met at the expense of all other demands in the basin. Demands at this node are generally set at historical flows and diverts only native streamflow (including native return flows).

- Demand node “Ark_Drain”, which is a dummy node with a low priority that demands any “excess” flow in the river to maintain mass balance. Any flows in the river that exceed demands at the Arkansas River at Las Animas gage demand node will flow into the drain node and be counted as flow at the Arkansas River at Las Animas gage.

For the existing conditions and future conditions scenarios, the demands at the Arkansas River at Las Animas gage node are reduced during times when the historical call was junior to the John Martin Reservoir water right priority (12/14/1948) to the minimum of the Arkansas River below John Martin Reservoir gage flow or 1,250 cfs, whichever is less. By reducing demands during the junior call periods, the Daily Model allows the water rights priorities that are built into the Daily Model to distribute water to junior priorities. For the calibration model run, no adjustments were made, and the Arkansas River at Las Animas gage demands were set at the historical flow (MWH 2008a).

An underlying assumption of the Daily Model is that the simulated decrees for any changed water rights (changes-in-use, alternate points-of-diversion and exchanges) were developed and are operated in a manner that would not injure senior water rights or the ability of Colorado to meet terms of the Arkansas River Compact. Therefore, simulated diversions for water rights are curtailed according to Colorado Water law when flow is insufficient and historical flow at Las Animas is maintained.

Reservoir Operations

Because of their multiple accounts, inflow sources and use for exchanges, reservoir operations simulation for most reservoirs in the basin are fairly complex. The standard MODSIM parent-child reservoir constructs are generally used to simulate the reservoirs and associated accounts. The reservoir as a whole is the “parent reservoir” and each account within the reservoir is represented by a “child reservoir.” The setups for the most complex reservoirs in the system are found in the Southern Delivery System EIS Model Documentation Report. Changes to operations specific to the AVC EIS are detailed below.

Pueblo Reservoir

Because of its location in the basin and its importance to Fry-Ark, the Winter Water storage program, and exchange operations, Pueblo Reservoir is the "keystone" facility in the Daily Model. Simulation of Pueblo Reservoir operations is also complex for these same reasons. Pueblo Reservoir is located on the Arkansas River upstream from the City of Pueblo. The single source of inflows to Pueblo Reservoir is the Arkansas River, along with very minor localized incidental inflows. Releases from the reservoir to the Arkansas River go through the river outlet works, including most releases made for agricultural entities. Releases to the Board of Water Works of Pueblo, Fountain Valley Conduit, Pueblo West and Pueblo Fish Hatchery are through the existing South Outlet Works. Releases to the Bessemer Ditch are through a separate, dedicated, existing outlet structure. Future deliveries to the Southern Delivery System will be made via a pipeline connection to the North Outlet Works that is under construction.

Storage Accounts

The only "firm" accounts in Pueblo Reservoir are Fry-Ark Project accounts. Remaining accounts are "excess capacity" accounts that can only be used when space is available. Each of the Fry-Ark accounts, the Winter Water account and the excess capacity accounts (including Master Contract accounts) are modeled as separate accounts in the reservoir. Although this appears to allow more storage than what is physically available in the reservoir, accounting is performed that spills water out of excess capacity accounts according to the spill priorities when excess space is unavailable. This accounting is described later in the documentation. A summary of the simulated reservoir accounts is shown in Table 22.

The flood control account in Pueblo Reservoir is used only during flooding conditions. A maximum capacity link is set on the Arkansas River immediately upstream from the Arkansas River near Avondale gage. Anytime that flow exceeds 6,000 cfs at this location, water will be stored out of priority in the flood control pool (after all other accounts are full). This water is then released when flows are less than 6,000 cfs.

Table 22. Simulated Storage Accounts in Pueblo Reservoir

System	Storage (ac-ft)	Account	Node
Fry-Ark Project Accounts			
Dead/Inactive	28,121	Dead/Inactive	Pbl_Inact
Fry-Ark Project	228,828	Fry-Ark Project	Pbl_FA
Sub-Total	256,949		
Joint-Use	66,000	Joint-Use	(2)
Flood Control	26991	Flood Control	Pbl_Flood
Total	349,940		
Excess Capacity Accounts (1)			
Winter Water	70,000	Winter Water	Pbl_WW
Excess Capacity	15,000	Board of Water Works of Pueblo	PblEC_PBWW
	(1)	Pueblo West	PblEC_PblW
		Colorado Springs	PblEC_CSU
		City of Aurora	PblEC_Aur
		City of Fountain	PblEC_Ftn
		Security Water and San. District	PblEC_Sec
Excess Capacity – Master Contract	(1)	Pueblo County AVC Group	PblEC_PbAVC
		Otero County - Fowler Regionalization Unit AVC Group	PblEC_FowAVC
		Otero County - Rocky Ford Regionalization Unit AVC Group	PblEC_RFAVC
		Otero County - La Junta Regionalization Unit AVC Group	PblEC_LJAVC
		Otero County AVC Group	PblEC_OteAVC
		Crowley County AVC Group	PblEC_CrowAVC
		Bent County AVC Group	PblEC_BentAVC
		Prowers County - Lamar Regionalization Unit AVC Group	
		Kiowa County AVC Group	
		City of Poncha Springs	PblEC_PSMC
		City of Salida	PblEC_SalMC
		Upper Arkansas Water Conservancy District	PblEC_UAMC
		City of Cañon City	PblEC_CCMC
		City of Florence	PblEC_FloMC
		City of Penrose	PblEC_PenMC
		Pueblo West	PblEC_PblWMC
		City of Stratmoor Hills	PblEC_SHMC
		City of Widefield	PblEC_WidMC
		City of Fountain	PblEC_FtnMC
		Security Water and San. District	PblEC_SecMC
		Lower Arkansas Valley Water Conservancy District	PblEC_LAMC
Sub-Total			

Note:
(1) Excess Capacity accounts for Pueblo Reservoir only shown here. Consult documentation on specific alternative to determine size of account simulated. Excess capacity accounts are non-firm accounts, subject to spill according to the spill priorities by Fry-Ark project water.
(2) A separate account is not used for joint-use storage. The Daily Model only simulates Winter Water and excess capacity accounts using the joint-use pool. The joint-use pool is reserved for flood storage from April 15 through November 1.

Inflows

The only inflows to Pueblo Reservoir are flows from the Arkansas River and local tributary flows directly into the reservoir. This water can be made up of both native Arkansas River flows, transmountain imports that are owned by specific entities, and reusable return flows that are owned by specific entities. The rights to store water in Pueblo Reservoir consist of Pueblo Reservoir native water rights, ownership of transmountain imports or reusable return flows, and storage by exchange. Water rights and ownership of non-native water (i.e. transmountain imports and reusable return flows stored by exchange) are coded in the inflow links into Pueblo Reservoir.

A complete list of water rights that were identified for storage in Master Contract excess capacity accounts and the Daily Model links that simulate those water rights is contained in Appendix A. The Master Contract participants that would also have long-term excess capacity storage contracts as part of the Southern Delivery System (Pueblo West, Fountain and Security) have identified several water rights for the Master Contract that were also identified for storage in the Southern Delivery System accounts. For purposes of the Daily Model, water rights that were identified for storage in the Southern Delivery System accounts are always stored in those accounts first. If the Southern Delivery System accounts fill, then these water rights are stored in Master Contract accounts. Any water rights that are identified for storage in the Master Contract but not identified for storage in the Southern Delivery System accounts are only stored in Master Contract accounts.

Releases

Releases from Pueblo Reservoir are made for several purposes. A portion of those releases are made to the Arkansas River through the river outlet works, while other releases are made from various other outlet works directly from the reservoir. Although MODSIM schematically shows these as diversions downstream from the reservoir, they are modeled as releases directly from the dam.

- Bessemer Ditch Outlet Works – These releases include those for the Bessemer Ditch and those diversions for the St. Charles Mesa Water District that are conveyed through the Bessemer Ditch.

- South Outlet Work (Municipal Outlet Works) – These releases include municipal releases through the Joint-Use Manifold and the Joint-Use Pipeline. Pueblo West and the Fountain Valley Conduit divert from the Joint-Use Manifold upstream from the Joint-Use Pipeline. The Board of Water Works of Pueblo and the proposed Southern Delivery System diversion divert from the Joint-Use Pipeline downstream from the Joint-Use Manifold. The proposed AVC diversion diverts from the Joint-Use Manifold or the Joint-Use Pipeline downstream from the Joint-Use Manifold, depending on the alternative.

- River Releases - River releases are those releases that flow through the links downstream from the releases made directly from the dam. River releases include native water rights downstream from the reservoir, Fry-Ark releases for downstream agricultural use, Fry-Ark releases for Entities East of Pueblo, release for the AVC river intake alternative, and other miscellaneous releases. These releases made to the river include those made as part of upstream exchanges. For purposes of the AVC EIS, a minimum release of 50 cfs river release was assumed for Pueblo Reservoir during the winter months. This prevents the Winter Water storage program from diverting too much water during the winter months and helps to meet the junior Aquila Energy water right in which non-consumptive demands are normally met, even though the priority date is junior to the Winter Water Storage Program priority date.

For Master Contract participants that also have Southern Delivery System excess capacity storage accounts, releases are always made from Southern Delivery System accounts first. This was to ensure that space is available to store water rights in the Southern Delivery System accounts which cannot be stored in Master Contract accounts.

Priorities

As previously stated, the flow of water through the Daily Model is based on the prior appropriation system, much the same as actual operations in the river basin. Although MODSIM allows priorities to be given both as link costs and node priority numbers, only the link costs system is used in the model. Link costs not only represent specific simulated water rights, but also priorities for gains and losses, project water allocations, exchanges, and other operational rules. In general, link costs are grouped as shown in Table 23. As previously stated, because the MODSIM solution algorithm seeks to minimize the sum of the link flow multiplied by the link costs, lower link costs indicate higher priorities.

Table 23. Link Cost (Priority) Groupings

Priority Numbers		Description of Use
Higher Priority	-48000 to –49999	Other miscellaneous constructs
	-47000 to –47999	Exchange links
	-43000 to –43500	Fry-Ark imports
	-40000 to –42999	Ungaged loss links
	-34000 to –39999	Other transmountain imports
	-14000 to –29999	Native water rights
Lower Priority	-100 to –9999	Storage ownership links

Transit Losses

General transit loss calculations in the Daily Model are described in the Southern Delivery System Model Documentation Report. Recently, a transit loss study was completed for the lower Arkansas River (Livingston 2011) and for Fountain Creek (U.S. Geological Survey 2006). These studies report changes in transit losses based on time of year, temperatures, reservoir release fluxes and other parameters. The transit loss component in the Daily Model is more general and consists of losses based on a percentage of flow per mile of stream. To more accurately reflect the transit losses in the Lower Arkansas River computed by Livingston 2011, the transit loss percentages were adjusted in the Daily Model.

Three separate antecedent-flow conditions were evaluated in Livingston 2011, each with four different volumes of reservoir releases from Pueblo Reservoir. The antecedent-flow conditions for the three given delivery locations were compared with Daily Model simulated flows for wet, average and dry years in a draft Existing Conditions run. The simulated flows were most similar to the antecedent-flows classified as "high" in Livingston 2011. However, to remain conservative, the transit losses for the "average" antecedent-flow conditions were chosen for use in the Daily Model. A reservoir release of 400 cfs for 10 days was chosen as the most appropriate release volume for use. The following table from the Livingston report shows the transit losses depicted with the chosen value for the Daily Model transit losses shown in bold.

Table 24. Summary and Comparison of Example Transit-Loss Determinations

Antecedent Flow Condition	Reservoir Release			Transit Loss for Indicated Delivery Point (cfs)		
	Volume (cfs)	Rate (cfs)	Duration (days)	Catlin Canal (10% Rule)	Ft. Lyon Canal (10% Rule)	John Martin (5% Rule)
Low	1,000	100	10	10.0	16.2	29.8
Low	2,000	100	20	7.1	12.5	24.0
Low	4,000	400	10	8.5	13.9	20.6
Low	8,000	400	20	6.0	10.5	15.6
Average	1,000	100	10	7.4	11.8	18.5
Average	2,000	100	20	5.4	9.1	14.6
Average (1)	**4,000**	**400**	**10**	**6.6**	**10.7**	**15.3**
Average	8,000	400	20	4.7	8.2	12.1
High	1,000	100	10	5.0	8.1	10.3
High	2,000	100	20	3.7	6.3	8.4
High	4,000	400	10	4.6	7.5	9.4
High	8,000	400	20	3.4	5.7	7.6

Source: Livingston 2011
Notes:
(1) Values used for Daily Model analysis.

To calculate the percent transit loss per mile of reach length, reach lengths in ArkExcel were revisited. Some segments were re-measured using the State's Colorado Decision Support System map viewer GIS measuring tool (Colorado Decision Support System 2010) such that the river mile distances between gaging stations identified in the Livingston report were more consistent. Table 38 shows the transit losses calculations used for the ArkExcel reaches. Transit losses for the reaches were entered into ArkExcel and the between-node reach distance was multiplied by the transit loss percent per mile value to give the channel loss coefficient for MODSIM input.

Table 25. Identification of Reaches within Model area

Reach	Upstream Gaging Station or Site	Downstream Gaging Station or Site	Distance (river miles)
1	Pueblo River Dam (represented by Arkansas River above Pueblo gage, ARKPUECO or 07099400) [1]	Arkansas River near Avondale (ARKAVOCO or 07109500)	23.0
2	Arkansas River near Avondale (ARKAVOCO or 07109500)	Arkansas River near Nepesta (ARKNEPCO)	21.0
3	Arkansas River near Nepesta (ARKNEPCO)	Arkansas River at Catlin Dam (ARKCATCO or 07119700)	17.6
4	Arkansas River at Catlin Dam (ARKCATCO or 07119700)	Arkansas River near Rocky Ford (ARKROCCO)	18.0
5	Arkansas River near Rocky Ford (ARKROCCO)	Arkansas River at La Junta (ARKLAJCO or 07112300)	14.2
6	Arkansas River at La Junta (ARKLAJCO or 07112300)	Arkansas River at Las Animas (ARKLASCO or 07124000)	27.0
7	Arkansas River at Las Animas (ARKLASCO or 07124000)	John Martin Reservoir	6.7 [2]
		Total	127.5 [2]

Source: Livingston 2011
Notes:
(1) Located about 0.3 river miles below Pueblo Reservoir Dam.
(2) Approximation due to dependency on the water level of John Martin Reservoir.

Table 26. Transit Loss Calculations for Daily Model

Transit Loss Parameter	Pueblo to Catlin Canal	Catlin Canal to Ft Lyon Canal	Ft Lyon Canal to John Martin Res
Transit Loss % [1]	6.6	4.1	4.6
ArkExcel Miles	61.6	27	38.9
Transit Loss % per Mile	0.1071	0.1519	0.1183

Notes:
(1) Transit loss for 400 cfs/10 day duration at Average antecedent flow condition (Livingston 2011)

The transit loss studies on Fountain Creek were also reviewed. The most recent study (U.S. Geological Survey 2006) is specific for transit losses on Monument Creek to analyze exchange water from the new J.D. Phillips Water Treatment Facility. As part of this study, the transit model developed in 1988 (U.S. Geological Survey 1988) was updated by the U.S. Geological Survey to include Monument Creek and new operational changes. For the purpose of the Daily Model, the 1988 study was reviewed to verify the transit losses in percent per mile used in ArkExcel. Based on this report, no changes were made to the Daily Model transit losses on Fountain Creek.

Actual historical transit losses may be greater than or less than the calculated transit losses for simulated flow. The ungaged gains and losses account for most, if not all of the transit losses not explicitly calculated by the model.

Return Flows

As previously described, the model explicitly simulates return flows from major agricultural and municipal diversions. Therefore, return flow parameters are required for each of the diversion types. Return flow ratios and other return flow data were previously discussed.

The Daily Model does not distinguish between Fry-Ark return flows from transmountain sources and Fry-Ark return flows from Eastern Slope water rights. Fry-Ark water rights are governed by terms of the Arkansas River Compact. Kansas has raised the issue of whether return flows that accrue to the Arkansas River from use of native (Eastern Slope) Arkansas River water rights should be treated the same as return flows from transmountain sources in the H-I model (the model used for Compact administration, specifically Data Set 14). By order of the Special Master, this issue remains unresolved. However, the order states "for purposes of drafting the Decree, no change should be made in Data Set 14….", in which return flows accruing from native (Eastern Slope) water rights are treated the same as transmountain water rights (i.e. fully reusable; Littleworth 2008).

It is not the intent of the AVC EIS NEPA process to settle disputes between Kansas and Colorado on the Arkansas River Compact. Therefore, in order to be consistent with the H-I model and recent orders by the special master, AVC EIS hydrologic modeling treats return flows accruing from the use of native Fry-Ark water rights as reusable to extinction.

MODSIM has a return flow accounting system built into its internal code. Therefore, simulation of return flows is fairly straightforward in the Daily Model. Several of the demand nodes, including explicitly simulated municipal and agricultural diversions, use this methodology, with return flows accruing to several locations on the river. Return flow can be potentially exchanged or delivered to excess capacity accounts in Pueblo Reservoir, or used for augmentation of groundwater pumping depletions. The actual return flow accrual nodes are shown in Table 27 and Table 28.

Table 27. Arkansas River Basin Return Flow Nodes

Node Name	Node Description
FAW_RFBV	Fry-Ark Return Flows – near Buena Vista
FAW_RFSa	Fry-Ark Return Flows – near Salida
PS_RF	City of Poncha Springs return flows
Sal_RF	City of Salida return flows
UA_RF	Upper Arkansas Water Conservancy District return flows
FAW_RFCC	Fry-Ark Return Flows – near Cañon City
CCWW_RF	Cañon City sewered and non-sewered return flows
Flo_RF	City of Florence return flows
Pen_RF	City of Penrose return flows
PblW_RFN	Pueblo West non-sewered return flows
PblFishR	Pueblo Fish Hatchery Return Flows
PblW_RFS	Pueblo West sewered return flows
PblR_R0	Pueblo non-sewered return flows - Reach 0
WestPlRet	West Plains Energy Return Flows
PblR_R1	Pueblo non-sewered return flows - Reach 1
PblR_S	Pueblo sewered return flows
Pb_RF	Pueblo County AVC Group return flows
RetFlow1	Agricultural return flows - Reach 1
RetFlow2	Agricultural return flows - Reach 2
RetFlow3	Agricultural return flows - Reach 3
RetFlow4	Agricultural return flows - Reach 4
Fow_RF	Otero County - Fowler Regionalization Unit AVC Group return flows
RetFlow5	Agricultural return flows - Reach 5
RetFlow6	Agricultural return flows - Reach 6
Crow_RF	Crowley County AVC Group return flows
RF_RF	Otero County – Rocky Ford Regionalization Unit AVC Group return flows
RetFlow7	Agricultural return flows - Reach 7
LF_RF	Otero County – La Junta Regionalization Unit AVC Group return flows
RetFlow8	Agricultural return flows - Reach 8
Ote_RF	Otero County AVC Group return flows
RetFlow9	Agricultural return flows - Reach 9
Bent_RF	Bent County AVC Group return flows
RetFlowLM	Agricultural return flows - Reach 19 (Lake Meredith)

Table 28. Fountain Creek Return Flow Nodes

Node Name	Node Description
NWRF_L	J.D. Phillips Water Reclamation Facility inflows.
RF_NSEW1	Colorado Springs non-sewered return flows – Reach 1
LVSWWTF_L	Las Vegas Street Wastewater Treatment Facility inflows
RF_NSEW2	Colorado Springs non-sewered return flows - Reach 2
RF_NSEW3	Colorado Springs non-sewered return flows - Reach 3
RF_Fountain Valley AuthorityStratN	Non-Sewered Fountain Valley Authority return flows (Stratmoor Hills)
RF_Fountain Valley AuthoritySec	Security sewered and non-sewered return flows
RF_Fountain Valley AuthorityWide	Widefield Fountain Valley Authority sewered and non-sewered return flows
RF_Fountain Valley AuthorityFtn	Fountain sewered and non-sewered return flows
LFWRF_L	Clear Spring Regional Water Reclamation Facility inflows

Custom Model Constructs

Although MODSIM contains a significant amount of built-in capability to simulate most of the water administration on the Arkansas River, there are a few operations that require more robust logic outside of the software's built-in capabilities. In order to simulate these operations, a combination of "disconnected networks" and customization of MODSIM runtime coding using the PERL scripting language was used. Details on the original PERL code can be found in the Southern Delivery System Model Documentation Report.

For the AVC EIS, improvements to the command line executable were implemented. These include the following changes:

- The PERL code was modified so that the minimum exchange values are used following time-step 24. Previously, minimum exchange values were only used following time-step 50. Modified PERL code so that the minimum exchange calculation is made only after the storage step. Previously, this calculation was made after both the direct flow and storage step, which caused oscillations.

- In conjunction with the previously described change, the code was modified in how the adjustments for the Pueblo Flow Management Program are made in the exchange calculation code (see variable $fmp_exallwmin). Previously, the minimum values were calculated, just as any other exchange reach. However, the code was modified so that this value continued to be calculated dynamically (up to iteration 60). This change resulted in substantial improvements to the exchange potential calculations – the number of days where exchanges did not converge and the average difference decreased substantially. The number of days that the Pueblo Flow Management Program did not converge also decreased slightly.

- The code was modified to include separate sub-routines for calculation of minimum and maximum values. This was originally intended to decrease run-time. The change actually resulted in slight increases in run-time. However, the change resulted in easier to read and shorter code that allows for easier modification to simulate AVC and the Master Contract.

- The code was modified to include a separate sub-routine to assign reservoir target and storage values to the MODSIM links ("stor" sub-routine). This change primarily resulted in easier to read code, and a slight reduction in run-time.

- The code was modified to include accounting of new Master Contract excess capacity accounts in Pueblo Reservoir.

- The code was modified to include accounting of AVC and Master Contract participant Fry-Ark carry-over storage.

- The code was modified to include additional exchange points along the Arkansas River downstream from Pueblo Reservoir.

- The code was modified to include calculation of reusable return flow for Widefield and Stratmoor Hills.

- The code was modified to include accounting of Super Ditch intermediate exchange reservoirs.

- General code “cleanup” occurred, including removal of comment lines, consolidation of some lines of code, and removing un-needed code.

The Daily Model uses PERL Scripting to manipulate the MODSIM solver only during the “IterateTop” sub-routine, which is at the top of each iteration during each time-step in the model. Data are read into the script during the “Initialize” sub-routine. The remaining sub-routines are not used and their space in the script is simply left blank. An outline of the Daily Model PERL script is presented in Table 29. Each section of the PERL Script is described in more detail in the following sub-sections.

Table 29. Outline of Daily Model PERL Script

Sub-Routine	Lines	Description	Notes
Initialize	4 – 389	Read Link Node Data	
IterateTop	390 – 403	General Info	
	404 – 538	Set Reservoir Account Info (1)	Iteration 0
	539 – 642	Calculate Reusable Return Flow Ratios for Board of Water Works of Pueblo, Fountain, Security, Widefield, and Stratmoor Hills (1)	Iteration 0
	643 – 1014	Calculate Excess Capacity Target and Spills (1)	Iteration 0
	1015 – 1023	Set Amount of Homestake Water From Colorado Springs to Aurora	Iteration 0
	1024 – 1036	Set Colorado Canal Storage Accounts	
	1037 – 1073	Initialize minimum exchange values; Miscellaneous Print Statements	
	1074 – 1084	Set Fry-Ark Account Evaporation Links	
	1085 – 1124	Calculate reduction in Fry-Ark Project deliveries due to dry-up (1)	
	1125 – 1177	Set Exchange Links (1)	
	1178 – 1209	Flow Management Program Calculations	
	1210 – 1411	Additional Exchange Link settings (1)	
	1412 – 1425	Miscellaneous Print Statements	Currently Commented Out (Not used)
	1426 – 1432	Set Colorado Canal Account Info	
	1433 – 1444	Mount Elbert Calculations/ Temporary exchanges between Aurora and Fry-Ark	
	1445 – 1454	Colorado Springs Reusable Return Flow Ratios	
	1455 – 1467	Set Aurora Rocky Ford Demands	
IterateBottom	1478 – 1483	N/A	
Iterate Converged	1484 – 1488	N/A	
Output	1489 – 1493	N/A	

Notes:
(1) New or modified code for the purposes of the Daily Model.

Many of the custom constructs use only disconnected networks to perform calculations. However, there are several instances where disconnected networks and PERL scripting are used in tandem to perform more complicated calculations. Specific uses of custom constructs using disconnected networks and/or PERL scripting are described in Southern Delivery System Model Documentation Report. No substantial changes from the general construct description were made as part of the AVC modeling.

Model Use

As previously stated, the Daily Model consists of Microsoft Excel pre-processor and post-processor files and the MODSIM engine. All of these files must be used to properly execute a run using the Daily Model. The general user steps are shown in Figure 8. Further discussion regarding the Daily Model components is contained in the following sub-sections.

MODSIM_In.xls Pre-Processor

1. Select appropriate radio buttons on input worksheet;
2. Enter appropriate data where required;
3. Run "Write ADA" macro using the button;
4. Select the appropriate support files to write. The recommended support files to write will automatically be checked.

↓

MODSIM GUI File

1. Import ADA files;
2. Make changes to the interface where required (this step typically does not need to be performed.
3. Save file;

↓

MODSIM Command Line Version

1. Run the "DC.bat" file

↓

MODSIM_Out.xls Post-Processor (or other output files)

1. On the "Columnar" worksheet, enter the appropriate node name(s) to retrieve.
2. Run the "Get Data" macro to select the appriate MODSIM model run and retrieve the data.
3. Perform any necessary post-procession calculations.

Figure 8. Flowchart for Daily Model Execution

Microsoft Excel Pre-Processor

The pre-processor file by default is named MODSIM_In.xls, although the user can change this name if necessary. The primary function of this file is to house the Daily Model settings and some basic input data. Data files contained in the "Support_Files" directory house the actual Daily Model data and make changes to the input data sets based upon the settings defined in the pre-processor file. The Southern Delivery System Model Documentation Report contains additional detail about the pre-processor. A summary of the support files used in the Daily Model is shown in Table 30.

Table 30. Base Model Support Files

File	Description
Inflow Files	
inflows_upbas.xlsm	Tributary Inflows - Upper Arkansas River Basin
imports_others.xlsm	Transmountain Imports - IPTDS, Homestake, Busk-Ivanhoe
inflows_fountck.xlsm	Tributary Inflows - Fountain Creek Basin
imports_boustead.xlsm	Transmountain Imports - Boustead
Demand Files	
demands_csu.xlsm	Demands - Colorado Springs
demands_pbww.xlsm	Demands - Board of Water Works of Pueblo
demands_pblwest.xlsm	Demands - Pueblo West
demands_fryark.xlsm	Demands - Other Fry-Ark Entities
demands_otero.xlsm	Demands - Otero Pump Station
demands_cc.xlsm	Demands - Colorado Canal
ops_otero.xlsm	Operations - Otero Pump Station
demands_ftn.xlsm	Demands - Fountain
demands_sec.xlsm	Demands - Security
demands_ccww.xlsm	Demands - Cañon City
avc_demands.xlsm	Demands – AVC Participants; miscellaneous supply information
MC_demands.xlsm	Demand – Remaining Master Contract Participants; miscellaneous supply information
Reservoir Files	
res_FryArk.xlsm	Reservoir Data - Fry Ark Reservoirs
res_other.xlsm	Reservoir Data - Clear Creek, Homestake
res_evap.xlsm	Reservoir Data - Evaporation Data
res_sds.xlsm	Reservoir Data - Southern Delivery System Reservoirs
res_MerOut.xlsm	Reservoir Data - Lake Meredith Releases and Leases
res_colocanal.xlsm	Reservoir Data - Colorado Canal System
res_roy.xlsm	Reservoir Data - Restoration-of-Yield Storage
Exchange Files	
aurora_exch.xlsm	Exchange Data - Aurora Operations
exch_hist.xlsm	Exchange Data - Historical Exchanges
Miscellaneous Files	
Demands_LasAnimas.xlsm	Operations- Arkansas River at Las Animas gage demand node
CSU_RtnFlow.xlsm	Return Flow Data – Colorado Springs reusable return flow calculations, including: native production, local exchange and augmentation, and well depletions
fish_hatch.xlsm	Operations - Pueblo Fish Hatchery
flow_mngt.xlsm	Operations - Flow Management Program and Instream Flow Data
sds_alts.xlsm	Operations - Southern Delivery System Alternatives
winter_water.xlsm	Operations - Winter Water Storage Program
rfag_start.xlsm	Return Flows - Agricultural Return Flows for Warm-up Period
avc_alts.xlsm	AVC Non-Project supply information
super_ditch.xlsm	Super Ditch supply information

MODSIM

The Daily Model uses the MODSIM software to perform the actual model calculations. For purposes of the Daily Model, there are two different components of MODSIM that are used for the analysis:

- MODSIM graphical user interface – The MODSIM graphical user interface is used to edit the MODSIM schematic and make changes to non-time-series data in the model nodes. Although the graphical user interface will allow the user to run the Daily Model, it will give incorrect results because the Daily Model uses custom code that must be run using the command line version (see next item).

- MODSIM Command Line Executable – Because the Daily Model uses custom coding, the Daily Model must be run using the MS-DOS command-line version of MODSIM.

As stated and shown in Figure 8, a batch file has been developed to allow the user to simply run the batch file from the MS-DOS command line. This batch file contains the necessary coding to run the Daily Model with the custom code and with the time-series files contained in the "ADA" directory. It should be noted that if the MODSIM file name is changed then the batch file must also be modified accordingly.

Microsoft Excel Post-Processor
The Microsoft Excel® post-processing files contain macros that load specified results from the MODSIM output files for further analysis and/or display. MODSIM writes comma delimited ASCII text files for link flow, link accrual, demand data, reservoir data, and groundwater data. Available information for each of those output file types supported by the post-processor file (reservoirs, links, and demands). Groundwater and accrual files typically are not used for output data, thus are not supported by the post-processor file. However, they are occasionally consulted for Daily Model verification and calibration and there is a separate post-processor file available that can load data in these files for one node at a time.

Base Model Verification and Calibration

For purposes of the Daily Model, the terms "verification" and "calibration" have two distinct definitions and consist of parallel but distinct processes. The definitions are as follows:

Verification – Verifying that the Daily Model is working correctly. That is, that the Daily Model construction accurately represents operations in the physical world.

Calibration – Verifying that the input parameters and assumptions used in the Daily Model accurately represent the physical processes.

The verification process primarily involves checking the Daily Model calculations. For the Daily Model construction, spreadsheets were developed that check the entire calculation method for a single time-step. The calibration process primarily involves comparing results from the Daily Model for a historical run with actual historical data. The primary points of comparison were selected streamflow gages, historical reservoir contents, and demands. Data for each of these nodes were compared with historical data for a selected time period. The selected time period does not coincide with the study period, but was a collection of more recent years during which river operations were close to those in the Daily Model.

This section documents the Daily Model verification and calibration process, and the results of the process at selected locations. Full verification and calibration results are presented on the AVC EIS website at http://www.usbr.gov/avceis.

Verification and Calibration Process

Although the Daily Model was calibrated for the Southern Delivery System EIS, the extension of the time period through 2009 and changes made to model infrastructure prompted a second verification and calibration of the model for the AVC EIS. Verification and calibration of the Daily Model was an iterative process that required multiple model runs for historical conditions, as well as model runs for existing conditions. The process began with the selection of a verification and calibration "period-of-comparison," the selection of key indicator locations, the selection of key indicator statistics to be measured at these locations and the development of tools that perform the tasks required. Each of these components is described below.

Period of Comparison

Ideally, the calibration period should be as long a period as possible. However, in the Arkansas River Basin, operations have changed substantially over the years. Some of those operational changes were previously described. Therefore, for purposes of verification and calibration, a shorter time period was selected. However, verification and calibration also involved a historical conditions run over the entire study period to make sure that the Daily Model is generally performing as expected over the study period.

The Daily Model was calibrated using historical data and operations from 1996 through 2009, a 14 year period. Prior to this period, there were several differences in water use and operations that are difficult to simulate given the "hard-wired" operational code in the model. A five year warm-up period (1991-1996) was also utilized for the calibration to allow return flow lags to establish in the model for consistent representation of return flows to the river.

Two events were critical in selection of the calibration period: the full use of Colorado Canal exchanges by Colorado Springs and the City of Aurora, and the full use of Rocky Ford I and initial and full use of Rocky Ford II exchanges by Aurora. Another key event, the establishment and operations regarding the *Amended Rules And Regulations Governing The Diversion And Use Of Tributary Groundwater In The Arkansas River Basin, Colorado* or 1996 Use Rules, was also a factor in selecting this calibration period. The calibration period is a mix of wet, average, and dry years in which the river operations are generally consistent with existing operations. This study period also saw the complete filling and emptying of Fry-Ark and other reservoir facilities, thereby verifying that reservoir operations are working correctly on both ends of the hydrologic scale. Adjustments to parameters included return flow calculations, gain-loss calculations, rules used to move water between reservoirs, or other overall assumptions in the Daily Model.

Key Indicator Locations

Key indicator locations included a collection of streamflow gages and reservoirs. Key indicator locations were chosen to be representative of various reaches on the river and various operations. Because operations are often fairly consistent within reaches, not all locations were investigated in detail during the calibration process. The process focused on the key indicator locations shown in Table 31.

Table 31. Verification and Calibration Process Key Indicator Locations

Variable	Description
Streamflow Gages	Lake Fork Creek below Sugar Loaf Dam (07082500)
	Lake Creek below Twin Lakes (LAKBTLCO)
	Arkansas River near Wellsville (07093700)
	Arkansas River at Portland (07097000)
	Arkansas River above Pueblo (07099400)
	Arkansas River near Avondale (07109500)
	Arkansas River at La Junta (07123000)
	Arkansas River at Las Animas (07124000)
	Fountain Creek at Security (07105800)
	Fountain Creek at Pueblo (07106500)
	Monument Creek at Pikeview (07104000)
	Jimmy Camp Creek at Fountain (07105900)
Reservoirs	Turquoise Lake
	Twin Lakes
	Pueblo Reservoir

Verification and calibration data are available for all of the links and nodes contained in the Daily Model and were used when necessary to perform verification and calibration.

Key Performance Measures

Key performance measures were selected based on their ability to characterize the relationship between historical data and simulated data. The inability of the model to meet one of these key performance measures does not constitute a “failure” of the model for that parameter or location. Rather, each of the statistical values provides one picture of the overall calibration test. The following key performance measures were used for the Daily Model calibration. The following sub-sections describe each of the statistical measures used to calibrate the Daily Model in the verification and calibration process.

It should be noted that none of the statistical methods described below remove outliers from the data set. Although this is common procedure in many modeling applications, the EIS Team deemed it inappropriate for measurement of calibration parameters because the effects analyses performed with the Daily Model ultimately include all data points. Exclusion of certain outlier data points could skew overall averages. Because outliers are not excluded, some of the statistical methods below (in particular the extreme value methods such as maximums or minimums) may exceed target values for time periods that include outliers.

Average Monthly Values

The analysis of average monthly values is not as much of a statistical test as simply a measure to compare the overall differences between the data sets. Table 32 presents a sample table that shows the average monthly historical and simulated streamflows in the calibration study period. From the average streamflow values, the Difference (simulated – historical) and percent difference (Difference / historical) are also calculated (these values are also commonly referred to as bias and percent bias). This table gives an overall snapshot of the differences and the general time of year in which they occur.

In addition to the average monthly values over the calibration period, average monthly streamflow for each month in the calibration period was calculated. Then, the maximum deviation between the two data sets was determined. The last column in the table presents the absolute maximum percent difference (Difference / historical monthly average during the month in which the maximum occurred) in average monthly streamflow that occurred during the calibration period. This value gives a snapshot of the differences in simulated values once the variation over daily values is removed.

Table 32. Sample Average Monthly Value Table for Model Verification and Calibration

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference (cfs)	Percent Difference (percent)	Max. Monthly Difference (percent) (1)
October	536	557	22	4.0	-6.0 (1998)
November	555	574	19	3.3	3.3 (2001)
December	417	416	-1	-0.1	3.5 (2000)
January	396	396	0	0.1	3.0 (2001)
February	410	388	-22	-5.4	4.7 (1999)
March	659	623	-36	-5.5	9.5 (2002)
April	1,022	981	-40	-3.9	26 (2002)
May	1,694	1,636	-58	-3.4	11 (2002)
June	2,298	2,334	37	1.6	7.2 (2002)
July	1,392	1,413	21	1.5	10 (2002)
August	1,248	1,249	1	0.1	24 (2002)
September	562	583	21	3.7	18 (2002)
Average	934	931	-3	-0.3	26 (2002)

Notes:
(1) Percent difference for maximum monthly streamflow is the maximum for each month of the following: simulated monthly streamflow – observed monthly streamflow / observed monthly streamflow.

Time-Series Plots of Historical and Simulated Data

The time-series plot simply graphs the historical and simulated data sets with no statistical summary or adjustment other than conversion of data from one unit to another when necessary. As with the average monthly table, the time-series plot is not necessarily a statistical analysis, but gives a visual snapshot of the overall differences between the data sets. Figure 9 presents a sample time-series plot of a historical and simulated data set. As can be seen from the figure, the two data sets in this example generally compare well, except for a few isolated high flow cases.

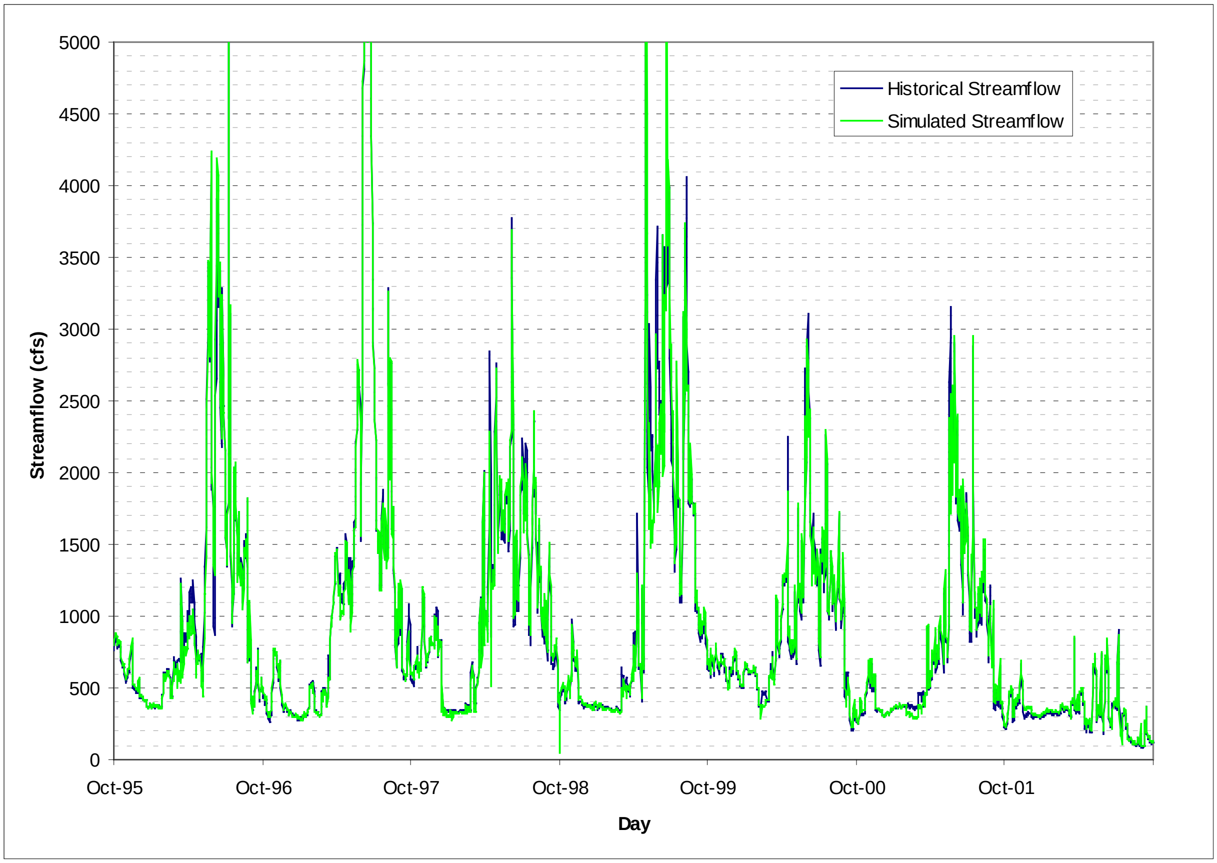

Figure 9. Sample Time-Series Plot for Model Verification and Calibration

General Statistical Summary

A general statistical summary of the two data sets is prepared as part of the overall verification and calibration process. Although general statistical data sets do not assist in the actual verification and calibration, they do provide information that indicates the overall similarities between the data sets. The general statistics are both parametric and non-parametric in nature. A sample of these statistics is shown in Table 33.

Table 33. Sample General Statistical Summary of Data Sets for Model Verification and Calibration

Statistical Measure (parametric and non-parametric)	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Absolute Difference (cfs)	Percent Difference
Mean	934.3	931.2	-3.1	-0.3
Standard Deviation	904.3	917.0	12.7	1.4
Skew	3.54	3.96	0.4	11.8
Variance	817,741	840,849	23,109	2.8
95% Confidence Interval	35.1	35.5	0.5	1.4
Median	934.3	931.2	-3.1	-0.3
Minimum	87	44	-43.4	-49.9
25th Percentile	370	373	2.6	0.7
75th Percentile	1,170	1,177	7.2	0.6
Maximum	12,300	13,641	1341.4	10.9

Scatter Plots and Correlation to Equal Value

A simple scatter plot shows how well the simulated values for each day match the historical values for each day. If all values are exactly equal, then they will plot in a line on a chart with all x-values equal to all y-values. The distance that a particular data point is away from the "equal value line" gives a picture of the relative differences in individual historical and simulated data points. A sample of a scatter plot with an "equal value line" is shown in Figure 10.

A correlation analysis is used to describe the relationship between two variables. In the case of the verification and calibration process, these two variables are the historical streamflow and the simulated streamflow. Two measures can be used to quantify the strength of the linear relationship between the two data sets: the correlation coefficient (r) and the coefficient of determination (or squared correlation coefficient, r^2) values. The correlation coefficient is a value between –1 and 1, with scores of –1 and 1 equaling perfect linear correlation between two data sets and 0 indicating no relationship. For values greater than 0, the correlation is positive in nature, with increasing values of one variable correlating with increasing values of another variable. For values less than 0, the correlation is negative in nature, with increasing values in one variable correlating with decreasing values in another variable. The coefficient of determination is equal to the square of the correlation coefficient and thus has a value between 0 and 1. As the strength of the linear correlation between the data sets increases, so does the coefficient of determination. This value represents the total variance between the two data sets (whether positive or negative). In both cases, the closer these values are to 1.0, the better the correlation. Sample correlation statistics are shown in Table 34. Because these two statistics generally provide the same information, and because it is possible for two data sets to have a perfect correlation (r) without having matching numerical values as long as the slopes are the same, only the coefficient of determination (r^2) is used as a performance measure.

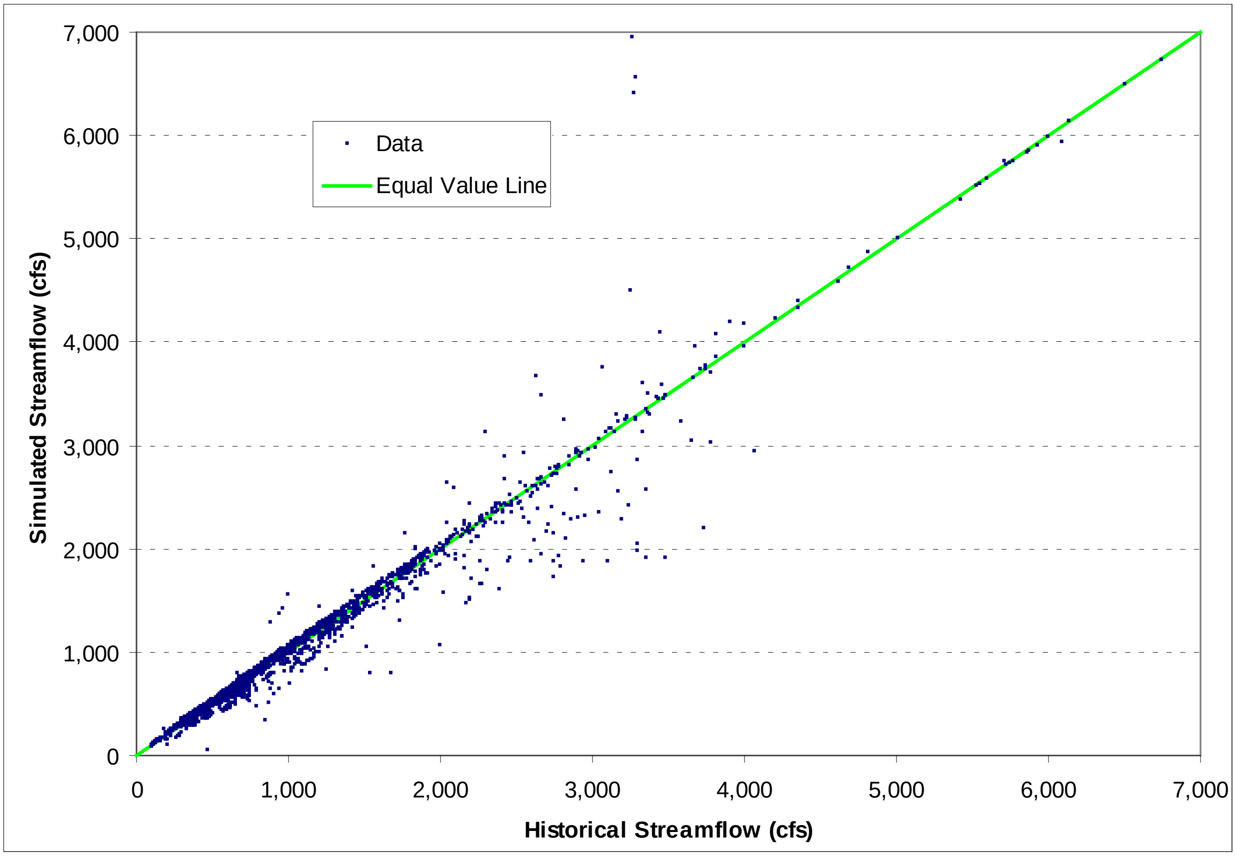

Figure 10. Sample Scatter Plot of Daily Values for Model Verification and Calibration

Table 34. Sample Correlation Statistics for Model Verification and Calibration

Measure [(1)]	Value
Correlation Coefficient (r)	0.980
Coefficient of Determination (r^2)	0.960

Note:

[(1)] Only the coefficient of determination is used as a performance measure.

Cumulative Distribution Function

The cumulative distribution function and the corresponding Kolmogorov-Smirnov test give an indication as to whether two sets of data have the same distribution. The cumulative distribution of the two data sets is plotted by developing a histogram of flows within certain ranges. A sample of cumulative distribution functions are shown in Figure 11. From the cumulative distribution function, the observed maximum difference of the two distributions (D_n) is compared with the critical value at a predetermined significance level (D_n^α). If the observed value is less than the critical value, then the simulated distribution can be considered statistically the same distribution as the historical distribution at the significant level (α). The Kolmogorov-Smirnov test was selected rather than the more common chi-square test because the Kolmogorov-Smirnov test does not require that the data fit an assumed distribution.

Critical values for the Kolmogorov-Smirnov test are dependent upon the overall sample size. Because the sample size of the calibration period is greater than 50, equations that are inversely proportional to the square root of the sample size are used. A summary of these equations and the resulting critical values for the calibration period are presented in Table 35.

Table 35. Critical Values in the Kolmogorov-Smirnov Test

Significance Level (α)	Equation	Critical Value [1]
0.01	$1.63/\sqrt{n}$	0.023
0.05	$1.36/\sqrt{n}$	0.019
0.10	$1.22/\sqrt{n}$	0.017
0.20	$1.07/\sqrt{n}$	0.015

Note:
[1] Assumes n (number of data points) = 5,114

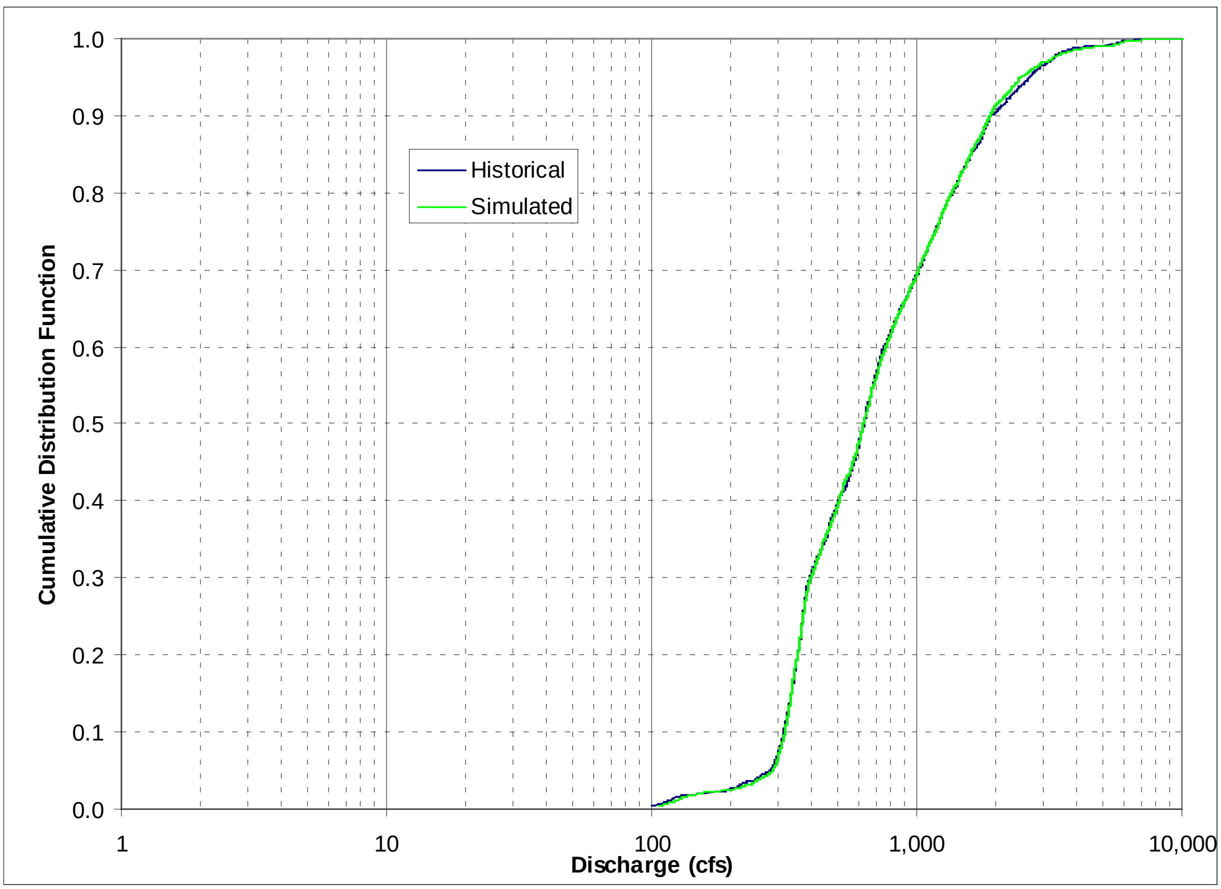

Figure 11. Sample Cumulative Distribution Function for Model Verification and Calibration

Other Mathematical Tools for Verification and Calibration

Several other mathematical tools and plots were used in the verification and calibration process, although they were not specifically used as target measures. The primary tool used was an analysis of residuals, where residual is the difference between the historical value and the simulated value. Time-series plots of the absolute residuals as well as the percent residual were used to determine those specific time steps where significant differences in the data sets occurred. In addition, residual probability graphs were developed that show the cumulative distribution of the residuals. Because these graphs primarily help detect where significant differences occur, but do not necessarily provide any meaningful statistical significance to the analysis of the data sets, they were not used as performance measures between the data sets.

Verification and Calibration Tools

As previously discussed, several spreadsheet tools were developed to assist in the verification and calibration process. These tools can generally be classified as follows:

- Time-Series Comparison of a Single Data Set
- Single Time-Step Calculation Verification

The time-series comparison tools work similar to the overall output files for the Daily Model. For the calibration period, a single set of data, such as streamflow at a single gage, is directly compared to the historical data set. For data sets such as streamflow and reservoir contents, the statistical analyses described in the previous section are performed to judge performance of the Daily Model. For other data sets such as historical demand, simulated and historical data sets can be compared to ensure the Daily Model is fully meeting demands. These types of time-series comparison tools were developed for streamflow, reservoir contents, demands, and systems operations for both the verification and calibration process.

The single time-step calculation verification was developed to mimic MODSIM's actual operations during a single time step to verify whether the Daily Model construction is correctly simulating historical operations. This spreadsheet includes all primary river system links and nodes, and tracks all inflow, outflows, reservoir releases, and streamflows through the system.

Process for Performing Verification and Calibration

The process for performing the verification and calibration involved multiple model runs and model adjustments. Table 36 presents a summary of the key indicators, key performance measures and the target significance tests used in the verification and calibration process. The process of modifying the model data or construction and performing the tests was continued until all significance tests were rejected (i.e., none of the significance tests were true) or all differences could be adequately explained. For most of the indicators and performance measures, the target values were met. However, for a small number of indicators and/or performance measures, the model was unable to meet the target values. This was deemed to be acceptable if the reasons could be clearly explained and the differences were not critical for estimating impacts of the alternatives. These occurrences and the explanations are contained in the following sections.

Table 36. Summary of Key Indicator Statistics and Target Values

Key Indicator	Key Performance Measure[1]	Time-Step	Significance Test (Null Hypothesis: Data Sets Are Statistically Different)
Streamflow	Difference	Monthly	Difference in any single month greater than 25%
	Difference	Average Monthly	Difference in average for the month greater than 10%
	Difference	Average Annual	Difference in average for the year greater than 10,000 acre-feet difference
	Difference	Average Annual	Difference in average for the year greater than 2%
	Scatter Plot & Correlation	Daily	Coefficient of Determination (r^2) less than 0.95
	Cumulative Distribution	Daily	Kolmogorov-Smirnoff Test Value (D) greater than the 5% significance level
Storage	Difference	Average Monthly	Difference in average for the month greater than 10%
	Difference	Average Annual	Difference in average for the year greater than 10% of the total active reservoir contents
	Difference	Daily	Any single day with a difference greater than 25% of the total active reservoir contents
	Difference	Daily	Difference in any single day greater than 25%

Notes:
[1] Key performance measures expressed as differences, in percent, are calculated as percent error

Model Modifications Through Verification and Calibration Processes

Several modifications were made to the original model construction through both the verification and calibration process. Although both of these processes were undertaken simultaneously, the changes can be divided into those made under each process. The Southern Delivery System Model Documentation Report discusses model issues and modifications during the initial (for the Southern Delivery System EIS) verification and calibration process. Issues that arose during the initial calibration were checked during the calibration of the Daily Model to ensure operations were working properly for the modified model. These occurrences included verifying the simulation of exchanges, evaporation, agricultural return flow values, winter releases from Turquoise Lake and gain/loss adjustments to account for historical releases of Fry-Ark project water from Turquoise Lake.

A few minor modifications to the Daily Model MODSIM interface were made to calibrate to the extended time period, and from additional information as follows.

- A model construct was added to evacuate more water out of Turquoise Lake and Twin Lakes Fry-Ark project accounts in anticipation of large Boustead Tunnel inflow forecasts, such as occurred in 2008.

- Previous model logic prevented Homestake Reservoir from refilling when contents were very low, as occurred in the mid-2000s, by sending everything to Turquoise Lake and Twin Lakes. Small changes were made to links and nodes of the Homestake Tunnel to fix this issue.

- The calculation methods for simulating ungaged inflows to Upper Basin reservoirs was modified to include actual data prior to 1995, and regressed data from 1995 to present. Previously, regressed data was used for all inflows. However, further calibration runs showed that actual data performed better prior to 1995 due to estimation methods required for some data sets prior to 1995.

- Recent U.S. Supreme Court documents (i.e. H-I Model documentation; Littleworth 2008) published reach allocation tables of surface water and groundwater return flows that provided better resolution than previously used. These tables were incorporated into the model to better characterize historical agricultural return flow patterns.

Evaluation of Key Indicators

The key indicators for streamflow and reservoirs were evaluated at each of the key indicator locations previously shown in Table 37. A summary of the indicator thresholds and calibration run values are shown in Table 37 for the streamflow locations and in Table 38 for the reservoir locations. The following sub-sections present calibration results for each of the key indicator locations and discuss performance measures in these tables, especially for those measures that did not meet the target values. The 14-year simulation (not including the warm-up period) included 168 months and 5,114 days. Full calibration results are presented on the AVC EIS website at http://www.usbr.gov/avceis.

Table 37. Summary of Streamflow Performance Measures

Station	Performance Measure / Target Value [1]				
	Maximum Monthly Difference (%)	Maximum Average Monthly Difference (%)	Average Annual Difference (%)	Correlation Coefficient (r^2)	Cumulative Distribution K-S Test (D)
	25%	10%	2.0%	0.950	0.027
Lake Fork Creek below Sugar Loaf Dam (07082500)	361 (2002)	70.6	-30.0	0.328	0.585
Lake Creek below Twin Lakes (LAKBTLCO)	463 (1998)	-46.8	0.8	0.757	0.072
Arkansas River near Wellsville (07093700)	-51 (2009)	-13.0	0.3	0.954	0.034
Arkansas River at Portland (07097000)	50 (2002)	-11.3	0.4	0.966	0.018
Arkansas River above Pueblo (07099400)	8,652 (2002)	4.9	0.6	0.983	0.039
Arkansas River near Avondale (07109500)	33 (2002)	-2.1	0.2	0.988	0.021
Arkansas River at La Junta (07123000)	290 (2002)	5.4	1.2	0.990	0.016
Arkansas River at Las Animas (07124000)	229 (2002)	8.0	2.1	0.994	0.024
Monument Creek at Pikeview (07104000)	24 (2004)	1.1	0.3	1.000	0.011
Fountain Creek at Security (07105800)	-11 (2009)	2.1	0.7	0.999	0.017
Jimmy Camp Creek at Fountain (07105900)	0.2 (2006)	0.0	0.0	1.000	0.043
Fountain Creek at Pueblo (07106500)	-37 (2008)	2.0	0.7	0.999	0.012

Notes:
[1] Shaded cells indicate that target value was exceeded.

Based on the maximum average annual difference shown in Table 37, Daily Model accuracy is generally represented in the EIS as 2%. This accuracy varies by location, timing and flow condition. During drier periods, accuracy is generally less, as basin operations and gains/losses are more difficult to simulate and have higher percent differences in streamflow.

Table 38. Summary of Reservoir Performance Measures

Station	Performance Measure / Target Value [(1)(2)]			
	Maximum Average Monthly Difference (%)	Average Annual Difference	Maximum Daily Difference	Maximum Daily Difference (%)
	10%	10% of Active Storage	25% of Active Storage	25%
Turquoise Lake	-6.6	-1,145	-30,381	48 (2003)
Twin Lakes	5.1	2,654	27,620	28 (2003)
Pueblo Reservoir	2.7	2,293	-32,058	-14 (2003)
Fry-Ark Project Reservoirs	2.5	3,801	28,572	7.1 (2004)

Notes:

(1) Target Values for Active Storage-Based Measures (ac-ft)

Reservoir	Active Storage	10%	25%
Turquoise Lake	120,478	12,048	30,120
Twin Lakes	67,917	6,792	16,979
Pueblo Reservoir	228,828	22,883	57,207
Fry-Ark Project Reservoirs	417,223	41,723	104,305

(2) Shaded cells indicate that target value was exceeded.

As previously mentioned, none of the performance measure results remove outliers from the data set. Target values may be exceeded for time periods that include outliers

Streamflow

For purposes of discussing the calibration results at streamflow locations, the results were lumped into four general categories: streamflow above Pueblo Reservoir, streamflow below Pueblo Reservoir, Monument Creek streamflow and Fountain Creek streamflow. Daily Model calibration in each of these reaches is discussed in the following sub-sections.

Arkansas River Above Pueblo Reservoir

Critical streamflow locations above Pueblo Reservoir include Lake Fork below Turquoise Lake, Lake Creek below Twin Lakes, the Arkansas River near Wellsville, and the Arkansas River at Portland.

Average monthly values at the Lake Fork Creek below Sugar Loaf Dam gage are shown in Table 39 and Figure 12. Flows at this gage are primarily influenced by releases from Turquoise Lake. Under normal operating conditions, Reclamation only makes releases from Turquoise Lake to Lake Fork to meet a target streamflow below the reservoir of approximately 4 cfs during winter, and up to Colorado Water Conservation Board instream flow amounts during summer. Occasionally, high inflows of native and transmountain supplies to Turquoise Lake that exceed the capacity of the Mt. Elbert Conduit and cannot be stored in Turquoise Lake because it is full necessitate releases to Lake Fork. Otherwise, Reclamation only makes releases to Lake Fork when native inflows exceed Mount Elbert Conduit capacity. The Daily Model produces releases from Turquoise Lake to meet the 4 cfs winter time releases and Colorado Water Conservation Board instream flows during the remainder of the year. Therefore, winter releases from the reservoir match nearly exactly with historical releases. Releases in spring and early summer months are slightly lower than historical because the model strictly meets the 4 cfs flow requirements and only the 4 cfs flow requirements through the month of April, while historically, there are occasional variations in timing of the switch from the 4 cfs winter release to the 15 cfs minimum summer release. During September, there is slight variation in flows simply due to differences in transition from the 15 cfs summer release to the 4 cfs winter release.

Differences in peak flows during summer months are caused by differences in the way the Daily Model simulates releases from Turquoise Lake. In general, the Daily Model algorithms controlling releases from the reservoir through the Mount Elbert Conduit and Lake Fork are designed to maintain only the Colorado Water Conservation Board minimum flow rate. Occasionally, native flows that must be released downstream exceed conduit capacity and must flow down Lake Fork. However, historically, operations of the reservoir have occasionally released more than minimum required releases in Lake Fork due to circumstances outside model conditions, such as temporary shutdowns for maintenance of the pipeline, or other operational reasons. Therefore, overall, simulated releases are slightly lower than observed historical during non-winter months.

Due to complexities in operations at Turquoise Lake, the Daily Model cannot replicate historical conditions caused by non-reoccurring operational decisions that are based on the best judgment of the operators and are not part of decrees or explicit operational rules. In an attempt to simulate some operational decisions, a model construct was added to the MODSIM interface to evacuate more water out of Turquoise Lake in anticipation of large Boustead Tunnel inflow forecasts, such as occurred in 2008. However, differences still occur. Despite differences in simulated and observed historical conditions in Lake Fork during non-winter months, the Daily Model is adequate to compare AVC alternatives.

Table 39. Calibration Run Average Monthly Summary – Lake Fork Creek below Sugar Loaf Dam

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	4	4	0	-9.5	-70 (2006)
November	3	4	1	17.1	37 (2002)
December	3	4	1	18.1	38 (2002)
January	3	4	1	16.9	38 (2003)
February	3	4	1	17.0	53 (2003)
March	4	4	0	-2.6	-61 (1996)
April	7	4	-3	-38.3	-73 (1996)
May	21	16	-5	-24.0	95 (2000)
June	77	45	-32	-41.5	-85 (2006)
July	50	22	-28	-56.4	-91 (1998)
August	12	15	3	20.6	361 (2002)
September	7	11	5	70.6	332 (2002)
Average	16	11	-5	-30.0	361 (2002)

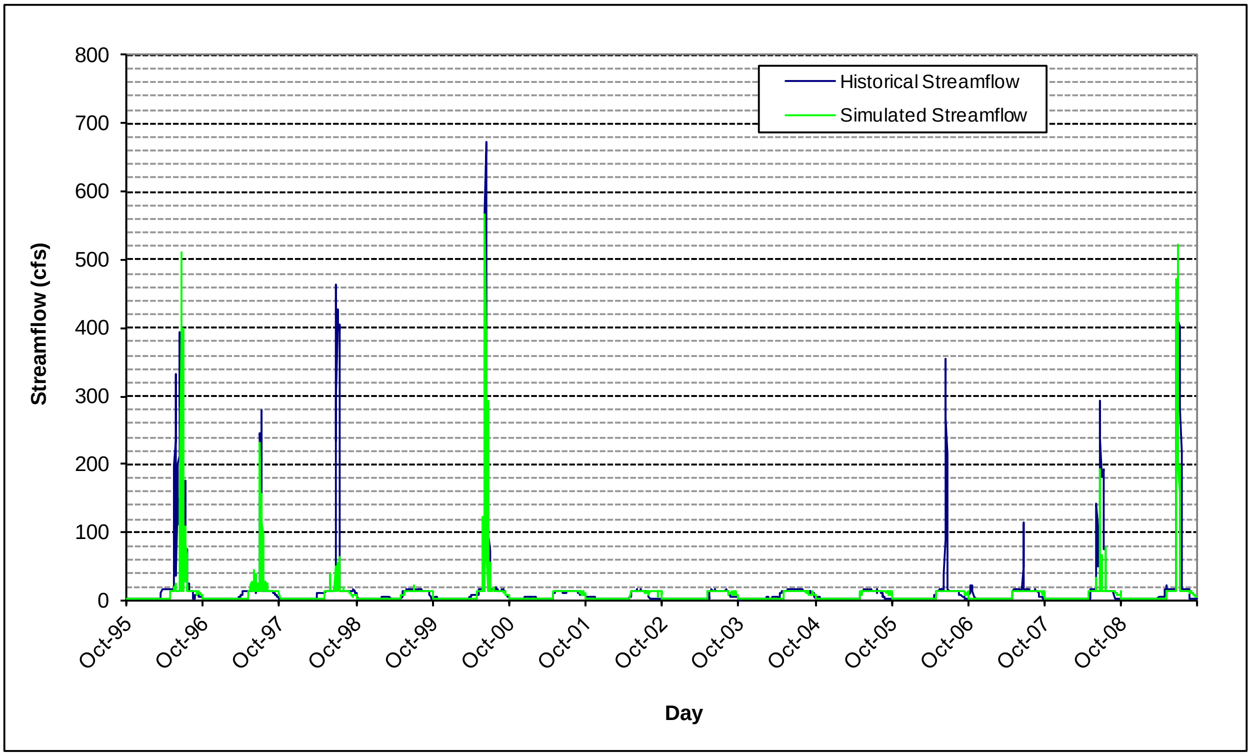

Figure 12. Calibration Run Time-Series Plot - Lake Fork Creek below Sugar Loaf Dam

Summaries of average monthly streamflows for the Lake Creek below Twin Lakes gage are shown in Table 40, while time-series data for the Lake Creek below Twin Lakes gage are shown in Figure 13. Flows at all gages above Pueblo Reservoir are significantly influenced by releases of Fry-Ark Project water made from Turquoise Lake through the Mount Elbert Conduit and Twin Lakes to meet target flows for the UAVFMP, and those made to vacate storage space in Turquoise Lake for the following year's imports. The Daily Model was constructed to simulate both of these types of releases in a strict manner. The model calibrates within 1 cfs, on average, at the Lake Creek below Twin Lakes gage, though larger differences are seen in specific months and days of the simulation. Many of these differences are due to conditions that are outside of the model assumptions, such as when Reclamation makes annual decisions that vary the magnitude and timing of releases. These unique annual decisions are not strictly based on conditional logic and can therefore not be simulated in the Daily Model. In particular, differences between simulated and actual historical operations during the springs of 2008 and 2009 are further discussed in the Twin Lakes storage section below.

Table 40. Calibration Run Average Monthly Summary – Lake Creek below Twin Lakes

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	34	33	0	-1.4	99 (1998)
November	47	64	17	36.3	463 (1998)
December	75	90	14	19.0	249 (2008)
January	106	131	24	22.8	173 (1996)
February	126	110	-16	-12.5	87 (2003)
March	125	67	-59	-46.8	162 (2003)
April	97	74	-23	-23.9	158 (1999)
May	369	372	3	0.7	117 (1999)
June	661	643	-18	-2.7	-35 (2009)
July	390	435	45	11.5	33 (1997)
August	186	213	27	14.3	245 (2008)
September	42	43	1	2.6	126 (2004)
Average	188	190	1	0.8	463 (1998)

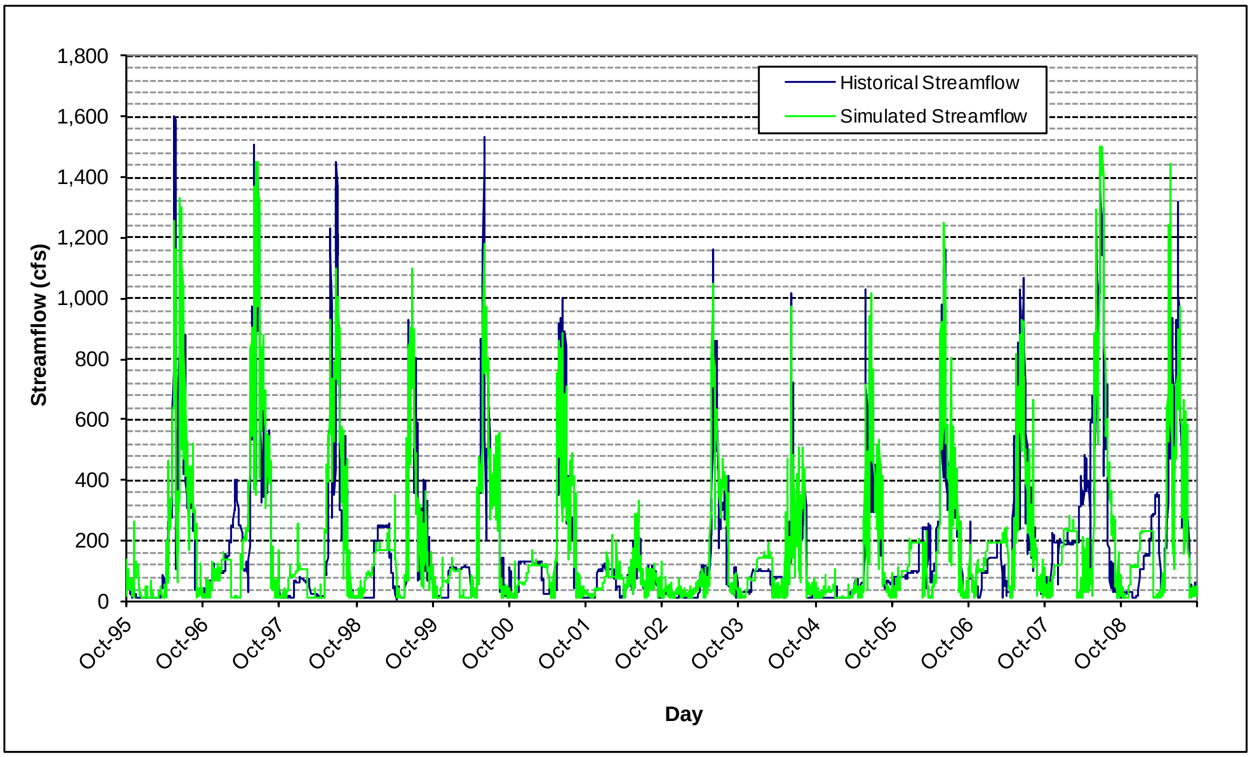

Figure 13. Calibration Run Time-Series Plot - Lake Creek Below Twin Lakes

Summaries of average monthly streamflows for the Arkansas River near Wellsville gage are shown in Table 41and Figure 14. Overall, simulated average annual streamflow is within 2 cfs, or 0.3 percent, of observed historical streamflow, and for average conditions, most calibration parameters are within gage target values. Maximum monthly differences between observed historical and simulated streamflow at the Arkansas River near Wellsville gage are mostly due to the same variations in operations that were explained for the Lake Fork Creek below Sugar Load Dam and Lake Creek below Twin Lakes gages. In addition to releases from Turquoise Lake and

Twin Lakes, flows at the Arkansas River near Wellsville gage are also influenced by releases from Clear Creek Reservoir, and differences between historical and simulated releases from Clear Creek do have some minor effects on differences in streamflow at the Arkansas River near Wellsville gage. Although maximum monthly differences exceed the target values of 25 percent during some months of the calibration period, given the complexities in simulating Upper Basin operations, the gage calibrates well.

Table 41. Calibration Run Average Monthly Summary – Arkansas River near Wellsville

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference (cfs)	Difference (percent)	Maximum Monthly Difference (percent, year)
October	377	377	0	0.0	5.9 (2001)
November	400	415	14	3.6	-17 (2007)
December	391	408	16	4.1	29 (2008)
January	393	420	27	7.0	25 (2006)
February	391	381	-10	-2.5	-32 (1997)
March	388	338	-50	-13.0	-51 (2009)
April	366	343	-23	-6.2	-37 (2008)
May	1,121	1,125	4	0.4	34 (1998)
June	1,947	1,959	12	0.6	19 (2002)
July	1,086	1,101	15	1.4	18 (2002)
August	660	666	5	0.8	26 (2008)
September	373	381	7	1.9	17 (2002)
Average	659	660	2	0.3	-51 (2009)

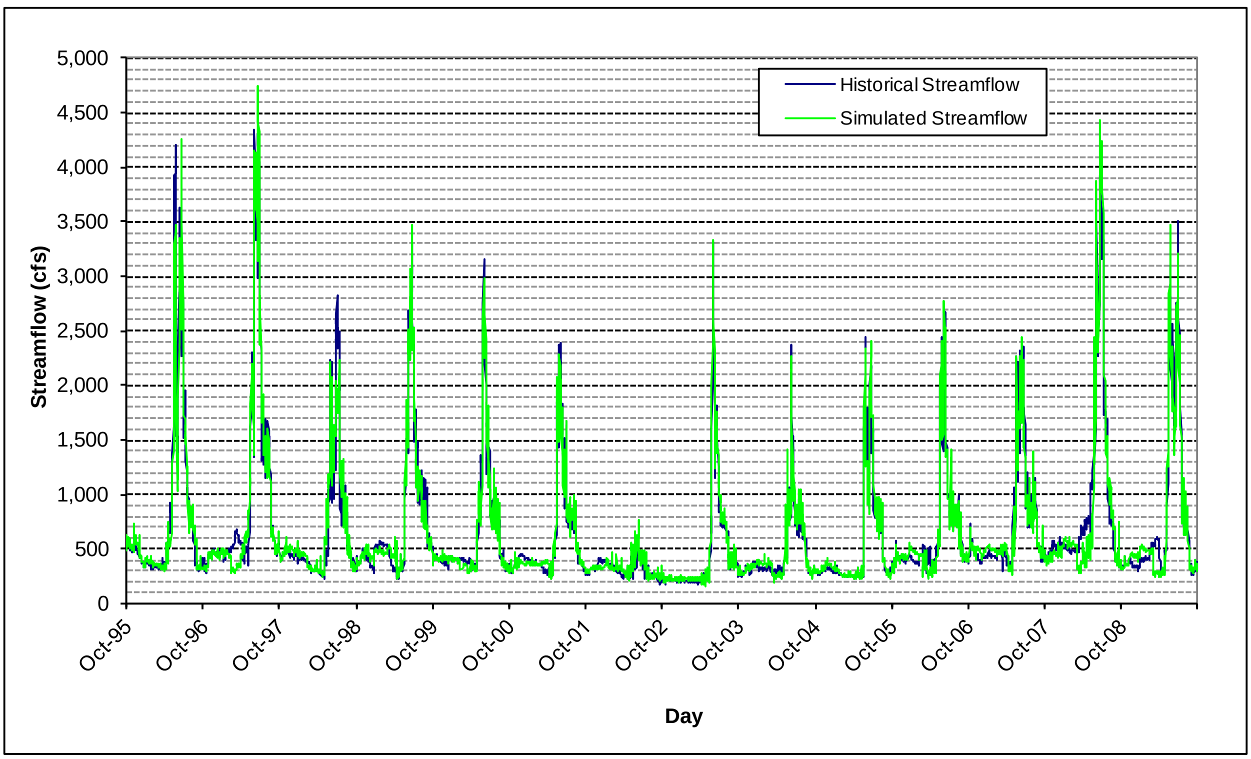

Figure 14. Calibration Run Time-Series Plot – Arkansas River near Wellsville

Simulation of basin operations to meet target flows at the Arkansas River near Wellsville gage that are part of the UAVFMP is an important factor in the Daily Model. Table 42 presents a summary of percent of time target flows for fish habitat and recreation are met during both observed historical and simulated historical conditions. In general, the Daily Model meets target flows slightly more often than during historical conditions. Most differences are during the drought year of 2002, when releases were not historically made during late summer months for recreational or fish habitat purposes.

As with the Lake Fork Creek below Sugar Loaf Dam gage, the Daily Model follows strict operational rules coded into the model and does not accommodate non-reoccurring exceptions to rules when reservoirs may be operated to meet other unspecified goals. However, the Daily Model is accurate enough to compare AVC EIS alternatives.

Table 42. Calibration Run - Summary of Upper Arkansas Voluntary Flow Management Program Targets

Calibration Run	Percent of Time Target Flows Met		
	Fish Habitat Flows (%)	Recreation Flows (%)	Overall (%)
Historical	93	82	91
Simulated	93	85	92

Summaries of average monthly streamflows for the Arkansas River at Portland gage are shown in Table 43, while time-series data for the Arkansas River at Portland gage are shown in Figure 15. As with the Lake Creek at Twin Lakes and Arkansas River near Wellsville gages, flows at the Arkansas River at Portland gage are influenced by storage and releases of native and transmountain water from Upper Basin Reservoirs (Twin Lakes and Turquoise Lake). Flows at the Arkansas River at Portland gage are also influenced by agricultural and municipal diversion made between this gage and the Arkansas River near Wellsville gage.

Calibration results show that for average calibration parameters, values are within target values for most parameters. Similar to the Arkansas River near Wellsville gage, for maximum monthly difference, there are several months in the calibration period where differences between historical and simulated conditions exceed the 25 percent target value. As with the Arkansas River near Wellsville and Lake Creek at Twin Lakes gages, these differences are due to complexities in simulating historical releases of Fry-Ark Project water, and are acceptable for the calibration period.

Table 43. Calibration Run Average Monthly Summary – Arkansas River at Portland

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	373	375	2	0.4	7.6 (2002)
November	426	440	14	3.3	-14 (2007)
December	405	420	15	3.7	25 (2008)
January	406	432	26	6.4	24 (2006)
February	408	398	-10	-2.5	-32 (1997)
March	430	381	-49	-11.3	-47 (2009)
April	399	377	-22	-5.4	-35 (2008)
May	1,212	1,216	4	0.3	28 (1998)
June	2,093	2,105	11	0.5	27 (2002)
July	1,139	1,162	22	2.0	50 (2002)
August	713	723	9	1.3	22 (2008)
September	344	354	10	3.0	32 (2002)
Average	697	699	3	0.4	50 (2002)

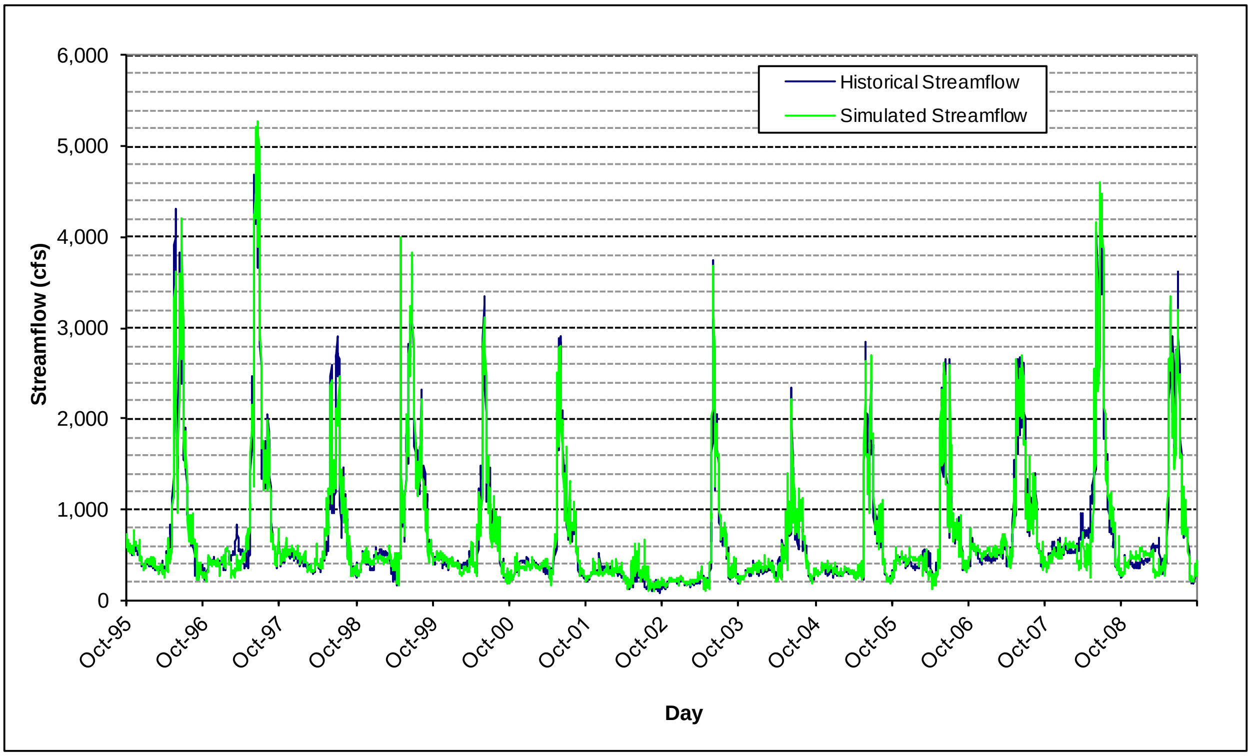

Figure 15. Calibration Run Time-Series Plot – Arkansas River at Portland

Arkansas River Below Pueblo Reservoir

Critical streamflow locations below Pueblo Reservoir include the Arkansas River above Pueblo gage, the Arkansas River near Avondale gage, the Arkansas River at La Junta gage, and the Arkansas River at Las Animas gage.

Average monthly historical and simulated streamflow at the Arkansas River above Pueblo gage are shown in Table 44, while a time-series plot of daily streamflow is shown in Figure 16. Overall, average simulated streamflow matches observed historical streamflow. The Daily

Model shows a mix of months and times when simulated flows are above or below observed historical. This is primarily due to small differences in agricultural return flow values in the lower basin during winter months.

Most of the other maximum monthly differences occurred during simulation of the system during times when reservoirs were full and water was forced to spill, or during dry periods in the 2000s when flows were extremely low. Simulated flows in the winter of 2002 can be quite different than the near zero historical values due to model rules that try to prevent a complete dry-up of the river at this point. Based on the Finding of No Significant Impact issued to the Board of Water Works of Pueblo for their South Outlet Works and Pipeline Conveyance Agreement (Reclamation 2000), the Board of Water Works of Pueblo is required to take diversions from its Northside Diversion (up to 17 cfs) when flows below Pueblo dam are less than 50 cfs (Reclamation 2000). This rule is simulated in the Daily Model. While this rule does not totally prevent reductions in streamflow below 50 cfs, it does cause significantly higher flows during very dry periods. Differences during high flow periods occur because the Daily Model strictly simulates the system during spill conditions that do not necessarily always match historical operations during spill conditions. Differences during low flow periods occur because small volumetric differences produce high percent errors due to the low historical volumetric streamflow.

Table 44. Calibration Run Average Monthly Summary – Arkansas River above Pueblo

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	254	251	-3	-1.2	60 (2002)
November	206	207	1	0.3	100 (2002)
December	114	116	2	1.7	8,652 (2002)
January	107	110	3	2.4	636 (2003)
February	118	123	6	4.9	271 (2003)
March	314	302	-12	-3.9	40 (2003)
April	512	516	4	0.7	30 (2006)
May	1,188	1,202	13	1.1	33 (1999)
June	1,902	1,915	13	0.7	12 (2002)
July	1,074	1,082	7	0.7	5.5 (2004)
August	712	726	14	1.9	111 (2002)
September	281	276	-5	-1.7	516 (2002)
Average	567	570	3	0.6	8,652 (2002)

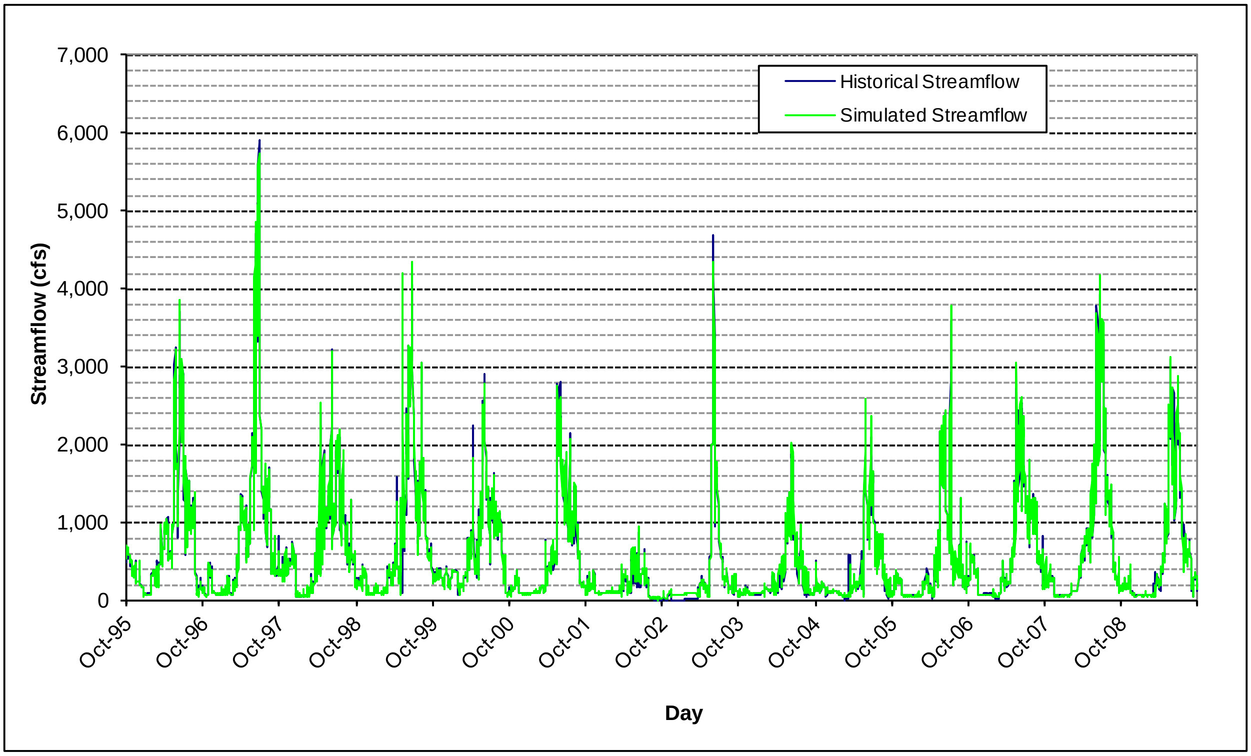

Figure 16. Calibration Run Time-Series Plot - Arkansas River above Pueblo

Average annual flow at the Arkansas River near Avondale gage is shown in Table 45, while time-series streamflow is shown in Figure 17. Overall, the Daily Model calibrates well with observed historical data, with average annual streamflow within 1 cfs, or 0.2 percent, of observed historical streamflow. There are some differences in the data, which are due to a combination of the same differences that occur at both the Arkansas River above Pueblo gage and the Fountain Creek at Pueblo gage. However, because differences between observed historical and simulated historical data at the Fountain Creek at Pueblo gage are minimal (see following section), most differences at the Arkansas River near Avondale gage are due to differences in the Arkansas River, as discussed at the Arkansas River above Pueblo gage.

Table 45. Calibration Run Average Monthly Summary – Arkansas River near Avondale

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference (cfs)	Difference (percent)	Maximum Monthly Difference (percent, year)
October	471	465	-6	-1.2	-6.2 (1997)
November	456	457	1	0.1	15 (2002)
December	340	344	4	1.2	33 (2002)
January	338	343	5	1.4	30 (2003)
February	354	361	7	2.0	24 (2003)
March	559	549	-10	-1.7	-15 (2009)
April	849	852	3	0.4	15 (2002)
May	1,604	1,613	9	0.6	11 (1999)
June	2,176	2,181	6	0.3	4.4 (2004)
July	1,321	1,323	2	0.1	3.7 (2004)
August	1,058	1,065	7	0.6	9.6 (2005)
September	503	493	-10	-2.1	-8.9 (1996)
Average	837	839	1	0.2	33 (2002)

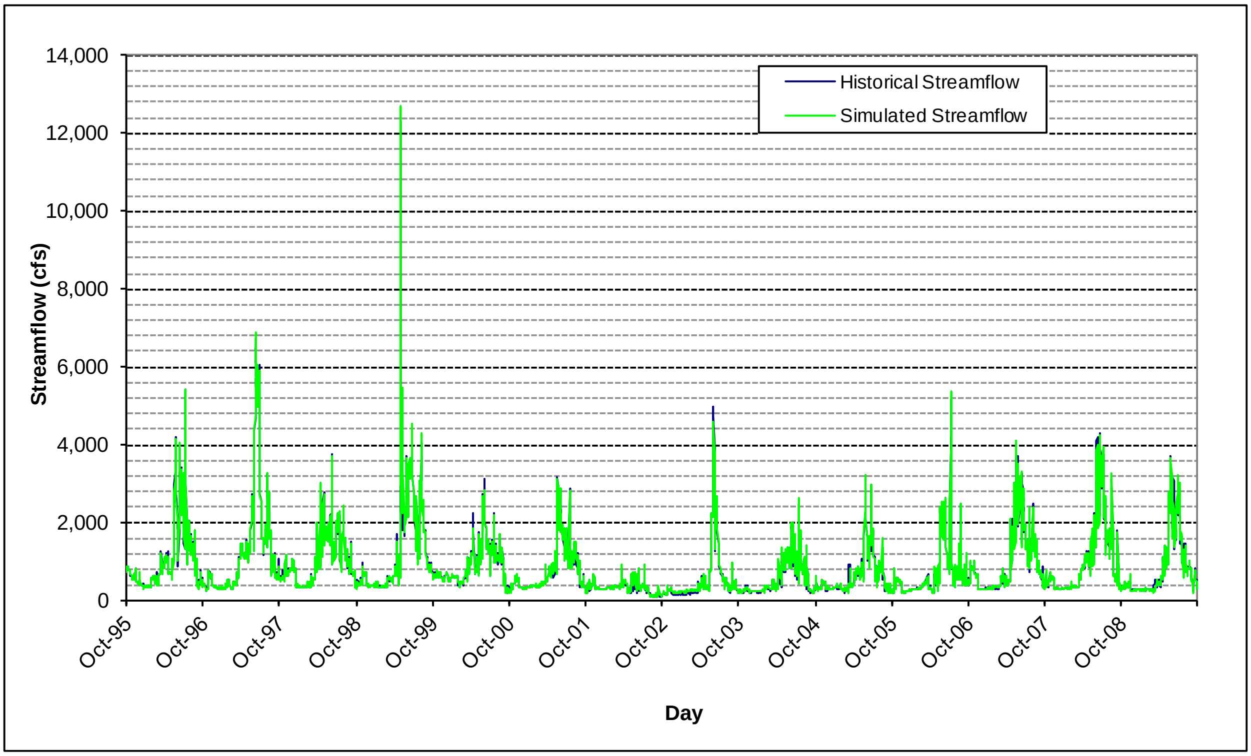

Figure 17. Calibration Run Time-Series Plot - Arkansas River near Avondale

Average monthly simulated streamflow for the Arkansas River at La Junta gage and Arkansas River at Las Animas gage are shown in Table 46 and Table 47. Simulated streamflow matches or nearly matches observed historical streamflow for the entire time series. The primary exception is times when reusable return flows or alternate points-of-diversion are “spilled.” An alternate point-of-diversion refers to water that is diverted at a location other than its original decreed location. Occasionally, this water cannot be diverted at its alternate point-of-diversion without injuring senior water rights and is “spilled” or allowed to flow downstream. Typically, these spills are sold or are used by the calling water right. However, because the Daily Model uses historical agricultural deliveries, there are times in the Daily Model when the historical sale or lease is not reflected in headgate diversions, and this water flows downstream.

Overall, average annual flow at the Arkansas River at La Junta gage is approximately 3 cfs (or 1.2 percent) higher than historical, while the Arkansas River at Las Animas gage is approximately 5 cfs (or 2.1 percent) higher than historical. Differences between the Arkansas River at La Junta and Arkansas River at Las Animas gages are due to adjustments made to agricultural return flow values. These adjustments affect flows at La Junta, while they do not affect flows at the Arkansas River at Las Animas gage because all adjustments are made upstream from the Arkansas River at Las Animas gage, while some adjustments are made downstream from the Arkansas River at La Junta gage.

The model is constructed to always meet historical flows at the Arkansas River at Las Animas gage. For the existing conditions and future conditions scenarios, the demands at the Arkansas River at Las Animas gage node are reduced during times when the historical call was junior to the John Martin Reservoir water right priority (12/14/1948) to the minimum of the Arkansas River below John Martin Reservoir gage flow or 1,250 cfs, whichever is less. By reducing demands during the junior call periods, the Daily Model allows the water rights priorities that are built into the Daily Model to distribute water to junior priorities. For the calibration model run, no adjustments were made, and the Arkansas River at Las Animas gage demands were set at the historical flow (MWH 2008a). Because of this, all variations from historical flow at the Arkansas River at Las Animas gage are positive. During historically dry periods, this target is lower and can therefore be met with lower native flows. Differences in streamflow at the Arkansas River at Las Animas gage are primarily due to occasional spills of water during high flow periods from the Upper Basin when reservoirs are full. These spills occur because simulated reservoir contents during high flow periods are slightly higher than historical contents, causing water to be released downstream. An underlying assumption of the Daily Model is that the simulated decrees for any changed water rights (changes-in-use, alternate points-of-diversion and exchanges) were developed and are operated in a manner that would not injure senior water rights or the ability of Colorado to meet terms of the Arkansas River Compact. Therefore, simulated diversions are curtailed according to Colorado Water law when flow is insufficient and historical flow at Las Animas is maintained. The assumptions made regarding streamflow at the Arkansas River at Las Animas gage are appropriate for use in the EIS.

Table 46. Calibration Run Average Monthly Summary – Arkansas River at La Junta

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	107	110	3	2.5	21 (2001)
November	118	121	2	1.8	29 (2008)
December	100	99	-1	-0.6	8.3 (1995)
January	140	139	-1	-0.8	-8.3 (2006)
February	128	135	7	5.4	136 (2005)
March	121	125	5	3.9	108 (2005)
April	126	132	6	4.8	290 (2002)
May	543	557	14	2.6	260 (2002)
June	675	675	-1	-0.1	31 (2002)
July	304	302	-2	-0.7	111 (2002)
August	338	342	4	1.1	37 (2002)
September	98	96	-2	-2.0	-27 (1999)
Average	234	237	3	1.2	290 (2002)

Table 47. Calibration Run Average Monthly Summary – Arkansas River at Las Animas

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	117	121	3	3.0	26 (2001)
November	170	170	0	0.2	2.2 (2008)
December	150	151	1	0.8	8.5 (1995)
January	185	185	0	0.2	1.4 (1997)
February	177	186	9	5.1	103 (2005)
March	133	139	6	4.7	87 (2005)
April	107	115	9	8.0	164 (2002)
May	541	560	19	3.4	229 (2002)
June	673	677	4	0.6	23 (2002)
July	293	297	3	1.2	219 (2002)
August	368	376	8	2.1	30 (2002)
September	106	108	1	1.2	20 (2002)
Average	252	258	5	2.1	229 (2002)

Monument Creek

Summaries of the average monthly streamflow and simulated daily streamflow for Monument Creek at Pikeview are shown in Table 48 and Figure 18, respectively. The Monument Creek at Pikeview gage calibrated well, with flows nearly identical during the entire simulation period. There are no simulated diversions or return flows in Monument Creek for the calibration run other than ungaged gains and losses. No calibration or major construction modifications were made to the Daily Model in Monument Creek.

Table 48. Calibration Run Average Monthly Summary – Monument Creek at Pikeview

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference (cfs)	Difference (percent)	Maximum Monthly Difference (percent, year)
October	24	24	0	0.8	18 (2003)
November	21	21	0	0.9	20 (2003)
December	21	21	0	1.1	24 (2004)
January	22	22	0	1.0	21 (2004)
February	28	28	0	0.4	9.3 (2004)
March	59	59	0	0.0	0.5 (2004)
April	83	83	0	0.0	2.0 (2004)
May	52	52	0	0.0	0.5 (2004)
June	42	42	0	0.0	0.4 (2004)
July	48	48	0	0.0	0.4 (2004)
August	27	27	0	0.0	1.0 (2004)
September	38	38	0	0.3	24 (2004)
Average	24	24	0	0.8	18 (2003)

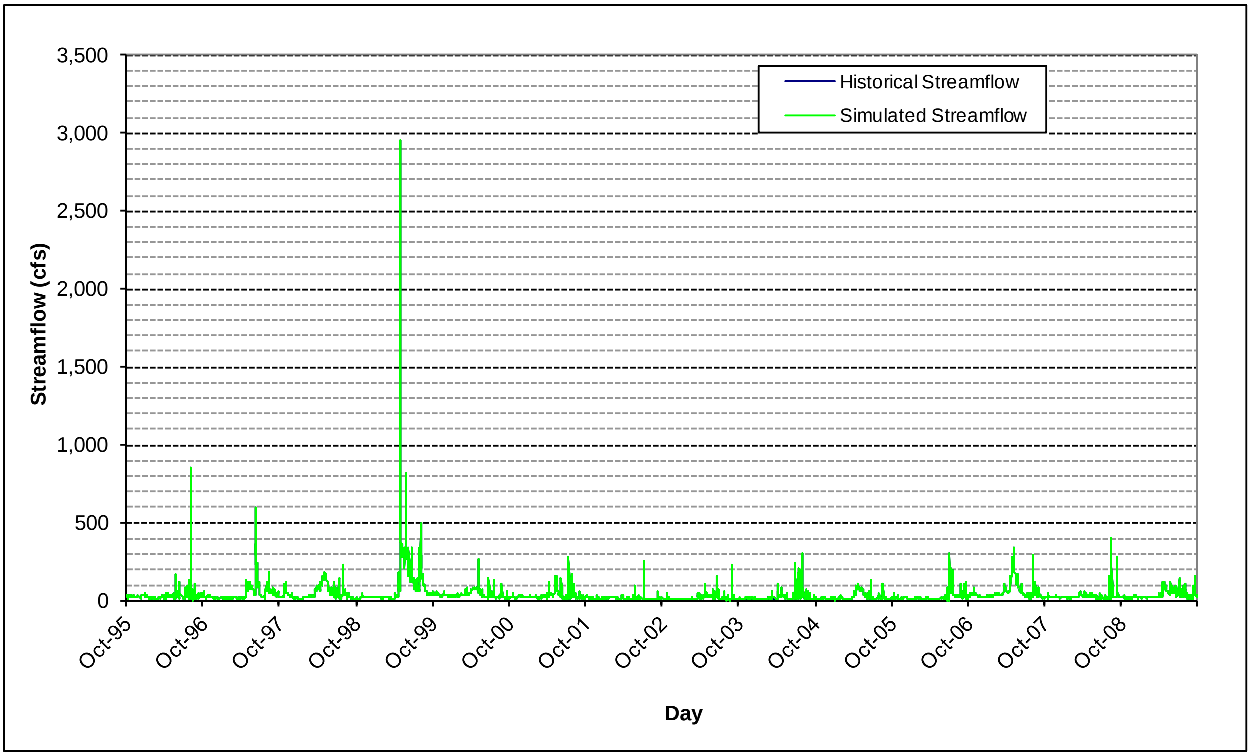

Figure 18. Calibration Run Time-Series Plot - Monument Creek at Pikeview

Fountain Creek

A summary of average monthly values for Fountain Creek at Security is shown in Table 49, while simulated streamflow at the Fountain Creek at Pueblo gage is shown in Table 50 and Figure 19. Most performance measures for the Fountain Creek at Pueblo gage were met. The maximum monthly difference that occurred in July 2008 was during a low flow period where small volumetric differences produce high percent errors. Higher simulated streamflow, such as those in June 2001, occurred because senior water rights in the Arkansas River Basin during this month called out some of the junior water rights in the Fountain Creek Basin. These differences are because, historically, there were some deliveries of leased water or other type of water to Fountain Creek agricultural entities that are not explicitly contained in the Daily Model. Therefore, instead of diverting flow under this type of arrangement, it bypassed the entities and was diverted by Arkansas River Basin entities.

Since the Southern Delivery System EIS, the Cherokee Metro District has changed its discharge location from Sand Creek to re-injecting it into the Upper Black Squirrel Designated Basin. This is reflected in the Daily Model for this EIS by removing the return flow at Sand Creek in existing conditions and future conditions runs. Historical discharge to Sand Creek is still used in the calibration.

Table 49. Calibration Run Average Monthly Summary - Fountain Creek at Security

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	122	125	2	2.0	7.6 (2007)
November	117	118	1	1.0	-4.5 (2008)
December	95	97	2	1.7	5.7 (2003)
January	102	104	2	1.8	-8.3 (2009)
February	115	117	2	1.6	5.1 (2006)
March	126	129	3	2.1	7.5 (2006)
April	198	198	1	0.3	-5.3 (2009)
May	256	257	1	0.3	-6.0 (2008)
June	219	221	2	0.8	11 (2001)
July	184	185	1	0.6	8.0 (2005)
August	231	230	0	-0.2	-11 (2009)
September	144	142	-2	-1.5	-11 (2009)
Average	159	160	1	0.7	-11 (2009)

Table 50. Calibration Run Average Monthly Summary - Fountain Creek at Pueblo

Month	Historical Streamflow (cfs)	Simulated Streamflow (cfs)	Difference		Maximum Monthly Difference (percent, year)
			(cfs)	(percent)	
October	120	123	2	2.0	12 (2001)
November	150	151	1	0.6	-3.4 (2008)
December	126	127	1	1.1	5.1 (2000)
January	131	133	1	1.1	-7.1 (2009)
February	144	145	1	0.9	-4.7 (2009)
March	149	152	3	1.7	6.2 (2005)
April	207	209	1	0.7	6.6 (2001)
May	258	259	1	0.5	-13 (2008)
June	227	229	2	0.8	25 (2001)
July	176	178	2	0.9	-37 (2008)
August	245	245	0	-0.2	18 (2001)
September	124	122	-2	-1.8	-15 (2009)
Average	172	173	1	0.7	-37 (2008)

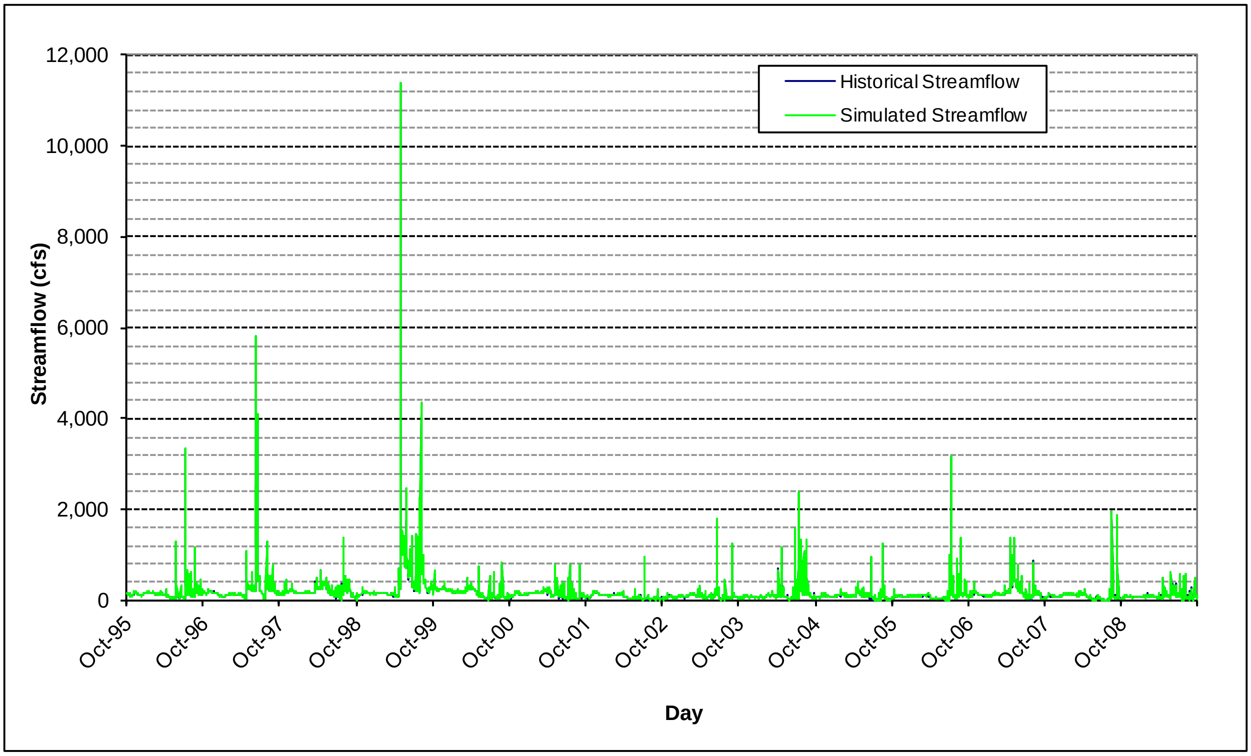

Figure 19. Calibration Run Time-Series Plot - Fountain Creek at Pueblo

Storage

Verification and calibration results at reservoirs are presented for Turquoise Lake, Twin Lakes, and Pueblo Reservoir. Although calibration of Lake Henry and Lake Meredith was performed and is also shown herein, these reservoirs are not used as key performance measures because of the complexity in operations.

Turquoise Lake

Average monthly simulated reservoir contents for Turquoise Lake are shown in Table 51, while simulated end-of-day contents are shown in Figure 20. Simulated contents generally track slightly lower during most months. Peak storage contents are occasionally lower than historical contents due to the methods used to determine from which account Colorado Springs and Aurora draw water for the Otero Pump Station. The simulated choice of accounts may not exactly match historical system operations, but is not expected to affect the overall performance of the model when comparing AVC alternatives.

Table 51. Calibration Run Average Monthly Summary – Turquoise Lake

Month	Historical Contents (ac-ft)	Simulated Contents (ac-ft)	Difference (ac-ft)	Difference (percent)	Maximum Monthly Difference (percent, year)
October	105,907	105,242	-665	-0.6	22 (2008)
November	100,993	102,656	1,663	1.6	40 (2001)
December	94,542	96,236	1,694	1.8	28 (2008)
January	87,735	87,444	-291	-0.3	-19 (2005)
February	79,853	78,913	-940	-1.2	-23 (1998)
March	71,474	75,822	4,348	6.1	34 (1999)
April	70,365	71,814	1,448	2.1	37 (2001)
May	74,773	73,438	-1,335	-1.8	40 (2003)
June	103,585	100,315	-3,270	-3.2	22 (2001)
July	115,121	112,244	-2,877	-2.5	-23 (2005)
August	113,423	105,956	-7,467	-6.6	-29 (2009)
September	109,108	103,018	-6,090	-5.6	-23 (2005)
Average	93,988	92,843	-1,145	-1.2	40 (2001)

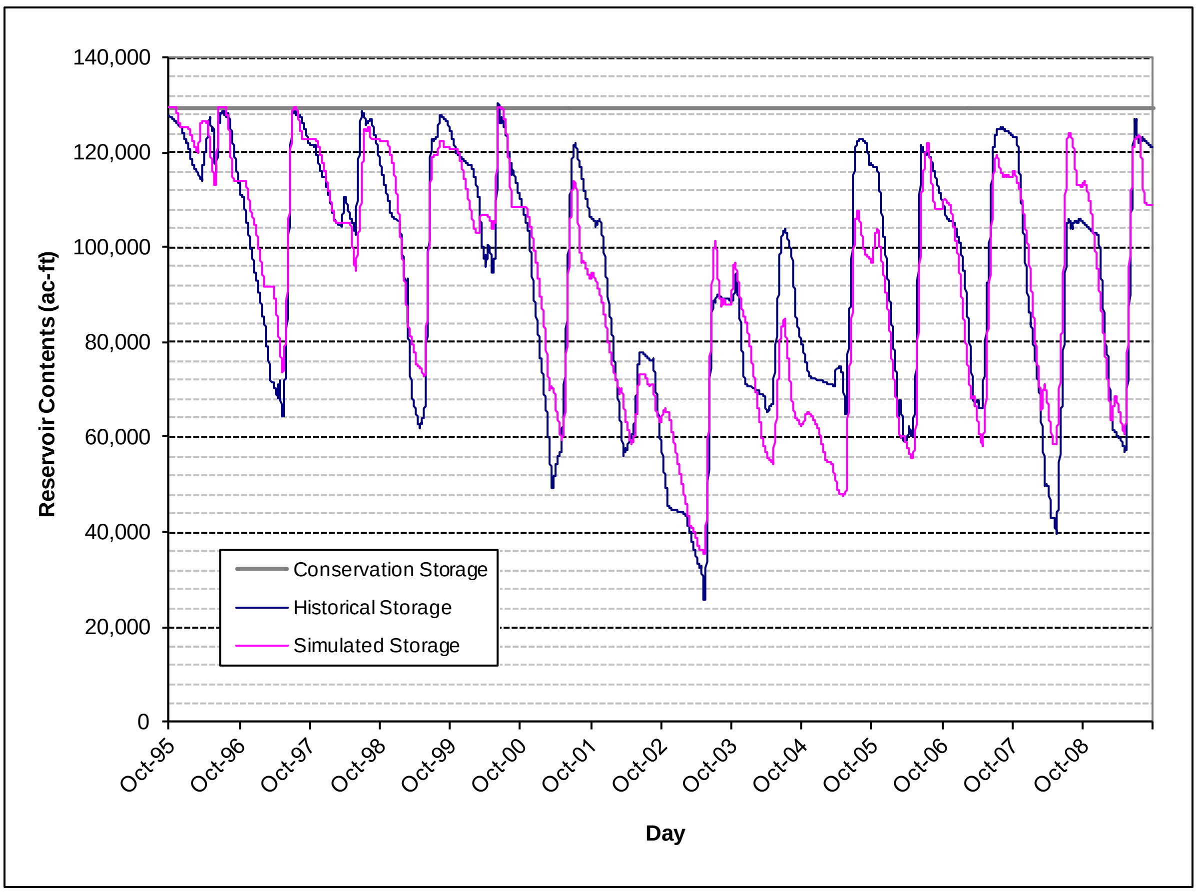

Figure 20. Calibration Run Time-Series Plot - Turquoise Lake

Twin Lakes

Table 52 and Figure 21 show observed historical and simulated contents in Twin Lakes. The Daily Model generally simulates Twin Lakes storage contents well with simulated contents slightly higher than historical contents. The Daily Model shows on average more storage in

Twin Lakes than observed historically. As discussed for Turquoise Lake, differences in Twin Lakes contents are primarily due to the operations of the Fry-Ark Project in relation to the Upper Arkansas Flow Management Program and the operations of the Otero Pump Station. Storage differences in some years result from historical conditions outside of the model assumptions, such as when Reclamation makes unique decisions regarding excess releases from multiple storage accounts to accommodate forecasted inflows. These unique annual decisions are not simulated in the Daily Model.

Higher Twin Lakes contents also result from operational difference in Homestake Reservoir, as the Daily Model follows strict operational rules for operation of Homestake Reservoir and Pipeline, and does not accommodate exceptions to rules when the reservoir may be operated to meet other unspecified goals. In particular, during both 2008 and 2009, the Daily Model moved less water from the Upper Basin to Pueblo Reservoir than was done in historical operations. The Daily Model does not simulate most paper exchanges between non-project accounts, which may differ slightly from actual historical practices during these two years. This results in higher simulated storage contents in Twin Lakes, and lower streamflow at the Lake Creek below Twin Lakes gage during these two years. Because the differences in operations seemed to be limited to these two years, and these differences are not anticipated to be a differentiator between alternatives, except as described in previous sections, additional constructs to simulate spring release patterns during 2008 and 2009 were not added to the model.

Table 52. Calibration Run Average Monthly Summary – Twin Lakes

Month	Historical Contents (ac-ft)	Simulated Contents (ac-ft)	Difference		Maximum Monthly Difference (percent, year)
			(ac-ft)	(percent)	
October	118,366	121,798	3,433	2.9	13 (2008)
November	117,037	119,268	2,231	1.9	-16 (2003)
December	114,333	115,781	1,448	1.3	19 (2008)
January	109,509	111,641	2,132	1.9	-14 (2004)
February	105,095	107,058	1,962	1.9	16 (2000)
March	102,560	103,990	1,429	1.4	13 (2002)
April	103,026	102,784	-242	-0.2	12 (2000)
May	106,629	107,375	746	0.7	14 (1998)
June	121,903	126,365	4,462	3.7	24 (1997)
July	126,471	129,449	2,978	2.4	-13 (2006)
August	119,804	125,956	6,152	5.1	15 (1997)
September	117,665	122,747	5,082	4.3	16 (1999)
Average	113,581	116,235	2,654	2.3	24 (1997)

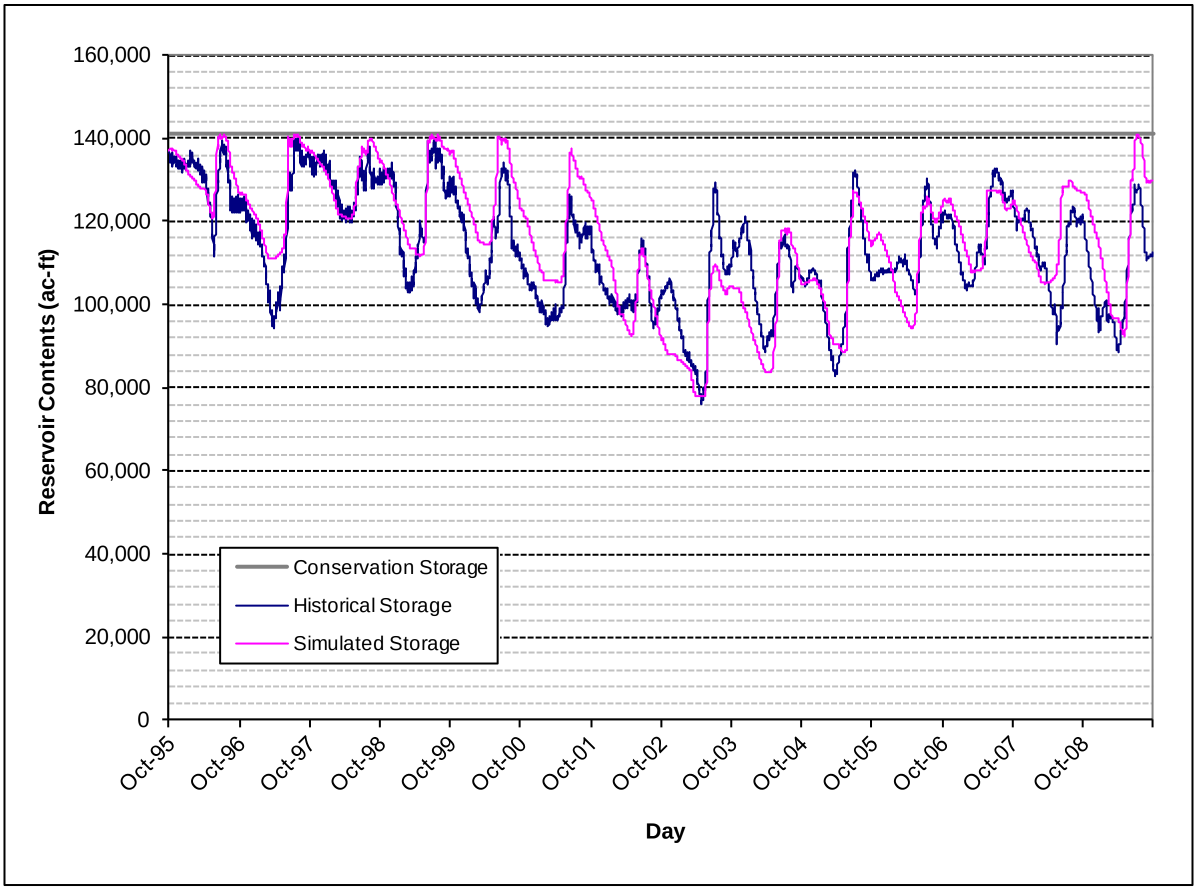

Figure 21. **Calibration Run Time-Series Plot - Twin Lakes**

Pueblo Reservoir

Average monthly simulated contents in Pueblo Reservoir are shown in Table 53, while daily contents are shown in Figure 22. Overall, the average historical storage in Pueblo Reservoir during the calibration period was 174,410 acre-feet, while the simulated average storage was 176,703 acre-feet. This represents a difference of 2,293 acre-feet, or 1.3 percent. Differences between historical and simulated storage are due to a combination of factors, including difference in the balance of storage between Upper Basin Fry-Ark reservoirs (Turquoise Lake and Twin Lakes) and Pueblo Reservoir, and due to differences in how isolated contract exchanges were operated historically. Differences causing the imbalance between Fry-Ark reservoirs are due to timing of releases from Upper Basin reservoirs as discussed at the Arkansas River near Wellsville gage. Differences in operations due to contract exchanges occur when demands for Fry-Ark Project water were met by making releases from non-Fry-Ark Project storage space in Twin Lakes and Turquoise Lake using contract exchanges. Because these types of operations are rare and do not occur at regular intervals (i.e. they are performed based on operational decisions at the time and are not easily predictable), these operations are not coded into the model and an imbalance in storage occurs between Upper Basin and Lower Basin reservoirs. Because the reservoir fully meets the performance targets, the differences were deemed acceptable for the calibration period.

Table 53. Calibration Run Average Monthly Summary – Pueblo Reservoir

Month	Historical Contents (ac-ft)	Simulated Contents (ac-ft)	Difference		Maximum Monthly Difference (percent, year)
			(ac-ft)	(percent)	
October	147,673	149,677	2,004	1.4	10 (1998)
November	149,944	152,415	2,471	1.6	9.3 (2006)
December	163,859	167,342	3,483	2.1	9.6 (1998)
January	181,040	185,894	4,854	2.7	9.4 (2005)
February	197,317	202,699	5,383	2.7	10 (2009)
March	207,580	211,319	3,739	1.8	9.5 (2005)
April	199,027	201,034	2,007	1.0	11 (2009)
May	187,568	188,229	662	0.4	13 (2008)
June	180,224	180,453	229	0.1	18 (2007)
July	173,221	173,426	206	0.1	9.2 (1996)
August	158,975	160,208	1,232	0.8	9.5 (2007)
September	147,839	149,253	1,413	1.0	9.9 (2003)
Average	174,410	176,703	2,293	1.3	18 (2007)

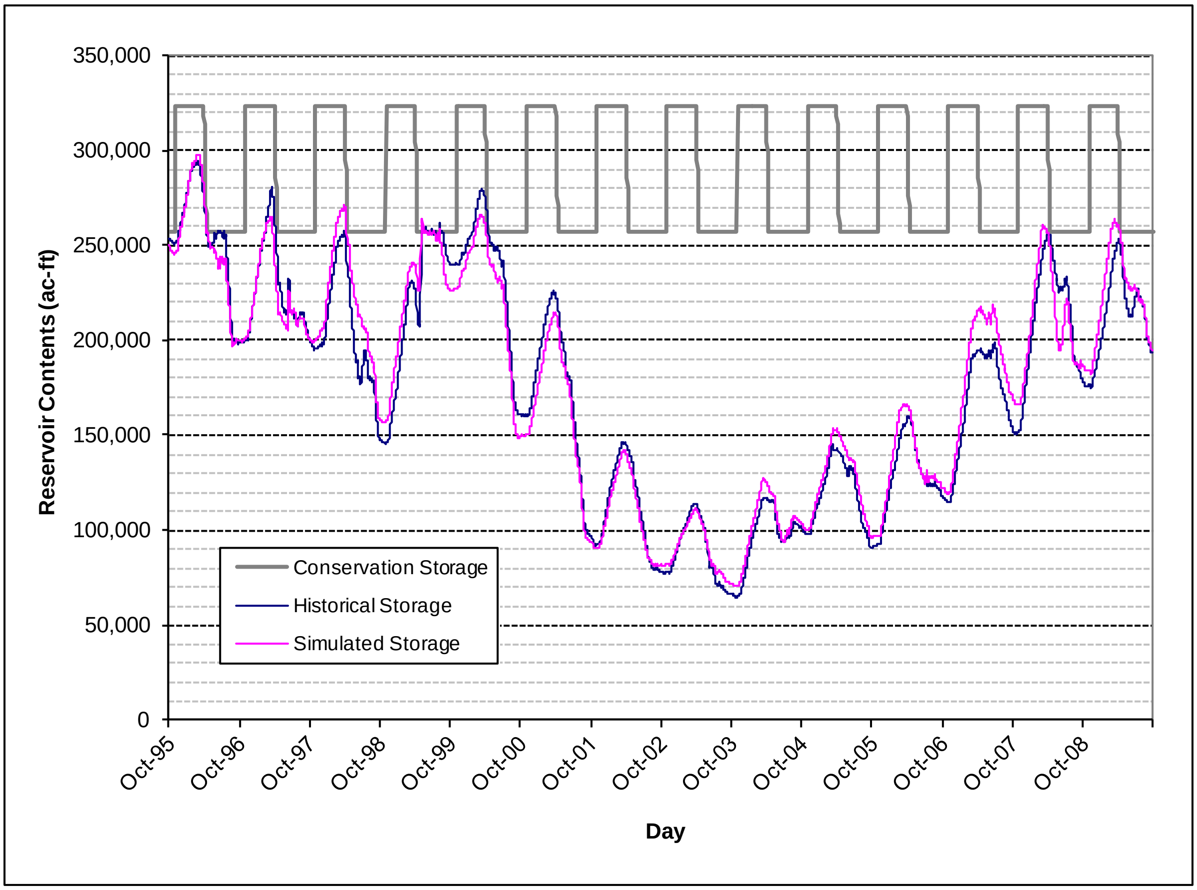

Figure 22. Calibration Run Time-Series Plot - Pueblo Reservoir

Fry-Ark System Storage

The Daily Model occasionally shows a general imbalance of storage between the Upper Basin reservoirs (Turquoise Lake and Twin Lakes) and Pueblo Reservoir. In order to verify this, total system contents in the three Fry-Ark reservoirs was investigated. Table 54 presents the average monthly historical and simulated reservoir contents for Fry-Ark Project reservoirs (Turquoise Lake, Twin Lakes, and Pueblo Reservoir) while a time-series plot is presented in Figure 23. The simulated total system reservoir contents are always within 20,000 to 40,000 acre-feet of historical contents, which represent a maximum difference of four to eight percent. On average, simulated contents are within one percent of historical contents. Differences that occur between historical and simulated Fry-Ark Project storage contents are generally differences in the storage of non-Fry-Ark Project water in Fry-Ark and non-Fry-Ark storage facilities, such as Homestake Reservoir, Clear Creek Reservoir and the Colorado Canal System.

As with Pueblo Reservoir, total Fry-Ark contents fully meet the performance targets for calibration, and the differences for total contents were deemed acceptable for the calibration period.

Table 54. Calibration Run Average Monthly Summary – Fry-Ark Project Reservoirs

Month	Historical Contents (ac-ft)	Simulated Contents (ac-ft)	Difference (ac-ft)	Difference (percent)	Maximum Monthly Difference (percent, year)
October	371,945	376,717	4,771	1.3	6.8 (2008)
November	367,974	374,339	6,366	1.7	6.8 (2008)
December	372,733	379,358	6,625	1.8	6.4 (2008)
January	378,285	384,979	6,694	1.8	6.2 (2009)
February	382,265	388,670	6,405	1.7	6.0 (2009)
March	381,614	391,131	9,517	2.5	6.9 (1999)
April	372,419	375,632	3,213	0.9	7.1 (1999)
May	368,970	369,042	72	0.0	6.5 (2004)
June	405,711	407,133	1,422	0.4	4.9 (2004)
July	414,813	415,120	307	0.1	5.7 (2004)
August	392,203	392,120	-83	0.0	5.2 (2004)
September	374,613	375,018	405	0.1	5.5 (2004)
Average	381,979	385,780	3,801	1.0	7.1 (1999)

Note:

Includes total storage in Turquoise Lake, Twin Lakes, and Pueblo Reservoir.

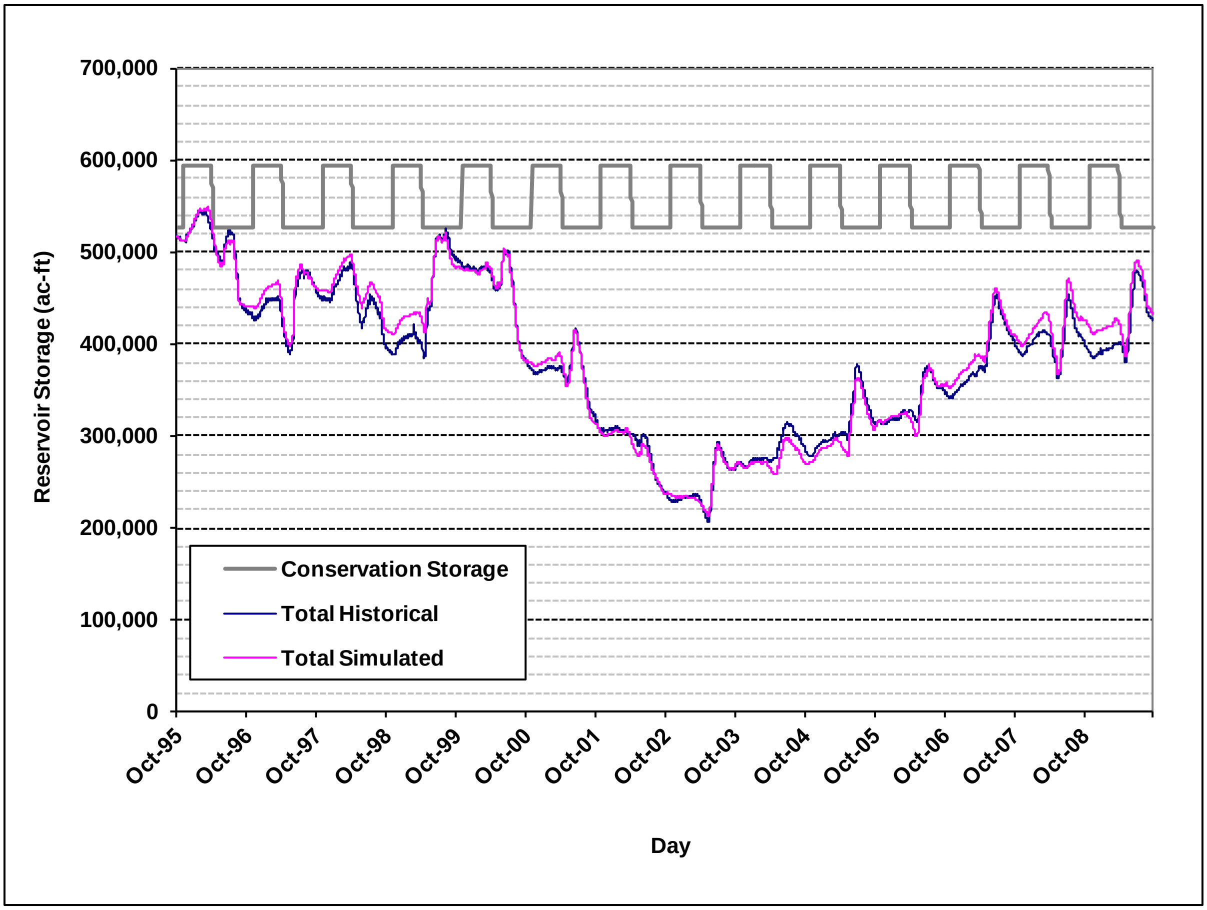

Figure 23. Calibration Run Time-Series Plot - Fry-Ark Project Reservoirs

Colorado Canal System Storage

Because of municipal exchanges of Colorado Canal system yields into Pueblo Reservoir and Upper Basin reservoirs, operations of Colorado Canal system reservoirs are directly tied into operations and storage contents of Fry-Ark project reservoirs. Therefore, although Colorado Canal system reservoirs are not a key location for calibration of the model, it is useful to examine operations of this system as they relate to overall Daily Model operations.

Figure 24 presents a summary of observed historical and simulated combined storage in Lake Henry and Lake Meredith, while Figure 25 presents a summary of storage in Fry-Ark and Colorado Canal system reservoirs. In general, given the complex nature of system operations for the Colorado Canal system, simulated contents match historical contents quite well. The largest differences between historical and simulated storage are during water years 2002-2006, and are due to unique, non-reoccurring exchange scenarios that are not captured in coded model exchange constructs. The combined Fry-Ark and Colorado Canal system reservoirs, however, shows that although storage is located in different locations, the difference in overall mass-balance of storage on the Eastern Slope is maintained. The slightly higher than historical storage amounts on the Eastern Slope are generally attributed to differences in the storage of non-Fry-Ark Project water in Fry-Ark and non-Fry-Ark storage facilities, as discussed in the previous section.

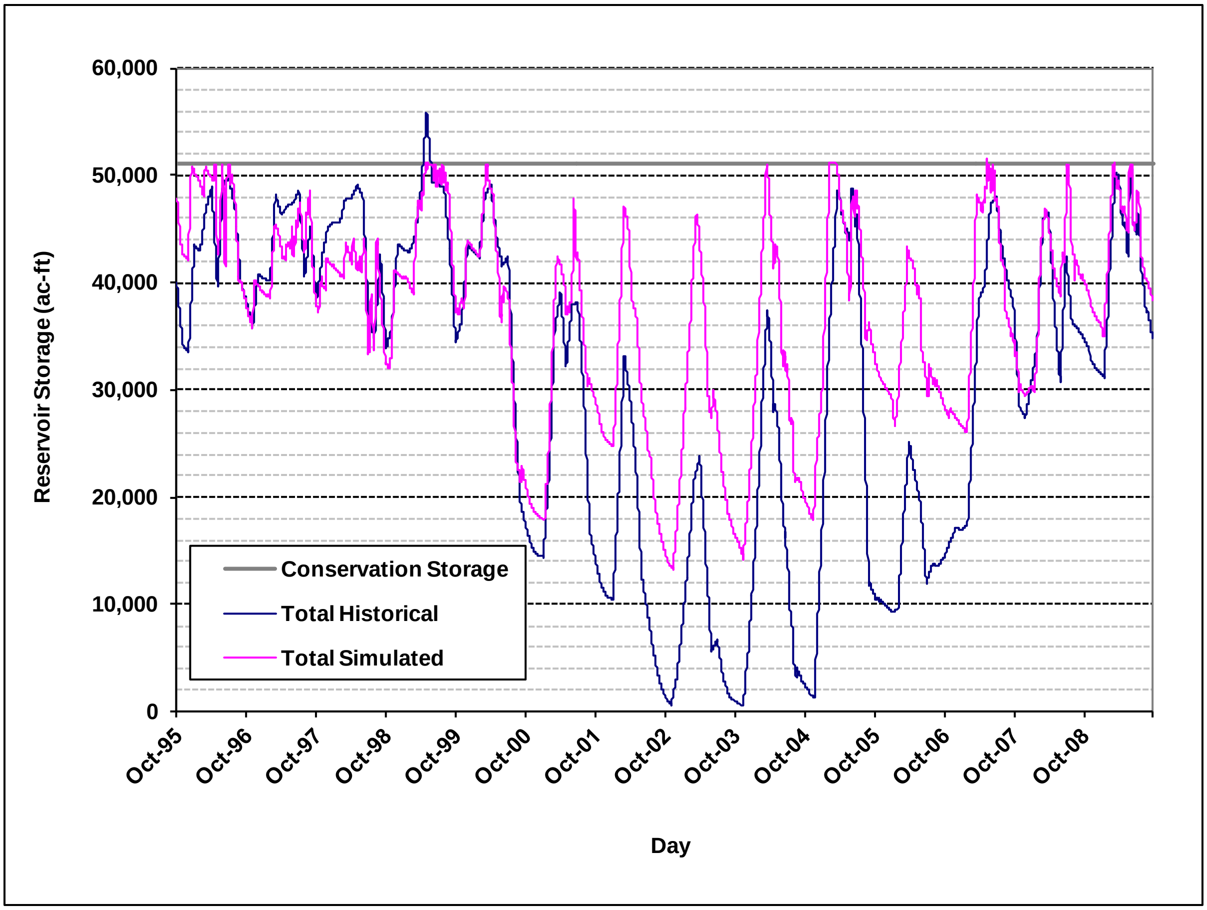

Figure 24. Calibration Run Time-Series Plot - Colorado Canal System Reservoirs

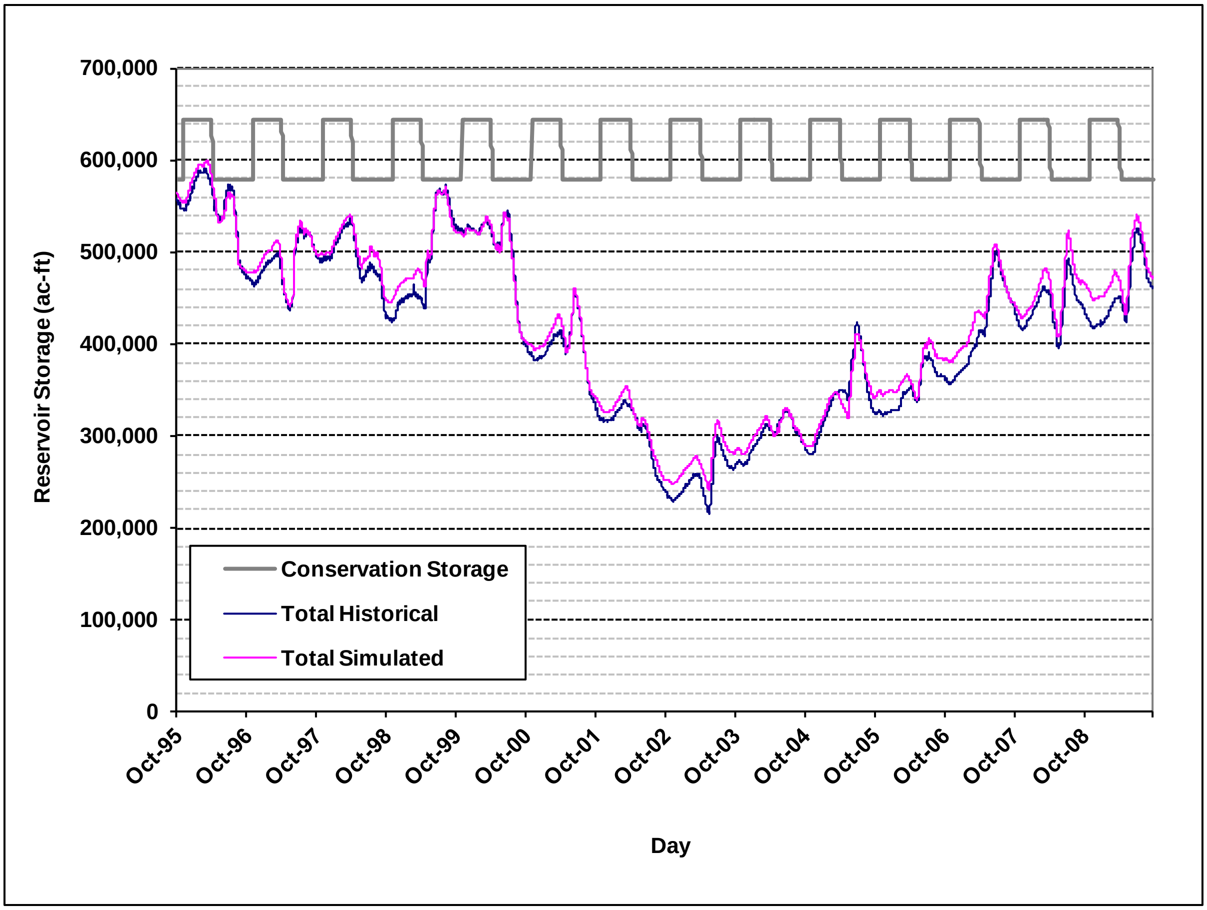

Figure 25. Calibration Run Time-Series Plot - Fry-Ark and Colorado Canal System Reservoirs

Major Diversions

Because the calibration run is a simulation of historical conditions and uses historical demands, it should be able to reproduce historical deliveries to demand nodes during the 1996-2009 study period. Table 55 and Table 56 present summaries of annual simulated deliveries to demand nodes in the Arkansas and Fountain Creek Basins. The calibration run shows some shortages, primarily at junior demand nodes. These shortages occur because the Daily Model does not necessarily include deliveries of leases and other water not delivered under a direct flow water right or through storage ownership. Because junior demands are often beneficiaries of these types of arrangements, they are affected when these operations are not explicitly simulated.

Historical Restoration-of-Yield Storage operations are simulated in the model for the City of Aurora and Colorado Springs Utilities for the calibration. Non-native water is stored in “excess capacity” space in Holbrook Reservoir. Contract exchanges are then used to exchange to Pueblo Reservoir. Ongoing operations are simulated similarly in future conditions runs.

Table 55. Calibration Run Simulated Demands - Arkansas River Basin

Node Name	Node Description	Average Annual Historical Diversion (ac-ft)	Average Annual Simulated Diversion (ac-ft)	Average Annual Shortage (ac-ft)	Percent Short (%)
Hpipe_Aur	Homestake Pipeline demand - Aurora	30,523	28,908	1,615	5.3
Hpipe_CSU	Homestake Pipeline demand - Colorado Springs	51,918	50,362	1,555	3.0
FAW_DemBV	Fry-Ark municipal demand - Entities West of Pueblo near Buena Vista	0	0	0	---
FAW_DemSa	Fry-Ark municipal demand - Entities West of Pueblo near Salida	0	0	0	---
SoCañon	South Cañon Ditch demands	14,056	13,988	69	0.5
CCHyd	Cañon City Hydraulic Ditch demand	25,454	25,392	62	0.2
FAW_DemCC	Fry-Ark municipal demand - Entities West of Pueblo near Cañon City	0	0	0	---
CCWW	Cañon City Water Works demand	5,881	5,881	0	0.0
OilCk	Oil Creek Ditch demand	15,408	15,255	153	1.0
FrCoDit	Fremont County Ditch demand	7,393	7,382	11	0.1
MinnDiv	Minnequa Canal demand	61,051	60,905	146	0.2
Bess	Bessemer Ditch demand	0	0	0	---
PBWW_WRTot	Board of Water Works of Pueblo demands at WTP	28,368	28,348	20	0.1
PblWest	Pueblo West demand	3,990	3,990	0	0.0
FAE_DemPb	Fry-Ark municipal demand - Entities East of Pueblo near Pueblo	0	0	0	---
FAF_Dem	Fry-Ark municipal demand - Fountain Valley Authority	0	0	0	---
PblFish	Pueblo Fish Hatchery demand	19,557	19,557	0	0.0
WestPbl	West Pueblo Ditch demands	0	0	0	---
HampBell	Hamp Bell ditch demand	0	0	0	---
Commanche	Comanche Power Plant demand	8,978	8,978	0	0.0
RivDairy	Riverside Dairy demand	309	299	9	3.0
WestPlDiv	West Plains Energy demands	22,056	22,042	14	0.1
StChPump	St. Charles Mesa Pumping Plant demands	44	44	0	0.0
BoothOrc	Booth Orchard demand	0	0	0	---
Excelsior	Excelsior Ditch Demand	3,022	3,022	0	0.0
Collier	Collier Ditch demand	1,124	1,124	0	0.0
CCD	Colorado Canal Diversions	83,359	82,237	1,123	1.3
RFHighline	Rocky Ford Highline Canal demand	0	0	0	---
Oxford	Farmer's Oxford Ditch demand	0	0	0	---
OteroD	Otero Ditch demands	0	0	0	---
OlneySpgs	Olney Springs demand	0	0	0	---
Catlin	Catlin Canal demand	0	0	0	---
Holbrook	Holbrook Canal demand	0	0	0	---
RockyFord	Rocky Ford Ditch demand	10,968	10,911	57	0.5
FLStorage	Fort Lyon Storage Canal demand	48,511	48,482	29	0.1
FtLyon	Fort Lyon Canal demand	0	0	0	---
FAE_DemLJ	Fry-Ark municipal demand - Entities East of Pueblo near La Junta	0	0	0	---
LACons	Las Animas Consolidated demand	0	0	0	---
Town	Town Ditch demands	0	0	0	---
FAE_DemLa	Fry-Ark municipal demand - Entities East of Pueblo near Las Animas	0	0	0	---
Total		441,971	437,109	4,862	1.1

Table 56. Calibration Run Simulated Demands – Fountain Creek Basin

Node Name	Node Description (1)	Average Annual Historical Diversion (ac-ft)	Average Annual Simulated Diversion (ac-ft)	Average Annual Shortage (ac-ft)	Percent Short (%)
FMIC	Fountain Mutual Irrigation Company demand	14,042	13,975	67	0.5
Stubbs	Stubbs & Miller Ditch demand	394	359	35	8.9
Chilcotte	Chilcotte Ditch demand	925	909	16	1.8
Crabb	Crabb Ditch demand	0	0	0	---
Lock	Lock Ditch demand	0	0	0	---
Lock2	Lock Ditch No 2 demand	0	0	0	---
Liston	Liston and Love Ditch demand	0	0	0	---
Owen	Owen and Hall Ditch demand	4,308	4,238	70	1.6
Reed	Reed Ditch No 2 demand	0	0	0	---
Talcott	Talcott & Cotton Ditch demand	1,144	1,119	24	2.1
Dr_Ditch	Dr. Rogers demand	1,668	1,547	121	7.3
Jax	Jackson and Burke Ditch demand	13	13	0	0.0
Burke	Burke Ditch demand	1,965	1,712	253	12.9
Toof	Toof & Harmon Ditch demand	200	169	30	15.1
Young	Young and Callaway Ditch demand	0	0	0	---
Wd_Valley	Wood Valley Ditch demand	1,912	1,779	132	6.9
Hobson	Hobson Ditch demand	0	0	0	---
Total		26,571	25,820	751	2.8

Notes:
(1) Because separate records were unavailable, demands for several of the smaller ditches are implicitly included in ungaged gains and losses.

Overall, the calibration run under simulates deliveries by approximately one percent on average in the Arkansas River Basin. Most of the under simulations occur during the 2002 drought, when not all emergency leases and other measures are coded in the Daily Model. In the Fountain Creek Basin, diversions are underestimated by approximately three percent. The differences in Fountain Creek occur because not all leases that have historically occurred with Fountain Creek agricultural entities are coded into the Daily Model.

Long-Term Historical Simulation

To evaluate whether the portion of the study period prior to the calibration period (1982-1995) is operating as expected, a historical model run of the entire study period was performed. The calibration period (1996-2009) was chosen because river operations remained fairly consistent throughout the period and are similar to the way the system is currently operated. Prior to this period, there were several differences in water use and operations that are difficult to simulate given the "hard-wired" operational code in the model. Some of the more significant differences that affect operations of the model during this time include:

- Final construction of Twin Lakes was not completed until 1981. Although this does not affect the study period, it does affect the model warm-up period. Prior to this time, there was no Fry-Ark storage in Twin Lakes.

- The Twin Lakes Pipeline (the pipeline from Twin Lakes to the Otero Pump Station) did not begin operations until late 1985.

- The Upper Arkansas Voluntary Flow Management Program did not begin operations until 1990.

- Significant exchanges out of the Colorado Canal system did not begin until the early 1990s.

Although there are differences in historical operations within the study period, the model should be expected to perform reasonably well for historical conditions throughout the entire study period. Because reservoir storage, particularly in Pueblo Reservoir, is a key indicator of model performance, only reservoir plots were used to review the long-term historical simulation.

A time-series summary of the long-term simulated historical and observed historical contents in Pueblo Reservoir is presented in Figure 26. Simulated reservoir contents in Pueblo Reservoir match a consistent difference between historical and simulated conditions, except for three fairly discrete events during the period, which occur during the first two years of the study period (1983 through 1984) and during water year 1989.

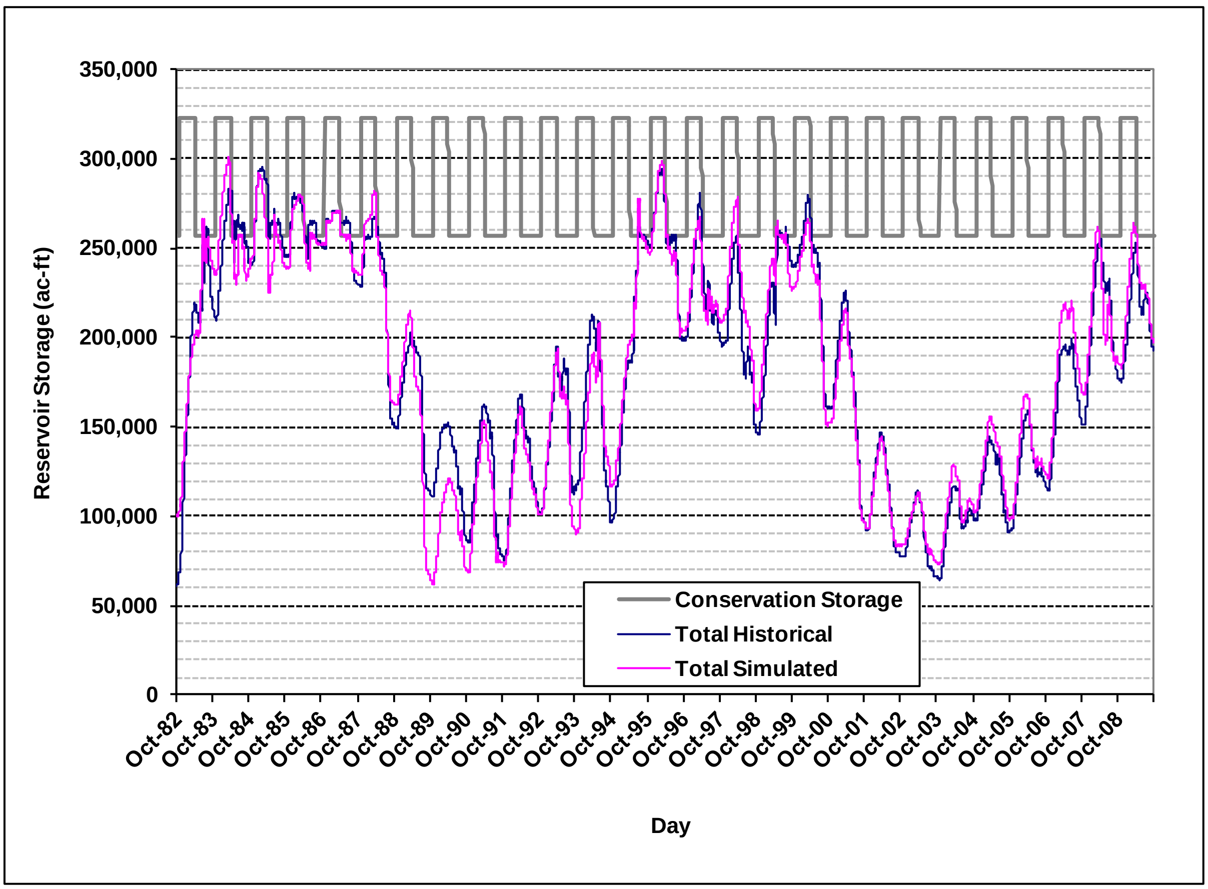

Figure 26. Long-Term Historical Run Time-Series Plot - Pueblo Reservoir Contents

Differences in the simulation in the early 1980s are due to differences in river basin operations during the early portion of the study period, primarily with the Colorado Canal system. Historically, prior to the purchase of majority shares in the system by municipal entities, the

Colorado Canal system took substantial deliveries of Twin Lakes Project water from Twin Lakes. However, this is no longer the case and these types of operations were not simulated in the Daily Model. This in turn results in more storage in Pueblo Reservoir because Twin Lakes Project storage is full and Pueblo Reservoir diverts more native flows.

Differences in the simulation in 1989 are due to similar Twin Lakes and Colorado Canal issues as in the early 1980s. During the spring months of 1989, a significant amount of water was moved out of Twin Lakes Project storage space into Pueblo Reservoir (presumably using a short-term contract) to make room for native and transmountain imports. The Daily Model in its current configuration is not set up to perform this type of operation. Once water is stored in municipal Twin Lakes accounts, it cannot be moved downstream to other storage facilities because this is not consistent with current operations.

To ensure that the overall mass-balance of storage is maintained between all Fry-Ark Project reservoirs, total contents in Turquoise Lake, Twin Lakes and Pueblo Reservoir was plotted and is shown in Figure 27. As shown, total contents track closely.

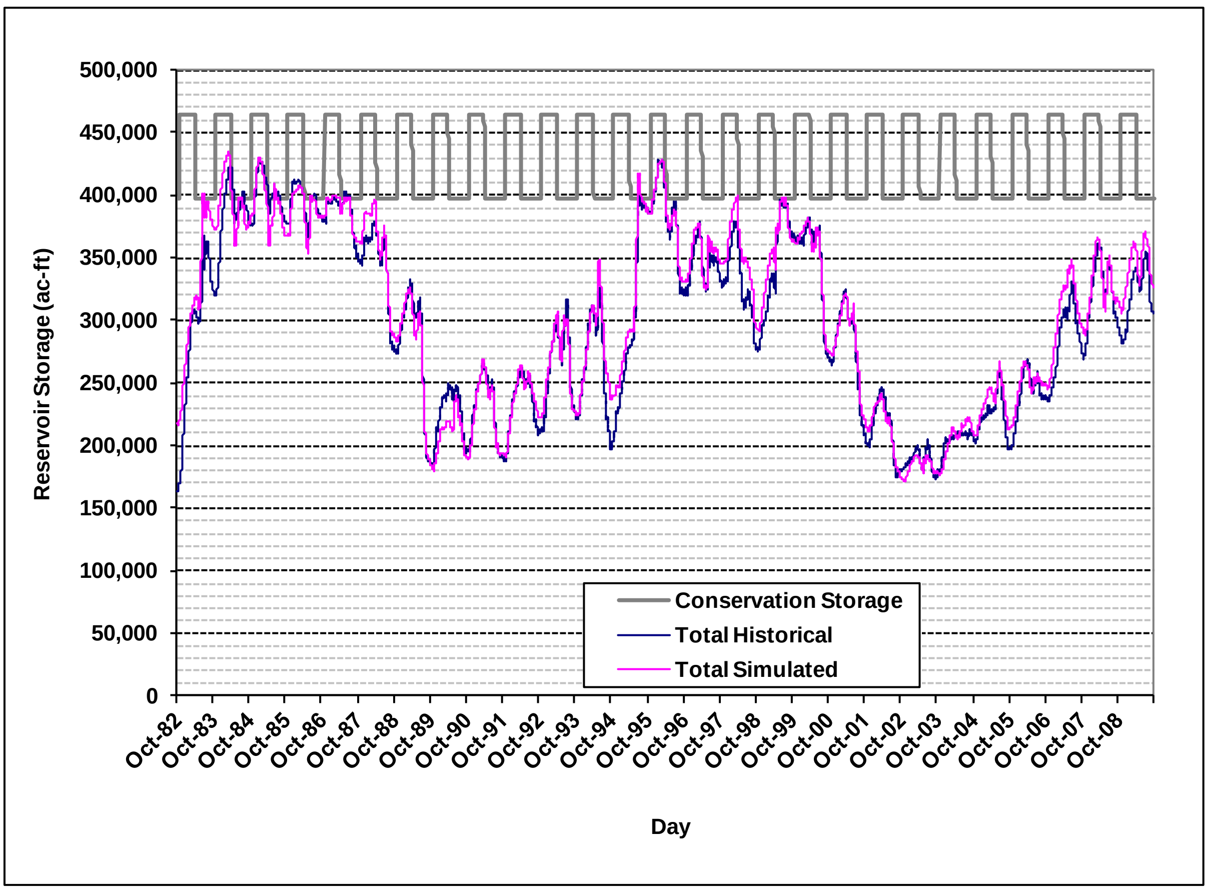

Figure 27. Long-Term Historical Run Time-Series Plot - Fry-Ark Reservoir Contents

Summary of Model Verification and Calibration

Using the procedures described in this memo, the computation accuracy of the Daily Model was verified and the model was calibrated to water year 1996 through 2009 historical data. Although the calibration comparisons with historical conditions show some differences in streamflow and reservoir contents, these differences are explainable and do not have a significant effect on the ability of the model to simulate existing and future conditions and make comparisons between AVC and Master Contract alternatives. Differences between observed and simulated historical conditions are primarily due to decisions made on balancing storage in Fry-Ark facilities, the inability of the model to simulate periodic leases of water between entities, other historical variable annual operating conditions that are outside of normal operational rules and policies, and MODSIM's internal computational accuracy.

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Appendix D.4: Surface Water Hydrology Daily Model Results

Introduction

Appendix D.4 presents direct, indirect and cumulative hydrologic results from the Arkansas River daily simulation model (Daily Model). Direct results include streamflow and/or reservoir storage contents at each node in the model. Indirect results include streamflow stage, reservoir stage (or water surface elevation) and reservoir surface area, which are calculated from the model output using established rating curves from the Office of the State Engineer (State Engineers Office 2003). This data is used as a basis for determining direct and indirect effects (collectively referred to as “direct effects” for convenience) and cumulative effects of the alternatives by other resource studies including aquatic resources, recreation and riparian resources in the EIS.

Description of the Daily Model

The Daily Model simulates hydrologic operations and effects of AVC and Master Contract alternatives and reasonably foreseeable activities in the Arkansas River Basin. This model was originally developed as part of the Southern Delivery System EIS (Reclamation 2008), and expanded for use in the AVC EIS. The Daily Model uses the MODSIM software developed by Colorado State University and Reclamation (Labadie et al. 2000) as the primary model engine, and superimposes existing and future water rights, water development operations, and water demand conditions on historical hydrology. A study period of water years 1982 through 2009 was used in the modeling. Data required for the Daily Model included historical streamflow data, historical and future diversion data, historical storage data, water rights data, and other miscellaneous data. Specific documentation of the Daily Model development can be found in the Southern Delivery System EIS Hydrologic Model Documentation Report (MWH 2008a) and Appendix D.3.

Comparison of Effects

For purposes of comparing effects between alternatives (described in Section 3), simulated streamflow and reservoir contents for the Action alternatives were compared to simulated streamflow and reservoir contents for the No Action Alternative. These are referred to as “direct effects,” which use the direct effects model settings, and “cumulative effects,” which use the cumulative effects model settings (see subsequent descriptions of direct and cumulative effects in this document and in Chapter 4 of the EIS). In addition, simulated streamflow and reservoir contents for the No Action Alternative were compared to the existing conditions run to describe how simulated future conditions for the No Action Alternative vary from existing conditions.

Throughout this document, the following definitions apply to both the direct effects analysis and the cumulative effects analysis.

$$\text{Effects} = \text{Alternative Data} - \text{No Action Data}$$

$$\text{Effects (\%)} = \frac{\text{Alternative Data} - \text{No Action Data}}{\text{No Action Data}}$$

To calculate direct effects, data from the direct effects analysis is used. To calculate cumulative effects, data from the cumulative effects analysis is used.

Data Summaries

In order to provide a concise description of the hydrologic analysis results, the information presented herein is a condensed summary of the Daily Model results. Complete results can be found on the AVC EIS website at http://www.usbr.gov/avceis. The website includes the following results at numerous streamflow locations, reservoirs, and other data points simulated by the Daily Model.

- Time-series data for the study period (1982-2009) tables and charts
- Daily overall average at future demands, representative dry and wet-year summary tables and charts
- Mean monthly overall average at future demands, representative dry and wet-year summary tables
- Mean annual overall average at future demands

Both mean and median statistics at simulated future demands are presented in this document. Median value is a non-parametric statistic that is the value in which there is the same number of data points greater than the value as there is less than the value. Unlike mean values, median values are unaffected by extremely low or high values in the data set. In this report, median values are useful in analyzing typical flow through facilities, such as pipelines and water treatment plants, and how often the flow is at capacity.

Monthly averages for a typical dry year and a typical wet year are displayed in tables in this document, as well as time series graphs for the representative years. Time series graphs are used to depict fluctuations on a daily time step, avoiding the “smoothing” effect of averaging the entire dataset. To select the representative years the historical recorded “most probable flow at Salida” was analyzed from 1966 to 2010 and years were ranked from driest to wettest. Most probable flow at Salida forecasts are made by the U.S. Department of Agriculture and the Natural Resources Conservation Service in their “Basin Outlook Reports” (Natural Resource Conservation Service 2005). These flow forecasts are generated using computerized statistical simulation models that incorporate snow water equivalent values from SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño/Southern Oscillation data. The 50 percent exceedance level is evaluated for the April through September forecast period for each available month (typically January to June) to determine “wet,” “normal” and “dry” years. Using these reports to rank the years from driest to wettest show the driest year on record is 2002, and the wettest is 1995. Values for “typical” dry and wet years were chosen as the 11^{th} and 39^{th} ranked years in the 45 year dataset, or 2004 and 1997, respectively. Figure 1 depicts the wet and dry year ranking with the wettest, driest and the typical wet and dry years highlighted.

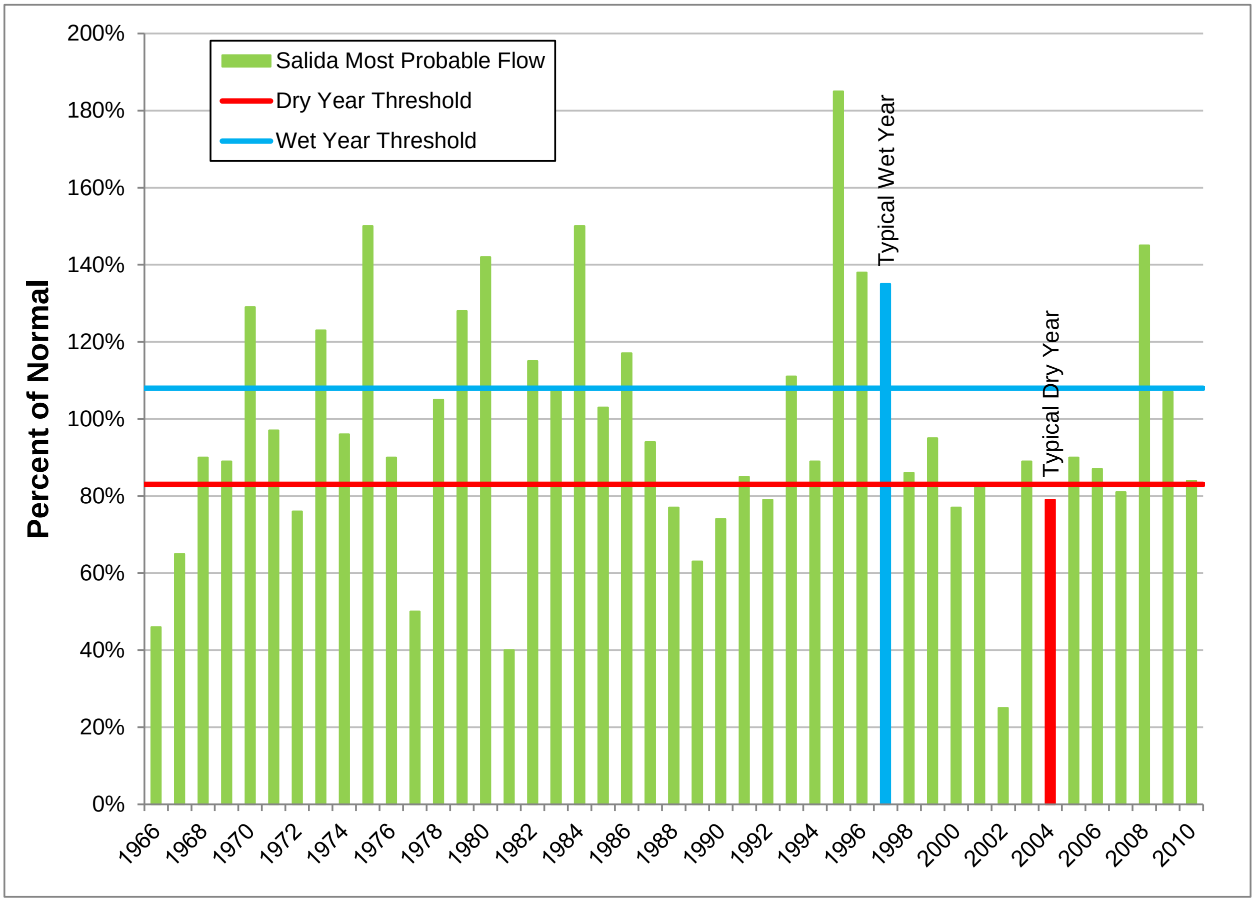

Figure 1. Salida Most Probable Flow Percent of Normal

Development of Indirect Hydrologic data

The Daily Model directly outputs streamflow data in ac-ft per day and reservoir storage contents in ac-ft. Daily volumetric streamflow data are converted into average daily streamflow in cfs by dividing the value by 1.9835, or mgd by dividing the value by 3.07. Reservoir volume in ac-ft is the standard unit for reporting in this document, and thus does not need to be converted.

Volumetric streamflow and reservoir data output from the Daily Model can be used to estimate streamflow depth and reservoir surface area and depth. The analysis of the affected environment described in the Water Resources Technical Report (MWH 2008b) includes collection and development of rating curves at each streamflow gage and at each reservoir in the study area. These same rating curves and methods were used to translate volumetric streamflow data into daily depth and volumetric reservoir contents into water surface depth and water surface area.

Model Settings for Effects Analyses

Simulations were performed for existing conditions, direct effects and cumulative effects. The existing conditions simulation was performed to provide a description of current conditions in the Arkansas River Basin, prior to any AVC alternative being implemented. Direct effects are intended to isolate the future effects of the alternatives, while cumulative effects evaluate the effects of the alternatives in conjunction with reasonably foreseeable future activities in the study area. Direct effects generally represent operations and water demands for project participants as they are anticipated to be in 2070, as this is the condition during the 50-year planning and contractual period for AVC at which hydrologic effects are likely to be greatest. Cumulative effects generally represent operations and water demands for all reasonably foreseeable activities in 2070. A summary of the Daily Model variable settings is presented in Table 1 through Table 5.

Existing Conditions

The existing conditions Daily Model run simulates existing hydrologic conditions in the Arkansas River Basin due to existing water supplies, demands, decreed water rights, and operations. Existing conditions were simulated using 1982 to 2009 historical hydrology. This provides a basis of comparison for potential AVC and Master Contract Alternative effects for many of the EIS resource studies. Existing conditions differ from historical conditions in that existing conditions assume present-day operations on the river, while historical operations on the river have changed throughout the 1982 through 2009 study period. For example, the flow management programs that are in effect today curtail exchanges on the river for every hydrologic year in the existing conditions simulation, where historically, these exchanges were not curtailed prior to the implementation of the flow management programs.

Municipal demands for existing conditions were assumed to be unconstrained 2010 demands for all municipal entities that are explicitly simulated in the model, including AVC participants, Master Contract participants, Colorado Springs, the Pueblo Board of Water Works, and Aurora (exports through Homestake Pipeline). Agricultural demands were assumed to be the same as historical. Agricultural demands are met using native water rights first, Winter Water second, and Fry-Ark water third. Operations and allocation of water in the Fry-Ark Project are consistent with current practices.

Because existing conditions includes contracts with Reclamation for If/When excess capacity storage in Pueblo Reservoir, existing conditions operations include restrictions on exchanges during times when Reclamation is making releases for purposes of the Upper Arkansas Voluntary Flow Management Program. Currently, limitations on exchanges to the Upper Arkansas River Basin only apply to exchanges made from Pueblo Reservoir. However, the model restricts all exchanges, regardless of the source of replacement water. Additionally, it is assumed that existing conditions operations are consistent with the full Pueblo Flow Management Program.

Table 1. Summary of Daily Model Variable Settings – Fry-Ark Project.

Model Variable	Model Run		
	Existing Condition	**Direct Effects**	**Cumulative Effects**
Fry-Ark Project Settings			
Allocations [1]			
West of Pueblo	4%	4.3%	4.3%
Pueblo	10%	10.0%	10.0%
East of Pueblo	14%	14.5%	14.5%
Fountain Valley Authority	25%	25.4%	25.4%
Unallocated/Agriculture	47%	45.8%	45.8%
Carryover Storage			
West of Pueblo	7,869	13,237	13,237
Pueblo	18,494	18,494	31,200
East of Pueblo	20,347	44,236 [2]	45,254 [2]
Fountain Valley Authority	74,313	75,768	79,404
Unallocated/Agriculture	277,323	246,611	229,251
Fry-Ark Demands			
West of Pueblo	Full Access	Full Access	Full Access
Pueblo	Full Access	Full Access	Full Access
East of Pueblo	Full Access	Full Access	Full Access
Fountain Valley Authority	Full Access	Full Access	Full Access
Agriculture	Full Access	Full Access	Full Access

Notes:
(1) Allocations include allocation of Not Previously Allocated Non-Irrigation Water to East of Pueblo entities.
(2) Use of carryover storage limited to 2 years of AVC demands for the Pueblo Dam-South Alternative.

Table 2. Summary of Daily Model Variable Settings – AVC Participant Demands.

AVC Group	Total Annual Demand (ac-ft)	Surface Water Demand		Groundwater Demand	
		AVC Demand (ac-ft)	River Diversion (ac-ft)	Alluvial Wells Demand (ac-ft)	Deep Wells Demand (ac-ft)
Existing Conditions					
Pueblo County	1,886	0	1,460	426	0
Otero County - Fowler Regionalization Unit	248	0	0	210	38
Otero County - Rocky Ford Regionalization Unit	1,009	0	0	900	109
Otero County - La Junta Regionalization Unit	2,225	0	0	2,068	157
Otero County	319	0	0	29	290
Crowley County	1,032	0	0	907	125
Bent County	658	0	0	570	88
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,834	0	0	2,579	255
Kiowa County	250	0	0	250	0
Total	**10,461**	**0**	**1,460**	**7,939**	**1,062**
No Action Alternative					
Pueblo County	3,001	0	2,451	549	0
Otero County - Fowler Regionalization Unit	262	0	0	262	0
Otero County - Rocky Ford Regionalization Unit	1,166	0	0	1,167	0
Otero County - La Junta Regionalization Unit	2,652	0	0	2,652	0
Otero County	361	0	0	40	322
Crowley County	1,571	0	0	1,206	366
Bent County	704	0	0	602	103
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,620	0	0	2,157	463
Kiowa County	232	0	0	232	0
Total	**12,569**	**0**	**2,451**	**8,867**	**1,253**
Action Alternatives					
Pueblo County	3,000	2,909	0	91	0
Otero County - Fowler Regionalization Unit	262	259	0	2	0
Otero County - Rocky Ford Regionalization Unit	1,166	686	0	465	15
Otero County - La Junta Regionalization Unit	2,652	2,503	0	122	27
Otero County	361	351	0	0	11
Crowley County	1,571	1,247	0	281	0
Bent County	705	694	0	0	11
Prowers County - Lamar Regionalization Unit (plus Wiley)	2,620	1,491	0	1,270	213
Kiowa County	232	116	0	116	0
Total	**12,569**	**10,256**	**0**	**2,347**	**277**

Table 3. Summary of Daily Model Variable Settings – AVC and Master Contract Participants.

Model Variable	Model Run		
	Existing Condition	Direct Effects	Cumulative Effects
AVC Settings			
AVC Diversion Location (1)	None	Varies	Varies
AVC Participant Settings			
Demands	2010	2070	2070
Master Contract in Pueblo Res. (1)	None	Varies	Varies
If/When Excess Capacity in Pueblo Res. (1)	500 acre-feet	Varies	Varies
FVA Participant Settings (Master Contract)			
Demands	2010	2060	2060
FVA Deliveries	Existing	Full Capacity	Full Capacity
SDS Excess Capacity in Pueblo Res.	600 ac-ft	600 ac-ft	4,000 ac-ft
Master Contract Excess Capacity (2) (3)	None	Varies	Varies
ROY Storage in Holbrook	Yes	Yes	Yes
Fountain WWTF	FSD	FSD	FSD, Future WWTF
Security WWTF	SWSD	SWSD	SWSD
Pueblo West Settings (Master Contract)			
Demands	2010	2060	2060
SDS Excess Capacity in Pueblo Res.	9,000 ac-ft	9,000 ac-ft	10,000 ac-ft
Master Contract Excess Capacity (3)	None	Varies	Varies
ROY Storage in Holbrook	No	No	No
WWTF Discharge	Wild Horse Creek	Wild Horse Creek	Wild Horse Creek Pipeline
LAVWCD Settings (Master Contract)			
Demands	None	None	None
If/When Excess Capacity in Pueblo Res. (3)	2,500 ac-ft	Varies	Varies
Master Contract Excess Capacity (3)	None	Varies	Varies
Super Ditch	No	Yes	Yes
LAVWCD water rights	Yes	Yes	Yes
Other Master Contract Participants (4)			
Demands	2010	2060	2060
If/When Excess Capacity in Pueblo Res. (3)	1,625 ac-ft	Varies	Varies
Master Contract Excess Capacity (3)	None	Varies	Varies

Notes:

AVC – Arkansas Valley Conduit
FVA – Fountain Valley Authority
SDS – Southern Delivery System
ROY – Restoration of Yield
WWTF – Waste Water Treatment Facility
FSD – Fountain Sanitation District
SWSD – Security Water and Sanitation District
LAVWCD – Lower Arkansas Valley Water Conservancy District

(1) Selection of component settings varies based upon the Alternative selected.
(2) Includes Stratmoor Hills
(3) Selection of component settings varies based upon the Alternative selected.
(4) Includes Poncha Springs, Salida, Upper Arkansas Water Conservancy District, Cañon City, Florence, and Penrose

Table 4. Summary of Daily Model Variable Settings – Non-AVC/Master Contract Participants.

Model Variable	Existing Condition	Direct Effects	Cumulative Effects
Colorado Springs Settings			
Demands	2010	2010	2070
FVA Deliveries	Existing	Existing	Full Capacity
Southern Delivery System	No	No	Yes
Excess Capacity in Pueblo Res.	17,000 ac-ft	17,000 ac-ft	28,000 ac-ft
Reclamation Contract Exchanges	10,000 ac-ft	10,000 ac-ft	10,000 ac-ft
Transmountain Diversions	Potential	Potential	Potential
Demands at Otero Pump Station	Existing	Existing	Full Capacity
Highline Lease	No	No	No
ROY Storage in Holbrook	Yes	Yes	Yes
WWTF	LVWWTF, J.D. Phillips WRF	LVWWTF, J.D. Phillips WRF	LVWWTF, J.D. Phillips WRF
Aurora Settings			
Excess Capacity in Pueblo Res.	10,000 ac-ft	10,000 ac-ft	10,000 ac-ft
Reclamation Contract Exchanges	10,000 ac-ft	10,000 ac-ft	10,000 ac-ft
Upper Arkansas Ranch water rights	Yes	Yes	Yes
Rocky Ford I Transfer	Yes	Yes	Yes
Colorado Canal	Yes	Yes	Yes
Rocky Ford II Transfer	Yes	Yes	Yes
Demands at Otero Pump Station	Existing	Existing	Full Capacity
Highline Lease	Yes	Yes	Yes
ROY Storage in Holbrook	Yes	Yes	Yes
Other Settings			
Municipal Demands (1)	2010	2010	2070
Agricultural Demands (2)	Historical	Historical	Historical
BWWP Excess Capacity Storage in Pueblo Reservoir	9,000 ac-ft	9,000 ac-ft	15,000 ac-ft
Pueblo FMP	Yes	Yes	Yes
UAVFMP Restrictions at Wellsville	Yes	Yes	Yes
ROY Storage – Others	Yes	Yes	Yes
Comanche Power Plant	Expanded	Expanded	Expanded
City of Pueblo RICD Decree	Yes	Yes	Yes
Chaffee County RICD Decree (3)	Yes	Yes	Yes
Fountain Creek Basin Gain/Loss Adjustments	Existing (2010)	Existing (2010)	Future (2070)

Notes:
FVA – Fountain Valley Authority
ROY – Restoration of Yield
WWTF – Waste Water Treatment Facility
LVWWTF – Las Vegas Street Wastewater Treatment Facility
J.D. Phillips WRF – J.D. Phillips Water Reclamation Facility
BWWP – Pueblo Board of Water Works
FMP – Flow Management Program
UAVFMP – Upper Arkansas Valley Flow Management Program
RICD – Recreational In-Channel Diversion

(1) Applies only to larger municipal entities (i.e. BWWP) Future Southern Delivery System and Otero Pump Station Demands are at the same level as they were in the Southern Delivery System Environmental Impact Statement.

(2) Agricultural demands assume the same demands as they have historically diverted. Demands for systems that have been substantially converted to municipal use (Colorado Canal and Rocky Ford Ditch) or have substantial municipal leases during some years (High Line Canal) assume agricultural demands that are consistent with their current municipal and agricultural ownership patterns. There are some systems, such as the Bessemer Ditch, where smaller amounts of the system have been changed to municipal use. For these smaller amounts, the Daily Model does not make adjustments based on current ownership. This assumption has minimal effects on the Daily Model simulation results.

(3) Does not affect decreed exchanges or pending exchanges applied for before 2004.

Table 5. Summary of Daily Model Variable Settings – Alternatives.

Model Variable	Alternative						
	No Action	**Comanche South**	**Pueblo Dam South**	**JUP North**	**Pueblo Dam North**	**River South**	**Master Contract Only**
AVC Settings							
AVC Intake Location	N/A	Pueblo Dam	Pueblo Dam	Pueblo Dam	Pueblo Dam	St. Charles Mesa Intake	N/A
Water Treatment Losses	N/A	5%	5%	5%	5%	5%	5%
River AVC Transit Loss	N/A	0%	0%	0%	0%	1.1%	0%
Master Contract Settings							
Master Contract Location	N/A	Pueblo Reservoir	Pueblo Reservoir	N/A	Pueblo Reservoir	Pueblo Reservoir	Pueblo Reservoir
AVC Master Contract	None	8,238 ac-ft	8,238 ac-ft	None	8,238 ac-ft	8,238 ac-ft	8,238
FVA Master Contract (1)	None	3,350 ac-ft	3,350 ac-ft	None	3,350 ac-ft	3,350 ac-ft	3,350 ac-ft
Pueblo West Master Contract	None	6,000 ac-ft	6,000 ac-ft	None	6,000 ac-ft	6,000 ac-ft	6,000 ac-ft
Lower Arkansas Valley Water Conservancy District Master Contract	None	5,000 ac-ft	5,000 ac-ft	None	5,000 ac-ft	5,000 ac-ft	5,000 ac-ft
Other Master Contract	None	7,350 ac-ft	7,350 ac-ft	None	7,350 ac-ft	7,350 ac-ft	7,350 ac-ft
Other Settings							
Interconnect	None	Yes	No	Yes	Yes	No	No
AVC Participant If/When Excess Capacity	500 ac-ft	None	None	500 ac-ft	None	None	None
FVA If/When Excess Capacity (1)(2)	500 ac-ft	None	None	500 ac-ft	None	None	None
Lower Arkansas Valley Water Conservancy District If/When Excess Capacity	2,500 ac-ft	None	None	2,500 ac-ft	None	None	None
Other If/When Excess Capacity (2)	1,625 ac-ft	None	None	1,625 ac-ft	None	None	None
Fry-Ark Project Return Flows Storage	If/When Contracts	Master Contract	Master Contract	If/When Contracts	Master Contract	Master Contract	Master Contract
Use of Fry-Ark Project Water	Augmentation	AVC/Augmentation	AVC/Augmentation	AVC/Augmentation	AVC/Augmentation	AVC/Augmentation	Augmentation
Alluvial Groundwater	~7,000 ac-ft	~1,000 ac-ft	~1,000 ac-ft	~1,000 ac-ft	~1,000 ac-ft	~1,000 ac-ft	~7,000 ac-ft
Non-Tributary Groundwater	~800 ac-ft	~60 ac-ft	~60 ac-ft	~60 ac-ft	~60 ac-ft	~60 ac-ft	~800+ ac-ft

Notes: FVA – Fountain Valley Authority;
N/A – Not Applicable

(1) Includes Stratmoor Hills.

(2) Does not include proposed Southern Delivery System excess capacity storage.

Direct Effects

Direct effects are intended to isolate the future effects of the alternatives. For the direct effects scenario, municipal demands were assumed to be 2070 demands for each of the AVC Project participants, 2060 demands for each of the Master Contract participants, and 2010 demands for other explicitly simulated entities in the basin (i.e., Board of Water Works of Pueblo and Colorado Springs Utilities). The 2070 and 2060 dates for AVC and Master Contract entities were chosen because these dates match the end of expected contracting periods for the AVC and Master Contract, respectively. Demands at the Otero Pump Station for both Colorado Springs Utilities and Aurora were set to historical deliveries since 2002, and regressed annual values (with hydrologic conditions using Salida most probable flow) distributed daily using historical diversions prior to 2002.

For agricultural demands that would not have a municipal component, the agricultural demands were assumed to be the same as historical. For agricultural demands with a municipal component, it was assumed that the municipal portions of these demands would be fully diverted for AVC and Master Contract participants, and existing diversions for other entities. Operations and allocation of water in the Fry-Ark Project are consistent with current practices for municipal entities (except project participants) and agricultural entities. For entities East of Pueblo (which includes nearly all of the AVC participants) it was assumed that Fry-Ark Project allocations would be made and purchased by AVC participants at a rate equal to their yield allocation plus "Not Previously Allocated Non Irrigation Water" supplies (approximately 14 percent of the total Fry-Ark allocation), limited to AVC participants' share of municipal carryover storage. For all alternatives except Pueblo Dam South Alternative, the alternative assumed full use of carryover storage. For the Pueblo Dam South Alternative, carryover storage was limited to 2 years of AVC demands (or approximately 21,000 acre-feet).

Similar to Southern Delivery System EIS modeling, the direct effects analysis also includes potential increases in flow that may occur in the future within the Fountain Creek Basin that are based on a trend analysis of historical flows. Increases in flow are anticipated with an increase in pavement or impervious area within the cities, contributing to greater surface runoff to Fountain Creek in the future. The model is constructed so that the direct effects analysis assumes a proportion of potential increases in flow consistent with the participants' proportion of growth in the Fountain Creek Basin at 2060. The direct effects analysis includes a pro-rated increase in flow along Fountain Creek based on growth in Fountain, Security, Widefield and Stratmoor Hills.

All alternatives include restrictions on exchanges to the Upper Arkansas River Basin reservoirs during times that Reclamation is making releases for purposes of the Upper Arkansas Voluntary Flow Management Program, and the full Pueblo Flow Management Program.

Cumulative Effects

The cumulative effects analysis evaluates the effects of all reasonably foreseeable future activities in the study area. Not all reasonably foreseeable projects listed in Chapter 4 of the EIS are necessarily applicable to the hydrologic modeling. Those that are applicable include actions with changes in municipal and agricultural demands, changes in flow in the Fountain Creek Basin, changes in Fry-Ark operations, and potential effects of climate change (see text below).

For the cumulative effects scenario, municipal demands were assumed to be 2070 demands for all entities within the basin. Future demands for entities other than the participants were obtained from recent planning studies for those entities as discussed in Appendix D.3.

For agricultural demands that would not have a municipal component, the agricultural demands were assumed to be the same as historical. For agricultural demands with a municipal component, the cumulative effects scenario assumed that the municipal portions of these demands would be fully diverted.

Operations and allocation of water in the Fry-Ark Project are consistent with anticipated future practices for the cumulative effects analysis. It was assumed that all entities take full delivery of Fry-Ark Project water and store it in their allocated portion of carryover storage space. Deliveries of Fry-Ark Project water to the Board of Water Works of Pueblo are determined according to their overall demands, water rights priorities and other storage priorities.

Like the direct effects analysis, the cumulative effects scenario also included potential increases in flow that may occur in the future within the Fountain Creek Basin, based on a trend analysis of historical flows. However, the cumulative effects analysis assumes full levels of potential increases in flow throughout the entire study area, including Colorado Springs Utilities.

Operations of the Pueblo Flow Management Program and Upper Arkansas Voluntary Flow Management Program in the cumulative effects analysis are similar to those described in the direct effects analysis.

General Simulation Results

This section presents information on general operations of the AVC and Master Contract alternatives. These data would not necessarily represent effects of the alternatives but are used in subsequent sections of this report to describe how general operations affect streamflow and reservoir contents. The data include data specific to the alternatives, as well as general summary information for other operations within the study period.

AVC Components

AVC components include water supply, regulating storage, intake, conveyance through Pueblo, conveyance East of Pueblo and water treatment. Hydrologic data for water supply, regulating storage, conveyance and the water treatment plant are presented in this section. Because hydrologic data for the intake, conveyance through Pueblo and conveyance East of Pueblo and water treatment are very closely related and nearly the same, these component were combined into a single conveyance section. Water supplies and regulating storage are discussed last in this section because a review of operations for the remaining components is helpful to understanding storage contents in regulating storage.

Conveyance and Water Treatment

The monthly amount of water to be treated at the proposed AVC water treatment plant was developed in AVC Yield Analysis (see Appendix D.2) for each participant grouping, and provided to the Daily Model as a time-series input that varies by month and year. The sum of these demands, plus additional diversions to account for water treatment plant losses, becomes the total flow diverted at the AVC intake and inflow to the AVC water treatment plant. Conveyance through a majority of the AVC pipeline and deliveries to the AVC participants is equal to the inflow of the water treatment plant minus treatment plant losses. In addition to AVC deliveries, non AVC supplies are delivered to some AVC participants that have total 2070 demands greater than AVC deliveries.

The mean annual amount of water delivered through the AVC is presented in Table 6. Annual 2070 demands and deliveries are about 12,570 acre-feet per year. 2070 Pumping demand for Lamar and Kiowa County groups is about 1,290 acre-feet and is not simulated in the model. Only the AVC demand for these two groups is simulated. The total AVC demand and pumping demands for entities upstream of John Martin Reservoir is therefore about 11,280 acre-feet per year. Demands are met for all alternatives during all years. Deliveries for cumulative effects would be nearly identical to total deliveries in the direct effects analysis.

Table 6. Mean Annual AVC Demands and Deliveries (Direct Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Total 2070 AVC Participant Demand(1)	7,377	9,719	11,281	11,281	11,281	11,281	11,281	9,719
Total AVC WTP Inflows (Intake) (2)	0	0	10,640	10,640	10,800	10,800	10,640	0
Total AVC WTP Inflows (DS WTP)	0	0	10,260	10,260	10,260	10,260	10,260	0
Total AVC WTP Losses (2)	0	0	380	380	540	540	380	0
Non-AVC Supplies Delivered (3)	7,350	9,480	1,030	1,030	1,030	1,030	1,030	9,480

Notes:

1) Total demand is 12,570 ac-ft. This table contains simulated demand, as explained in the text.
2) The Comanche South Alternative as modeled includes the AVC water treatment plant downstream of St. Charles Mesa Water Treatment Plant, thus raw water was delivered to St. Charles Mesa Water District. The Comanche South Alternative as reconfigured in the modified Comanche South Alternative (see Appendix B.1) includes the AVC water treatment plant at Pueblo Dam, thus treated water will be delivered to St. Charles Mesa Water District. This will result in water treatment losses similar to the JUP North and Pueblo Dam North alternatives. This increase in water treatment losses for the modified Comanche South Alternative will not have measurable changes in the results of the hydrologic analyses presented herein. Results of the hydrologic analyses for the modified Comanche South Alternative would be most similar to the Pueblo Dam North Alternative.
3) Primarily groundwater pumping

Median monthly deliveries through the AVC are presented in Figure 2. The peak monthly deliver occurs in July at about 16 million gallons per day. Because annual demand through the AVC is met during all years in the model, and is the same for all alternatives, there is little difference in the median monthly delivery through AVC for the alternatives. Differences that do occur are attributable to the different treatment options, where St. Charles Mesa would not incur a loss for a raw water deliver. For those participants for whom AVC delivers all of their future supplies, annual flows through AVC match a typical municipal demand curve that peaks during the summer months and is lower during the winter months. For AVC participants that will continue to use non-AVC sources, deliveries through AVC can either be proportional to the total daily demand during the entire year, or vary based on month (i.e. lower proportional deliveries during summer months and higher during winter months). It should be noted that the Daily Model does not simulate peak daily diversions.

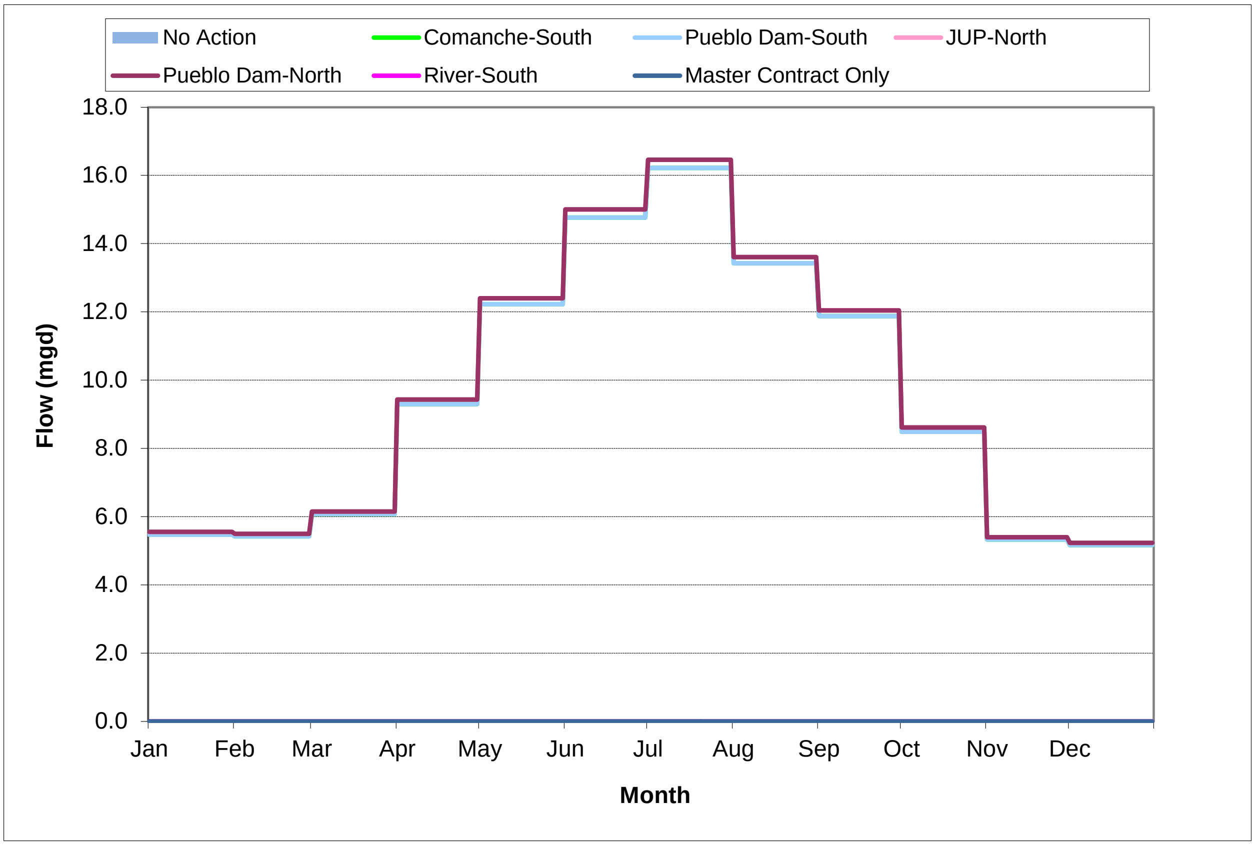

Figure 2. Median Daily Direct Effects Analysis Water Treatment Plant Flows.

AVC Water Supplies

The primary water supplies for the AVC participants include Fry-Ark Project allocations, Project participants' transferred agricultural water rights, Fry-Ark reusable return flows, and leases from the Lower Arkansas Valley Water Conservancy District (Lower Ark). Water owned in Twin Lakes Reservoir would be directly delivered to the Master Contract account by some Crowley County participants. Water owned in the Colorado Canal System and any reusable return flows would be delivered to storage by exchange. Finally, the Pueblo County group meets a portion of their demand through their direct flow rights.

AVC participants meet their demand through the AVC from Master Contract storage using their stored non-project supplies and Fry-Ark return flows first, Fry-Ark allocations second and leases from Lower Ark last. Mean annual water supplies delivered through AVC by water supply type and mean annual water supplies delivered via the Arkansas River to augment pumping for AVC participants are presented for the direct effects analysis in Table 7 and for the cumulative effects analysis in Table 8.

The cumulative effects analysis shows nearly the same total flow from all source waters compared to the direct effects analysis. There is more use of non-project water in the cumulative effects because the larger municipalities simulated 2070 demands (e.g. Colorado Springs, Aurora, BWWP) draw down Pueblo Reservoir, creating more room and less spill conditions for the AVC Master Contracts. Total effects would be expected to remain the same with respect to climate change.

Table 7. Mean Annual AVC Participant AVC Water Supplies (Direct Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
AVC Water Supplies								
Fry-Ark Allocations	0	0	2,800	2,800	7,350	2,800	2,810	0
Master Contract Supply/Fry-Ark Return Flows	0	0	7,460	7,460	2,910	7,460	7,450	0
LAVWCD Leases	0	0	0	0	0	0	0	0
Total	0	0	10,260	10,260	10,260	10,260	10,260	0
Augmentation Supplies (AVC Participants)								
Fry-Ark Allocations	1,610	1,520	0	0	0	0	0	770
Master Contract Supply/Fry-Ark Return Flows	0	0	0	0	0	0	0	680
LAVWCD Leases	0	0	0	0	0	0	0	0
Total	1,610	1,520	0	0	0	0	0	1,450

Table 8. Mean Annual AVC Participant Water Supplies (Cumulative Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
AVC Water Supplies								
Fry-Ark Allocations	0	0	2,580	2,550	7,100	2,580	2,580	0
Master Contract Supply/Fry-Ark Return Flows	0	0	7,670	7,670	2,920	7,670	7,670	0
LAVWCD Leases	0	0	10	40	240	10	10	0
Total	0	0	10,260	10,260	10,260	10,260	10,260	0
Augmentation Supplies (AVC Participants)								
Fry-Ark Allocations	1,610	1,500	0	0	0	0	0	690
Master Contract Supply/Fry-Ark Return Flows	0	0	0	0	0	0	0	750
LAVWCD Leases	0	0	0	0	0	0	0	0
Total	1,610	1,500	0	0	0	0	0	1,440

Master Contract Participant Water Supplies

The primary water supplies for the Master Contract participants include groundwater, Fry-Ark Project allocations, non-project water and Fry-Ark reusable return flows stored in Master Contract space, leases from the Lower Arkansas Valley Water Conservancy District (Lower Ark, Super Ditch), and direct flow rights. Except for the Fountain Valley Authority entities, the Master Contract participants meet their demand from Pueblo Reservoir using their stored non-project supplies and Fry-Ark return flows first, Fry-Ark allocations second and leases from Lower Ark last. Fountain Valley Authority entities use their Fry-Ark allocations first, Master Contract or If and When/Southern Delivery System excess capacity contracts second and leases from Lower Ark next, and groundwater last.

Salida, Poncha Springs and the Upper Arkansas Water Conservancy District primarily meet demands through groundwater pumping. Thus, they use their Fry-Ark allocations and water stored in Master Contract space for groundwater depletion augmentation purposes. As they also use reusable return flows and other non-project water directly for augmentation purposes. Thus, the supply needed from Fry-Ark and Master Contract accounts is less than their total simulated augmentation demand. Cañon City, Penrose and Florence meet demands through their direct flow rights, Fry-Ark allocations and water stored in Master Contract space. The Fry-Ark allocation for these six entities is simulated as coming from the Upper Basin Fry-Ark reservoirs. Master Contract supplies are utilized through exchanges.

Pueblo West meets its demand with water stored in its “if and when” excess capacity space. In the cumulative effects this space is larger and is referred to as long-term excess capacity space (permitted through the Southern Delivery System EIS). Other supplies for Pueblo West include Master Contract supplies, Twin Lakes shares, “Not Previously Allocated Non Irrigation Water” supplies, reusable return flows accruing to Pueblo Reservoir that are not stored in either Pueblo account, direct flow rights (including Wheel Ranch and Hill Ranch), and emergency groundwater pumping.

The Fountain Creek entities (Fountain, Security, Widefield, and Stratmoor Hills) all meet demand by utilizing their Fry-Ark allocations, Master Contract supplies, and leases from Lower Ark (Super Ditch) through the Fountain Valley Authority pipeline. A portion of their supply can also include groundwater pumping. Fountain and Security also have supply from their “if and when” excess capacity account (Southern Delivery System long-term excess capacity account) and some Twin Lakes shares from which they take delivery through the Fountain Valley Authority pipeline in direct effects and the Southern Delivery System pipeline in cumulative effects.

Mean annual water supplies delivered to the non-AVC Master Contract participants are presented for the direct effects analysis in Table 9 and for the cumulative effects analysis in Table 10.

Table 9. Water Supplies for Non-AVC Master Contract Entities (Direct Effects).

Entity	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Salida								
Augmentation from Fry-Ark	70	230	240	240	230	240	240	240
Augmentation from Master Contract	330	570	570	570	580	570	570	570
Sub-Total	400	800	810	810	810	810	810	810
Poncha Springs								
Augmentation from Fry-Ark	60	110	30	30	120	30	30	30
Augmentation from Master Contract	0	0	100	100	0	100	100	100
Sub-Total	60	110	130	130	120	130	130	130
Upper Arkansas Water Conservancy District								
Augmentation from Fry-Ark	80	190	210	210	190	210	200	200
Augmentation from Master Contract	130	140	140	140	140	140	140	140
Sub-Total	210	330	350	350	330	350	340	340
Cañon City Water Works								
Fry-Ark Allocations	80	180	270	270	190	270	260	260
Master Contract Supply	0	0	0	0	0	0	0	0
Direct Flow Rights	5,520	10,870	10,810	10,810	10,880	10,810	10,810	10,820
Sub-Total	5,600	11,050	11,080	11,080	11,070	11,080	11,070	11,080
Penrose								
Fry-Ark Allocations	0	910	40	40	960	40	40	50
Master Contract Supply	0	0	1,030	1,030	0	1,030	1,030	1,030
Direct Flow Rights	510	600	600	600	600	600	600	600
Sub-Total	510	1,510	1,670	1,670	1,560	1,670	1,670	1,680
Florence								
Fry-Ark Allocations	330	1,170	1,260	1,260	1,220	1,260	1,260	1,250
Master Contract Supply	0	0	100	100	0	100	100	100
Direct Flow Rights	1,120	1,630	1,620	1,620	1,630	1,620	1,620	1,620
Sub-Total	1,450	2,800	2,980	2,980	2,850	2,980	2,980	2,970
Pueblo West								
If/When - SDS Excess Capacity Supply	4,630	5,170	5,570	5,590	5,160	5,580	5,580	5,600
Master Contract Supply	0	0	410	400	0	400	420	390
Reusable Return Flows (not stored)	430	620	620	620	620	620	620	620
Direct Flow Rights	1,340	1,630	1,660	1,660	1,630	1,660	1,660	1,660
Twin Lakes Shares	480	2,580	1,740	1,740	2,590	1,750	1,720	1,730
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	6,880	10,000	10,000	10,010	10,000	10,010	10,000	10,000
Fountain								
Fry-Ark Allocations	2,760	7,990	6,820	6,850	8,330	6,820	6,790	6,720
If/When - SDS Excess	1,610	1,220	650	650	1,220	650	650	640

Entity	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Capacity Supply								
Master Contract Supply	0	0	3,200	3,180	0	3,200	3,200	3,230
LAVWCD Leases	0	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Direct Flow Rights	0	240	240	240	240	240	240	240
Twin Lakes Shares	0	0	0	0	0	0	0	0
Groundwater	0	1,720	260	240	1,370	260	300	340
Sub-Total	4,370	13,170	13,170	13,160	13,160	13,170	13,180	13,170
Security								
Fry-Ark Allocations	2,670	2,410	2,270	2,280	2,510	2,260	2,250	2,220
If/When - SDS Excess Capacity Supply	890	880	830	840	910	830	820	810
Master Contract Supply	0	0	610	610	0	620	620	620
LAVWCD Leases	100	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Twin Lakes Shares	0	0	0	0	0	0	0	0
Groundwater	0	650	220	200	520	220	240	280
Sub-Total	3,660	4,940	4,930	4,930	4,940	4,930	4,930	4,930
Widefield								
Fry-Ark Allocations	2,490	4,000	4,520	4,540	4,200	4,520	4,500	4,410
Master Contract Supply	0	690	360	340	560	360	380	460
LAVWCD Leases	0	280	80	80	200	80	80	100
Direct Flow Rights	0	240	240	240	240	240	240	240
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	2,490	5,210	5,200	5,200	5,200	5,200	5,200	5,210
Stratmoor Hills								
Fry-Ark Allocations	640	610	690	690	640	680	680	670
Master Contract Supply	0	90	60	50	70	60	60	70
LAVWCD Leases	0	60	10	10	40	10	10	20
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	640	760	760	750	750	750	750	760
Total	26,940	51,960	52,360	52,350	52,070	52,360	52,340	52,360

Table 10. Water Supplies for Non-AVC Master Contract Entities (Cumulative Effects).

Entity	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Salida								
Augmentation from Fry-Ark	70	160	190	180	150	180	190	210
Augmentation from Master Contract	330	620	610	620	630	620	620	600
Sub-Total	400	780	800	800	780	800	810	810
Poncha Springs								
Augmentation from Fry-Ark	60	100	20	20	100	20	20	20
Augmentation from Master Contract	0	0	110	110	0	110	110	110
Sub-Total	60	100	130	130	100	130	130	130
Upper Arkansas Water Conservancy District								
Augmentation from Fry-Ark	80	160	190	180	150	180	190	180
Augmentation from Master Contract	130	160	150	150	160	150	150	150
Sub-Total	210	320	340	330	310	330	340	330
Cañon City Water Works								
Fry-Ark Allocations	80	290	500	510	290	500	510	470
Master Contract Supply	0	0	60	60	0	60	70	60
Direct Flow Rights	5,520	10,630	10,520	10,510	10,630	10,510	10,500	10,550
Sub-Total	5,600	10,920	11,080	11,080	10,920	11,070	11,080	11,080
Penrose								
Fry-Ark Allocations	0	790	20	20	800	20	20	30
Master Contract Supply	0	0	1,050	1,050	0	1,050	1,050	1,050
Direct Flow Rights	510	600	600	610	600	600	610	600
Sub-Total	510	1,390	1,670	1,680	1,400	1,670	1,680	1,680
Florence								
Fry-Ark Allocations	330	1,050	1,200	1,190	1,070	1,200	1,200	1,190
Master Contract Supply	0	0	100	100	0	100	100	100
Direct Flow Rights	1,120	1,590	1,580	1,580	1,600	1,580	1,580	1,590
Sub-Total	1,450	2,640	2,880	2,870	2,670	2,880	2,880	2,880
Pueblo West								
If/When - SDS Excess Capacity Supply	4,630	4,990	5,050	5,080	5,050	5,070	5,000	4,880
Master Contract Supply	0	0	460	450	0	460	470	480
Reusable Return Flows (not stored)	430	620	620	620	620	620	620	620
Direct Flow Rights	1,340	1,610	1,620	1,620	1,610	1,620	1,620	1,630
Twin Lakes Shares	480	2,330	2,070	2,050	2,270	2,050	2,130	2,200
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	6,880	9,550	9,820	9,820	9,550	9,820	9,840	9,810
Fountain								
Fry-Ark Allocations	2,760	5,450	5,000	5,000	5,400	4,980	4,940	4,980
If/When - SDS Excess	1,610	3,080	2,880	2,960	3,110	2,870	3,030	2,720

Entity	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Capacity Supply								
Master Contract Supply	0	0	1,220	1,150	0	1,240	1,080	1,410
LAVWCD Leases	0	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Direct Flow Rights	0	240	240	240	240	240	240	240
Twin Lakes Shares	0	0	0	0	0	0	0	0
Groundwater	0	2,400	1,830	1,820	2,410	1,830	1,870	1,810
Sub-Total	4,370	13,170	13,170	13,170	13,160	13,160	13,160	13,160
Security								
Fry-Ark Allocations	2,670	1,930	1,700	1,720	1,940	1,700	1,690	1,700
If/When - SDS Excess Capacity Supply	890	740	670	670	740	670	660	670
Master Contract Supply	0	0	600	600	0	600	600	600
LAVWCD Leases	100	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Twin Lakes Shares	0	0	0	0	0	0	0	0
Groundwater	0	1,240	960	950	1,230	960	980	960
Sub-Total	3,660	4,910	4,930	4,940	4,910	4,930	4,930	4,930
Widefield								
Fry-Ark Allocations	2,490	3,180	3,310	3,360	3,290	3,310	3,280	3,280
Master Contract Supply	0	1,300	1,330	1,290	1,230	1,330	1,380	1,350
LAVWCD Leases	0	480	320	310	440	320	300	330
Direct Flow Rights	0	240	240	240	240	240	240	240
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	2,490	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Stratmoor Hills								
Fry-Ark Allocations	640	490	500	510	500	500	500	500
Master Contract Supply	0	150	160	160	150	160	160	160
LAVWCD Leases	0	110	90	80	100	90	90	90
Groundwater	0	0	0	0	0	0	0	0
Sub-Total	640	750	750	750	750	750	750	750
Total	26,940	51,010	52,050	52,050	51,030	52,020	52,080	52,040

Master Contract Storage

Master Contract is a long-term excess capacity storage contract that provides both the AVC and Master Contract participants with the ability to store reusable return flows, exchanged consumptive use water, and other water that may be available for each participant. All alternatives except the No Action Alternative and the Joint Use Pipeline North Alternative would include a long-term excess capacity contract, while the No Action Alternative and the Joint Use Pipeline North Alternative would include much smaller short-term "if-when" contracts. Both long-term and short-term excess capacity contracts allow the participants to store non Fry-Ark Project water in Fry-Ark storage space, provided there is space available after storing Fry-Ark Project water.

Table 11 presents a summary of mean storage contents and maximum storage contents for each alternative for the direct effects analysis. The mean storage contents would be typically substantially less than the requested capacity for each entity because regulating storage typically would not serve as long term carryover storage for the participants. Rather, the storage would be used annually to store water during times of higher flow (when exchanges could be made) and to release water for demands during times of lower flow. Releases from storage are demand driven and storage is used almost immediately for many entities, especially under the maximum 2070 demand conditions. Therefore, the maximum simulated storage contents do not necessarily reflect the total requested storage. In interim years (i.e. years before 2070) storage account would be fuller because of lower demands.

Figure 3 shows a time series of total storage in Master Contract space for AVC participants and Figure 4 shows the time series for total storage for non-AVC Master Contract participants. As shown, during wet years participants are able to fill their Master Contract space quickly, but are often subject to spills. In these years, there is more exchange potential and ability to capture non-project supplies in Master Contract space. During dry years, the participants are able to gradually fill their Master Contract space as there is space in Pueblo Reservoir. All other alternatives are the same except for the No Action and Joint Use Pipeline North Alternatives, which show the least amount of storage because the Master Contract is not fully simulated in these alternatives. Rather, temporary if and when storage is simulated, which is less than requested under the Master Contract alternatives.

Table 11. Mean and Maximum Analysis Storage Contents in Master Contract Accounts (Direct Effects).

Location	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
AVC participants	8,238	431	346	2,758	2,751	464	2,752	2,712	2,711
MC participants that are Not AVC participants	21,700	948	2,776	7,319	7,324	2,829	7,317	7,303	7,271
Maximum Storage Contents (ac-ft)									
AVC participants	8,238	504	500	4,747	4,745	500	4,748	4,673	5,335
MC participants that are Not AVC participants	21,700	1,270	3,632	12,773	12,772	3,629	12,777	12,769	12,791

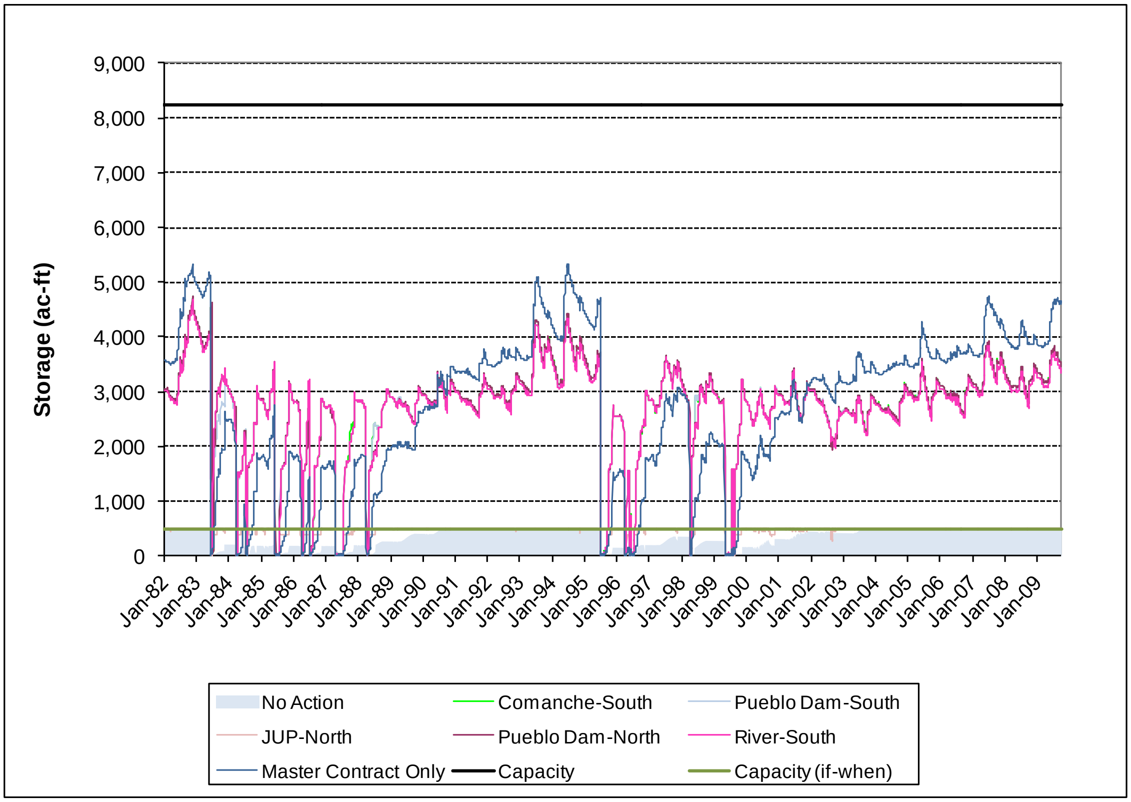

Figure 3. Time-Series of AVC Participants Master Contract Accounts (Direct Effects).

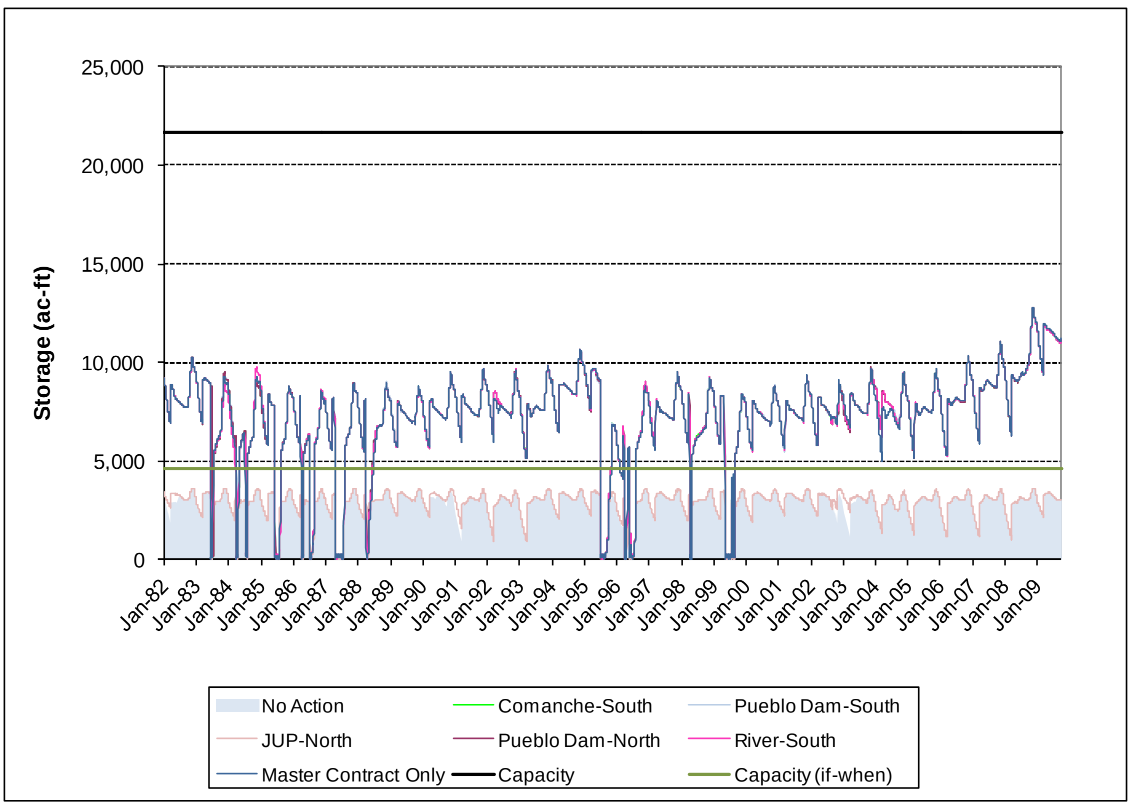

Figure 4. Time-Series of NON-AVC Participants Master Contract Accounts (Direct Effects).

Mean and maximum Master Contract storage contents for the AVC participants is shown in Table 12 and is broken down by participant group. Pueblo County shows storage in non-Master Contract alternatives due to an existing if/when excess capacity account. A breakdown of the simulation results by group is presented after the next table.

Table 12. AVC Master Contract Participant Mean Annual Excess Capacity Storage (Direct Effects).

AVC Master Contract Participant	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
Pueblo County Group	2,000	431	346	1,830	1,823	464	1,824	1,823	783
Fowler Group	97	0	0	0	0	0	0	0	0
Crowley Group	1,900	0	0	503	502	0	503	473	1,246
Rocky Ford Group	1,291	0	0	10	10	0	10	10	11
La Junta Group	2,028	0	0	164	165	0	164	159	198
Otero County Group	272	0	0	45	46	0	45	43	220
Bent County Group	300	0	0	206	206	0	206	204	254
Total AVC Excess Capacity Contract	8,238	431	346	2,758	2,751	464	2,752	2,712	2,711
Maximum Simulated Storage Contents (ac-ft)									
Pueblo County Group	2,000	504	500	2,000	2,000	500	2,000	2,000	1,491
Fowler Group	97	0	0	1	1	0	1	1	0
Crowley Group	1,900	0	0	1,075	1,071	0	1,075	1,004	1,900
Rocky Ford Group	1,291	0	0	172	172	0	172	172	172
La Junta Group	2,028	0	0	1,695	1,720	2	1,705	1,414	1,551
Otero County Group	272	0	0	210	211	0	211	195	272
Bent County Group	300	0	0	300	300	0	300	300	300
Total Maximum AVC Excess Capacity Contract	8,238	504	500	4,747	4,745	500	4,748	4,673	5,335

* Total If and When contract amount = 500 for AVC participants (Pueblo Group) in No Action and JUP - North

Pueblo County AVC Group

The Pueblo County AVC Group has sufficient non-project supplies to both supply demand through exchange and diversion at the AVC intake, and fill Master Contract storage (Figure 5). The group therefore does not often use Master Contract storage, which is typically only depleted during spills in wet periods, or used during dry periods when less exchange potential exists. The No Action and Master Contract Only alternatives show less storage for the Pueblo County AVC Group because St. Charles Mesa's direct flow rights are used directly, rather than stored in the Master Contract. All other alternatives are predominately the same; their time series overlap each other.

Fowler Regionalization AVC Group

The Fowler Regionalization Group supplies exchanged to Pueblo Reservoir are typically used immediately for AVC or augmentation demand, resulting in little to no carryover storage.

Crowley County AVC Group

Crowley County has sufficient non-project supplies to both supply demand through direct diversion at the AVC intake, and partially fill Master Contract storage (Figure 6). The account does not fully fill for most alternatives because of spills in wet years. The Master Contract Only Alternative Master Contract account fills more often, as a larger percentage of the group's demand is met with deep water supplies, rather than with storage. All other alternatives are predominately the same; their time series overlap each other.

Rocky Ford Regionalization AVC Group

The Rocky Ford Regionalization Group supplies exchanged to Pueblo Reservoir are typically used immediately for AVC or augmentation demand, resulting in little to no carryover storage.

La Junta Regionalization AVC Group

The La Junta Regionalization Group supplies exchanged to Pueblo Reservoir are typically used immediately for AVC or augmentation demand, resulting in little carryover storage (Figure 7). The exceptions occur during periods when the Holbrook Canal has large diversions, resulting in abundant non-project supplies for the La Junta Group. All alternatives are predominately the same; their time series overlap each other.

Otero County AVC Group

The Otero County AVC Group uses less of its Master Contract space similar to the Crowley County Group (Figure 8).

Bent County AVC Group

The Bent County AVC Group size and use of Master Contract excess capacity storage is similar to the Otero County AVC Group (Figure 9). The Bent County Group has more supplies, however, and they are able to fill their account more often.

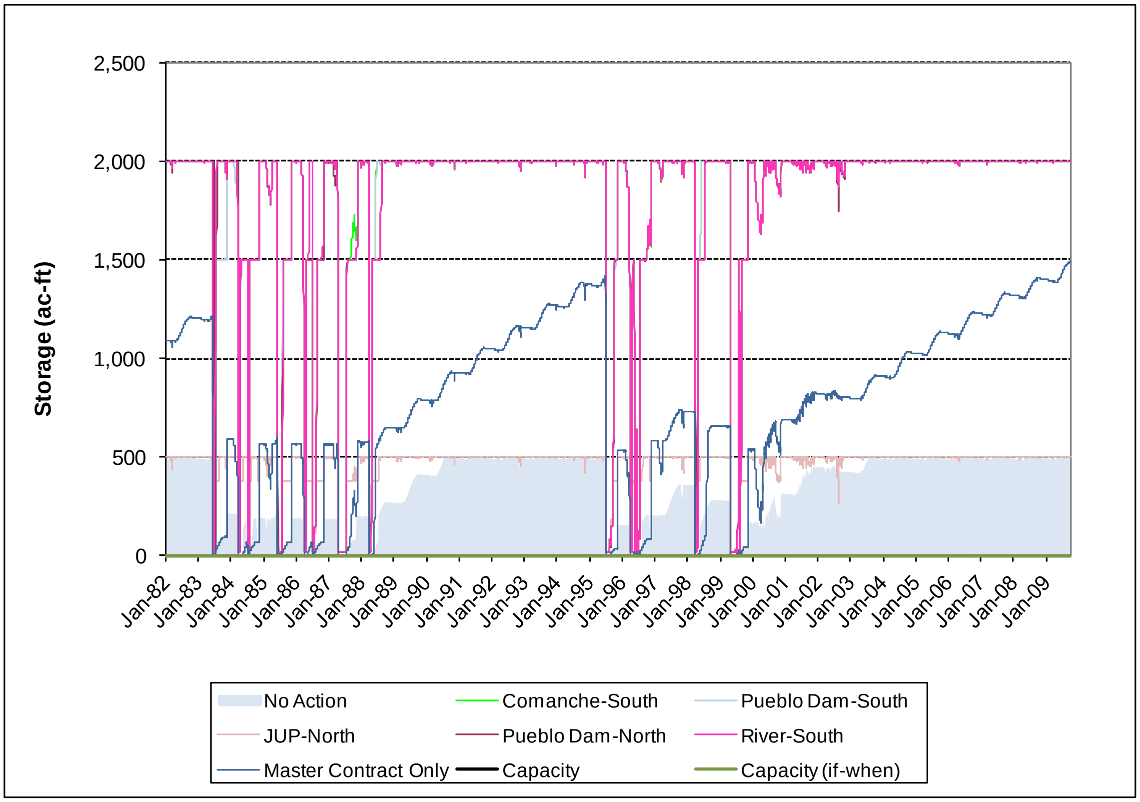

Figure 5. Time Series Storage for AVC – Pueblo County Group Master Contract (Direct Effects).

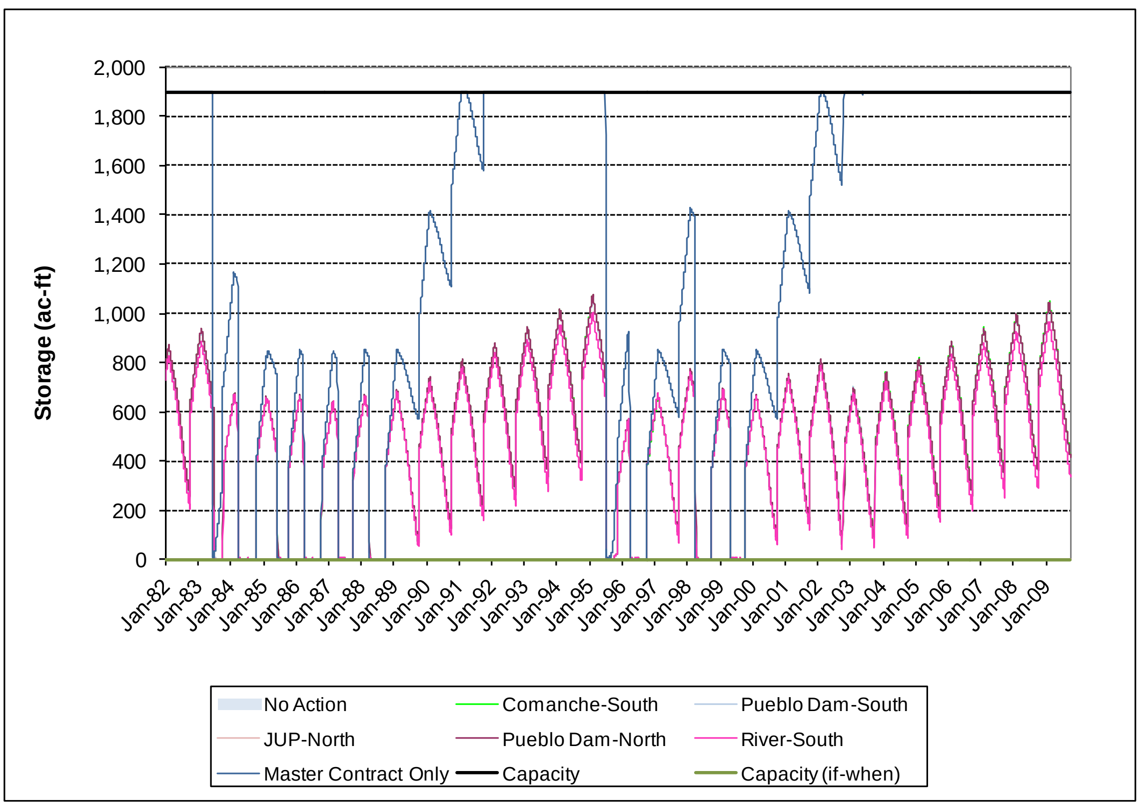

Figure 6. Time Series Storage for AVC – Crowley County Group Master Contract (Direct Effects).

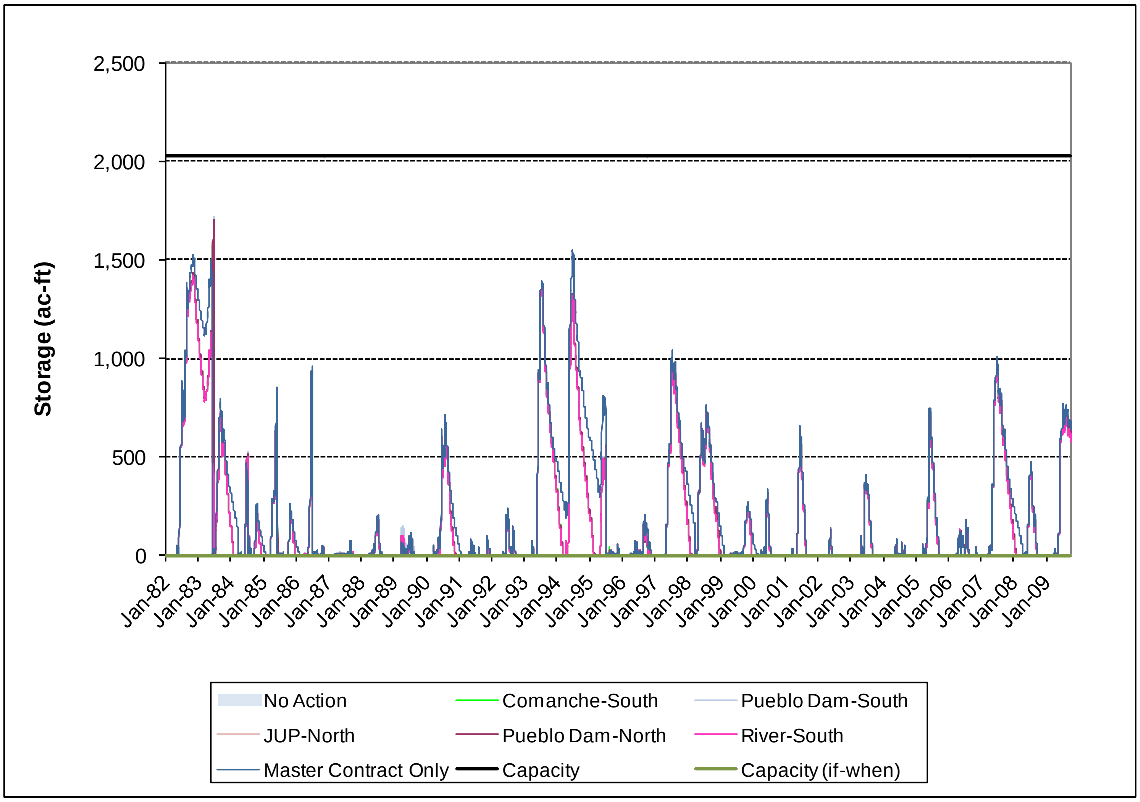

Figure 7. Time Series Storage for AVC – La Junta Regionalization Group Master Contract (Direct Effects).

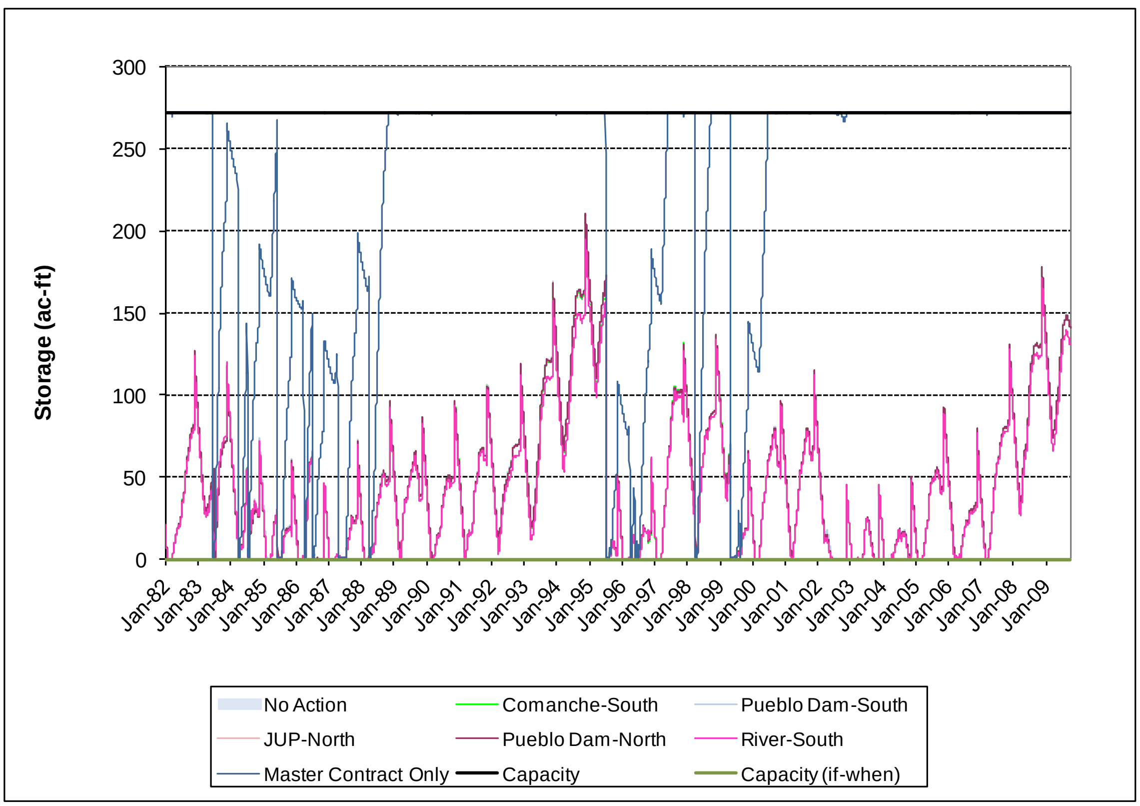

Figure 8. Time Series Storage for AVC – Otero County Group Master Contract (Direct Effects).

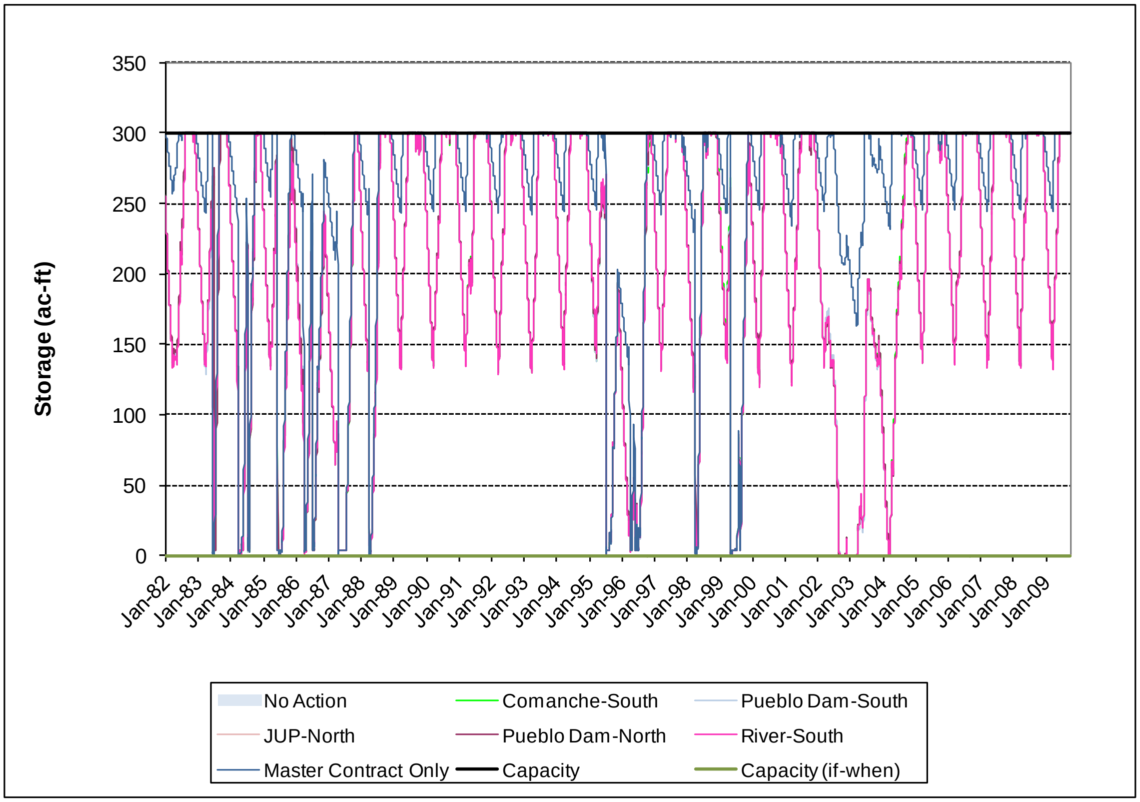

Figure 9. Time Series Storage for AVC – Bent County Group Master Contract (Direct Effects).

Master Contract storage for the non-AVC participants is shown in Table 13. Similar to the AVC participants, supplies are utilized almost immediately for most participants for the 2060 demand scenario.

Table 13. Non-AVC Master Contract Participant Mean Annual Excess Capacity Storage (Direct Effects).

Non-AVC Master Contract Participant	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
Salida	2,000	431	225	220	220	228	220	219	220
Poncha Springs	200	0	0	83	83	0	83	83	83
Upper Arkansas Water Conservancy District	1,000	62	43	40	40	43	39	40	40
Cañon City	1,000	0	0	870	869	0	870	868	863
Florence	2,250	0	0	16	16	0	16	16	16
Penrose	900	0	0	470	469	0	470	470	469
Pueblo West	6,000	0	0	534	536	0	534	530	537
Stratmoor Hills	200	88	66	140	141	72	140	139	134
Widefield	650	367	301	542	543	320	542	541	526
Fountain	1,000	0	0	57	57	0	57	57	57
Security	1,500	0	0	0	0	0	0	0	0
Lower Arkansas Valley Water Conservancy Dist.	5,000	0	2,141	4,346	4,348	2,165	4,345	4,340	4,325
Total Master Contract	21,700	948	2,776	7,319	7,324	2,829	7,317	7,303	7,271
Maximum Simulated Storage Contents (ac-ft)									
Salida	2,000	625	489	489	489	489	489	489	489
Poncha Springs	200	0	0	200	200	0	200	200	200
Upper Arkansas Water Conservancy District	1,000	156	162	130	130	161	130	130	130
Cañon City	1,000	0	0	1,000	1,000	0	1,000	1,000	1,000
Florence	2,250	0	0	250	250	0	250	250	261
Penrose	900	0	0	900	900	0	900	900	900
Pueblo West	6,000	0	0	3,577	3,575	0	3,580	3,573	3,636
Stratmoor Hills	200	100	100	200	200	100	200	200	200
Widefield	650	400	400	650	650	400	650	650	650
Fountain	1,000	0	0	816	845	0	816	799	793
Security	1,500	0	0	23	23	0	23	23	23
Lower Arkansas Valley Water Conservancy Dist.	5,000	9	2,500	5,000	5,000	2,500	5,000	5,000	5,000
Total Master Contract	21,700	1,270	3,632	12,773	12,772	3,629	12,777	12,769	12,791

* Total If and When contract amount = 3,625 for AVC participants in No Action and JUP - North

Salida

Salida may not have sufficient supplies to fill their Master Contract, and also heavily uses their storage for augmentation resulting in little mean storage in their account (Figure 10). Differences in the Joint Use Pipeline North Alternative are caused by AVC participants utilizing their Fry-Ark allocation more in the Joint Use Pipeline North Alternative since they have no Master Contract supply. This creates more excess capacity in Pueblo Reservoir for entities that do have excess capacity accounts in this alternative. All other alternatives are predominately the same; their time series overlap each other.

Poncha Springs

Poncha Springs does not have an excess capacity account in the No Action Alternative or Joint Use Pipeline North Alternative (Figure 11). All alternatives are predominately the same; their time series overlap each other.

Upper Arkansas Water Conservancy District

Upper Ark's excess capacity account is the same size for all alternatives, and is heavily used (Figure 12). All alternatives are predominately the same; their time series overlap each other.

Cañon City

Cañon City typically does not use its Master Contract storage (Figure 13). This is consistent with its use for drought protection. In wet periods the account spills often, as shown in the figure. All alternatives are predominately the same; their time series overlap each other.

Penrose

Penrose's use of their excess capacity account is similar to Poncha Springs (Figure 14).

Florence

Florence's excess capacity account is the same size for all Master Contract alternatives, and is heavily used (Figure 15). This results in small difference between alternatives.

Pueblo West

Pueblo West's excess capacity account is the same size for all Master Contract alternatives, and is heavily used (Figure 16). All alternatives are predominately the same; their time series overlap each other. The large increase in Master Contract storage in the late 2000s is due to an increase in Twin Lakes Reservoir and Canal Company transmountain imports. This increase in imports fills their excess capacity accounts in Twin Lakes, allowing for excess supplies to be delivered to their Pueblo Reservoir accounts.

Stratmoor Hills

Stratmoor Hills has a small Master Contract excess capacity account, which tends to stay full except during times of spill, or during early winter times in drier periods when Fry-Ark carryover storage is low and Master Contract supplies cannot be exchanged from the Fountain Creek confluence (Figure 17). Joint Use Pipeline North has less storage because it has a smaller if/when excess capacity account. All other alternatives are predominately the same; their time series overlap each other.

Widefield

Results of Widefield's Master Contract excess capacity space are similar to those described for Stratmoor Hills (Figure 18).

Security

Security quickly uses any supplies exchanged to its Master Contract excess capacity space, no carry-over storage occurs . This occurs because Security's Southern Delivery System supplies and excess capacity account are not simulated in the direct effects, creating more reliance on their Master Contract space.

Fountain

Fountain quickly uses any supplies exchanged to its Master Contract excess capacity space, similar to Security (Figure 19). All alternatives are predominately the same; their time series overlap each other.

Lower Arkansas Valley Water Conservancy District

Fountain Valley Authority participants (does not include Colorado Springs), AVC participants, and rule 10 and seep ditch demand use Lower Ark District Master Contract storage. Lower Ark District's supplies are abundant, and their account is typically full (Figure 20). Joint Use Pipeline North has less storage because it has a smaller if/when excess capacity account. All other alternatives are predominately the same; their time series overlap each other. The Super Ditch rotational fallowing supplies will continue to be a subject of discussion and refinement in the model.

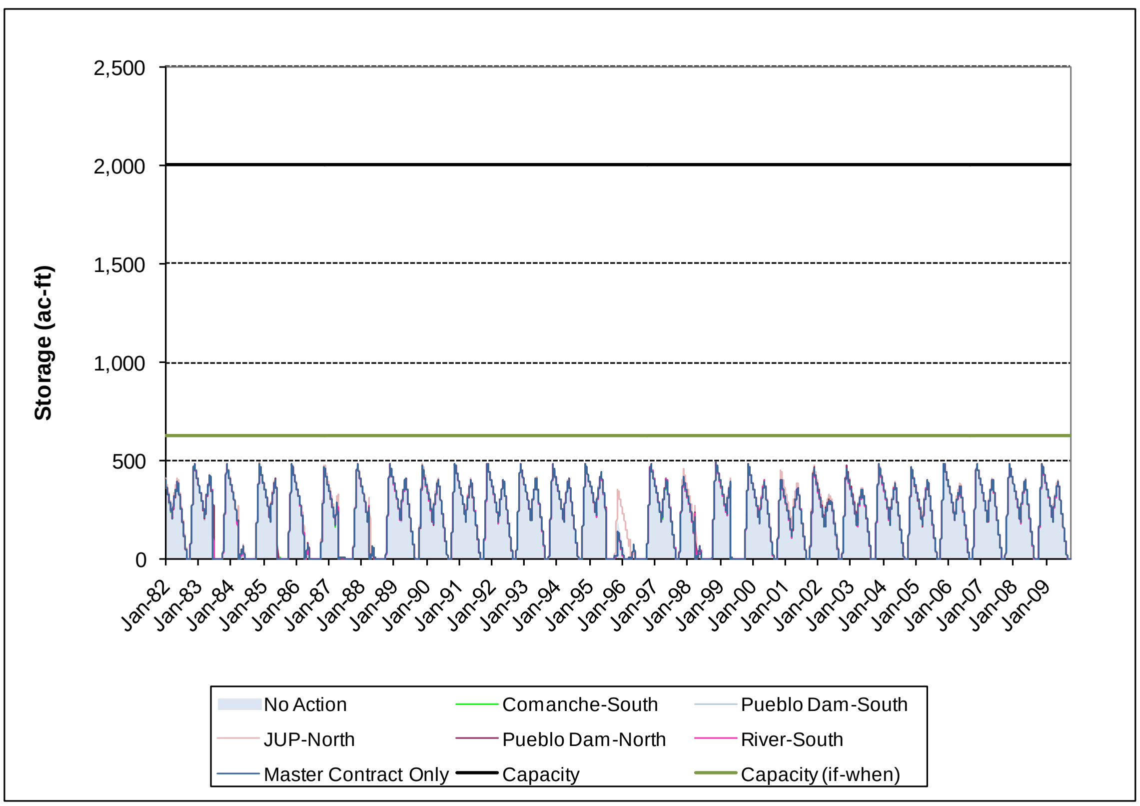

Figure 10. Time Series Storage for Salida Master Contract (Direct Effects).

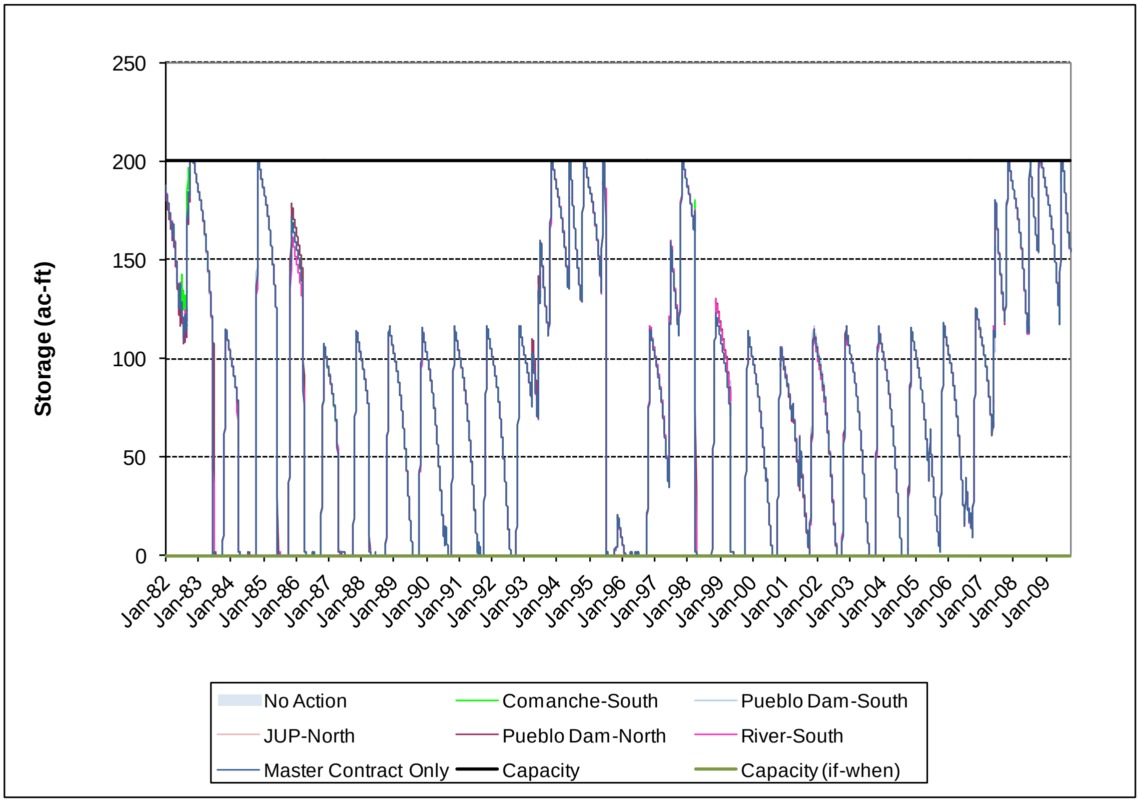

Figure 11. Time Series Storage for Poncha Springs Master Contract (Direct Effects).

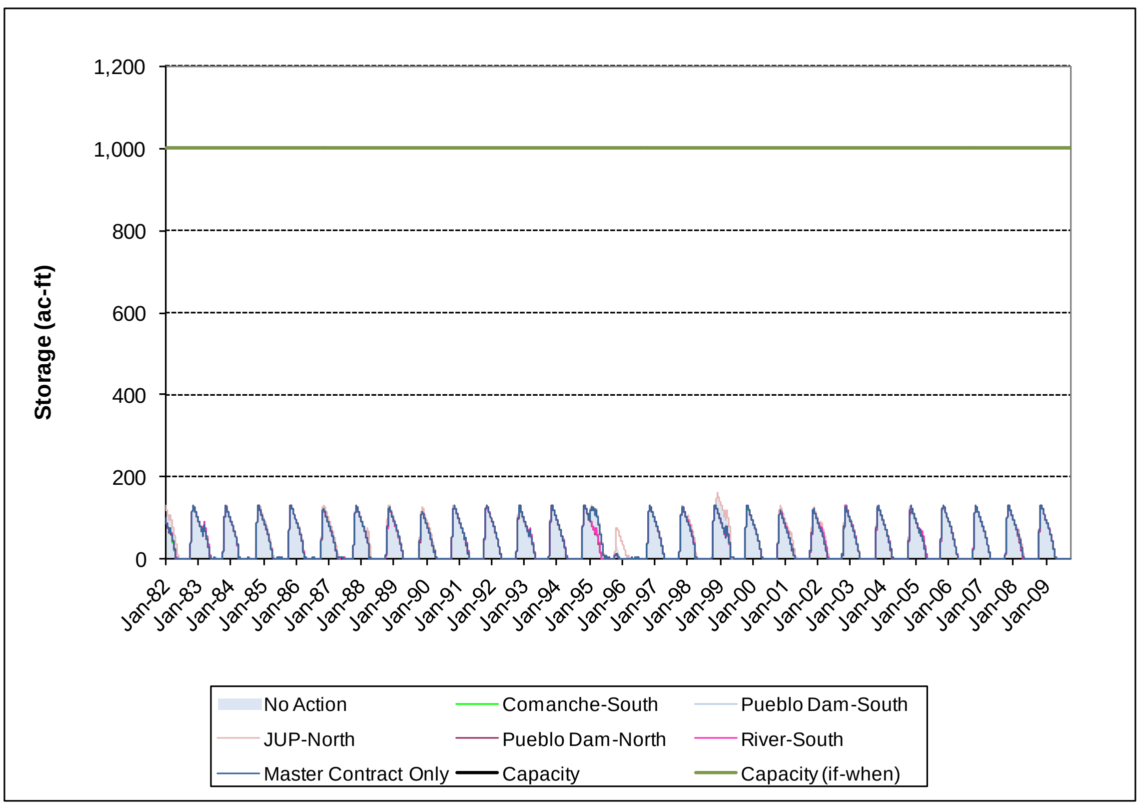

Figure 12. Time Series Storage for Upper Arkansas Water Conservancy District Master Contract (Direct Effects).

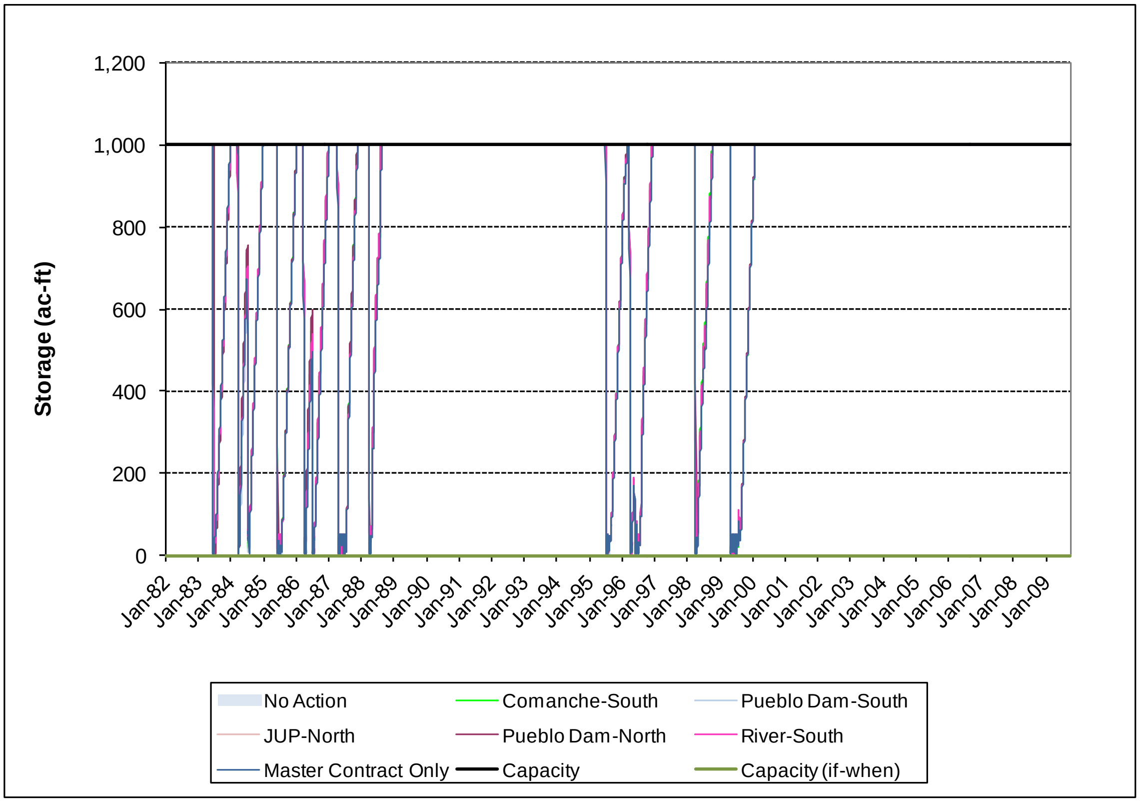

Figure 13. Time Series Storage for Cañon City Master Contract (Direct Effects).

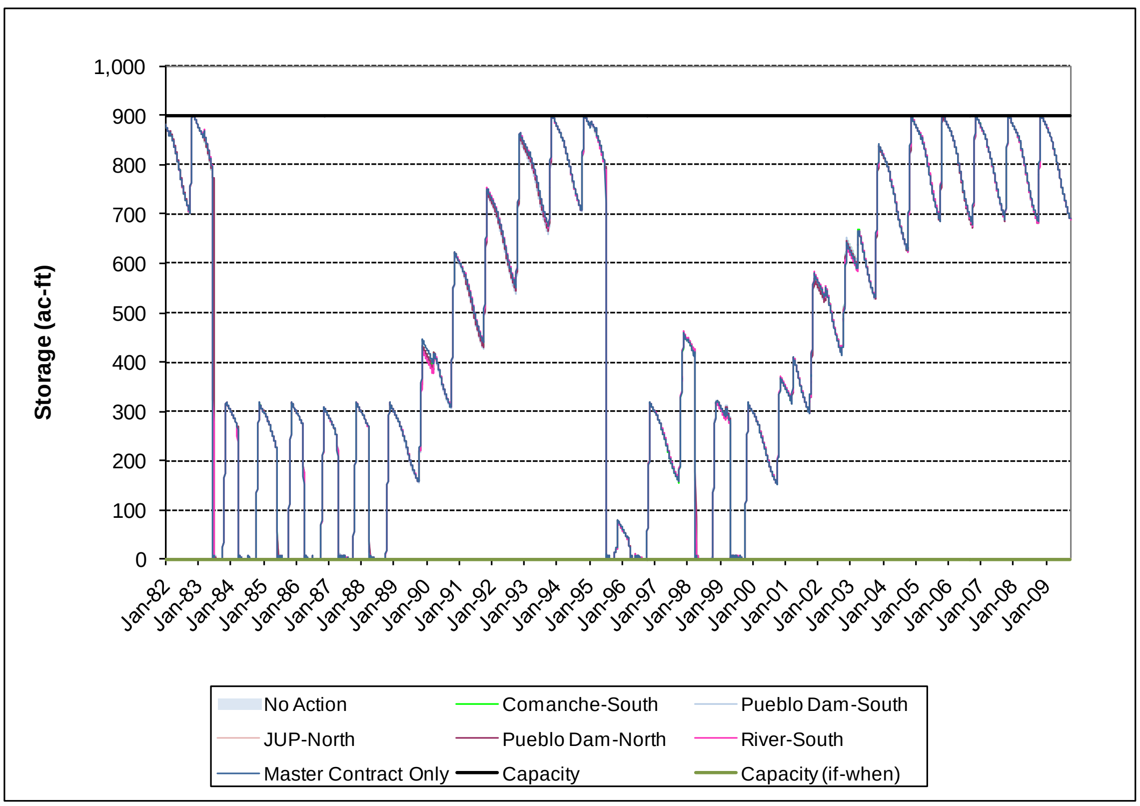

Figure 14. Time Series Storage for Penrose Master Contract (Direct Effects).

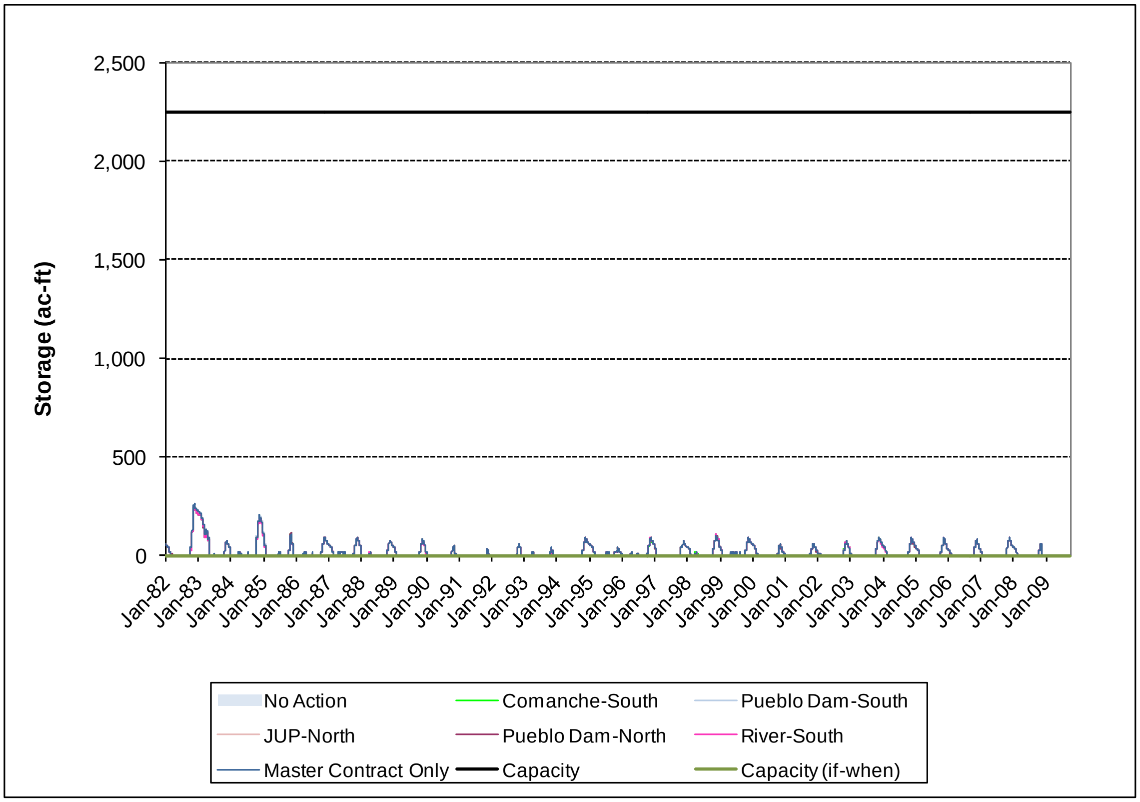

Figure 15. Time Series Storage for Florence Master Contract (Direct Effects).

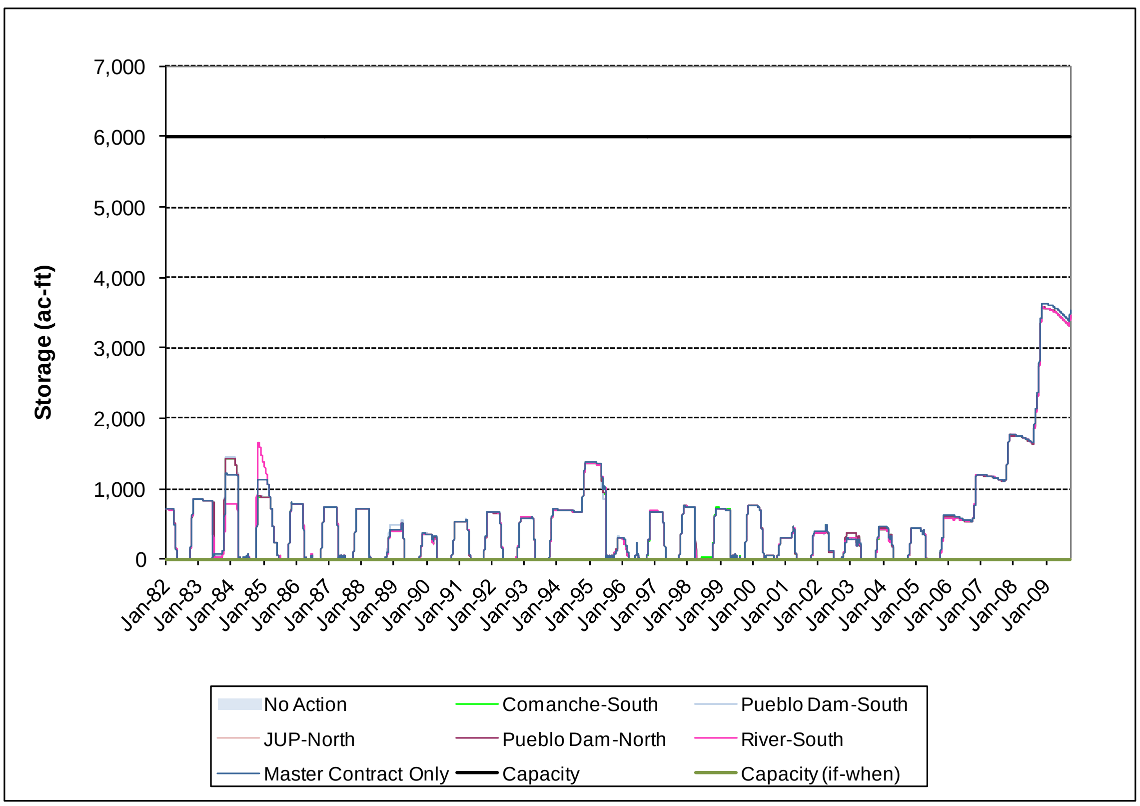

Figure 16. Time Series Storage for Pueblo West Master Contract (Direct Effects).

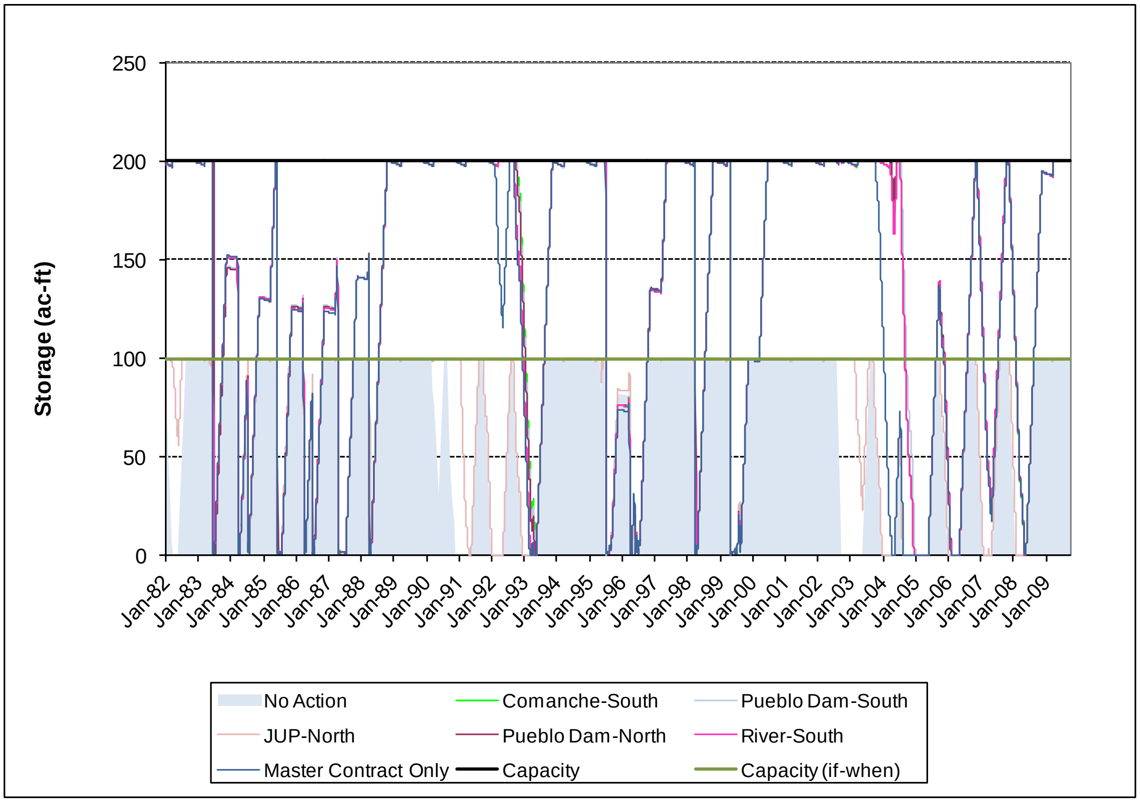

Figure 17. Time Series Storage for Stratmoor Hills Master Contract (Direct Effects).

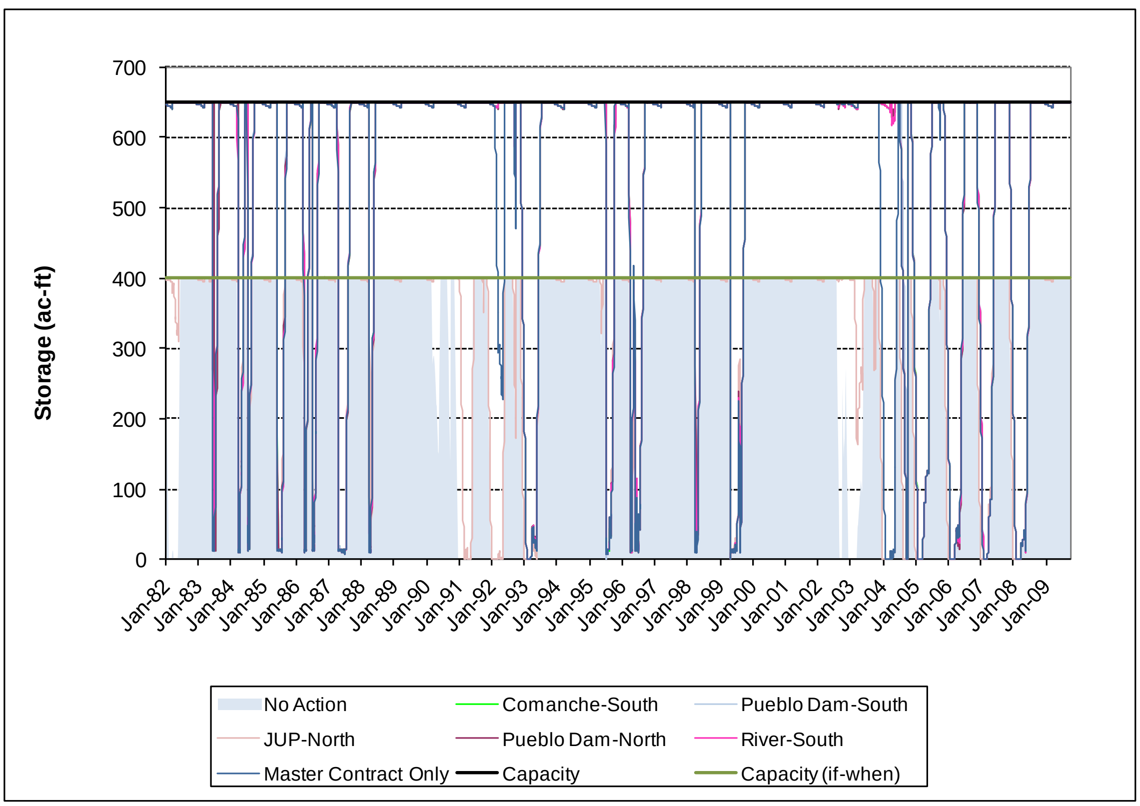

Figure 18. Time Series Storage for Widefield Master Contract (Direct Effects).

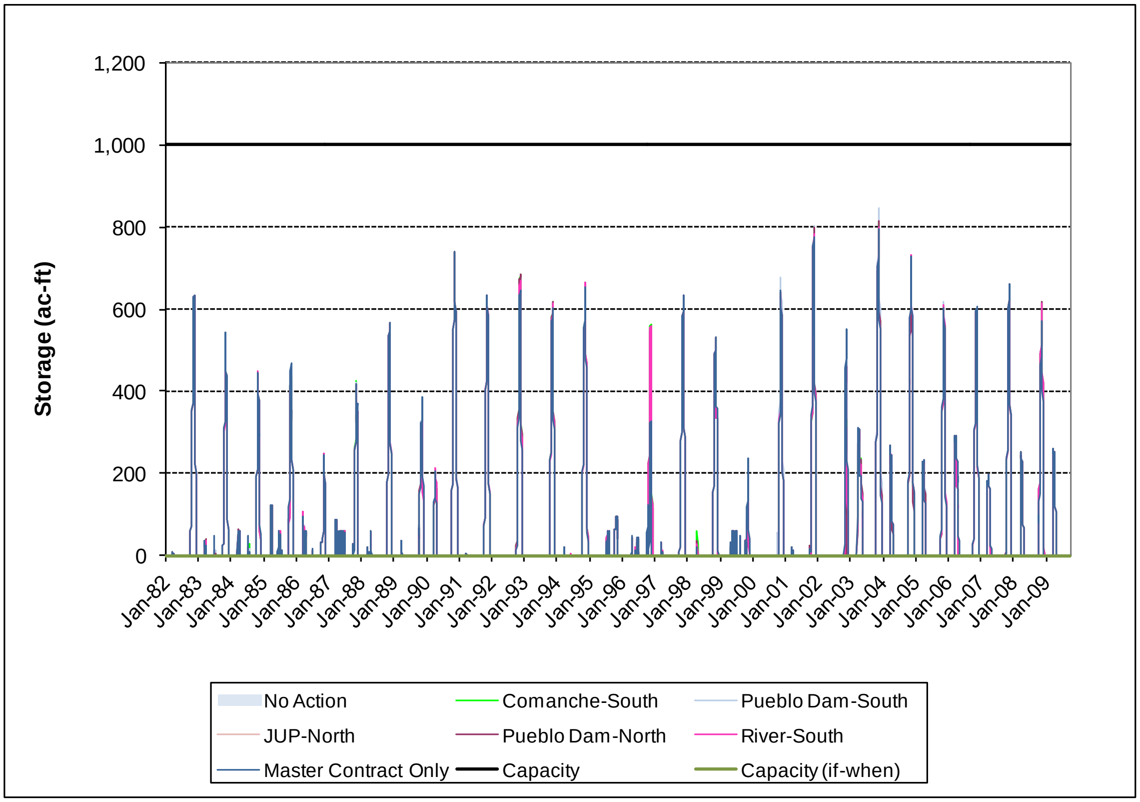

Figure 19. Time Series Storage for Fountain Master Contract (Direct Effects).

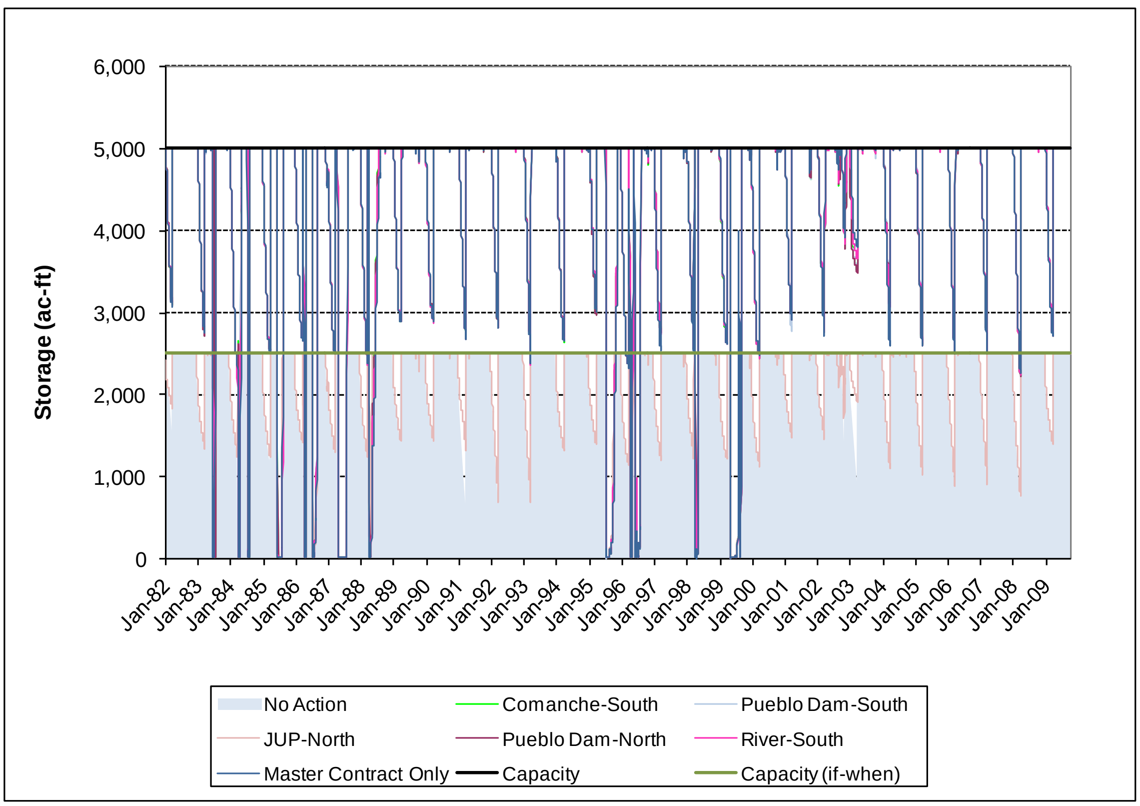

Figure 20. Time Series Storage for Lower-Ark Master Contract (Direct Effects).

Table 14 presents a summary of excess capacity storage for the cumulative effects analysis. The cumulative effects analysis storage contents are generally higher than the direct effects analysis. This is caused by higher use of Pueblo Reservoir storage by the larger municipalities, resulting in more space for participant excess capacity supplies. It is assumed that climate change would result in reduced storage and exchange during summer and fall months and increased storage during winter and spring months.

Table 14. Mean and Maximum Storage Contents in Excess Capacity Accounts (Cumulative Effects).

Location	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
AVC participants	8,238	431	406	3,132	3,143	480	3,141	3,100	3,127
MC participants that are Not AVC participants	21,700	948	2,744	7,535	7,591	2,780	7,567	7,572	7,179
Maximum Storage Contents (ac-ft)									
AVC participants	8,238	504	500	5,264	5,308	500	5,277	5,160	5,910
MC participants that are Not AVC participants	21,700	1,270	3,631	13,303	13,398	3,642	13,300	13,682	12,406

Table 15. AVC Master Contract Participant Mean Annual Excess Capacity Storage (Cumulative Effects).

AVC Master Contract Participant	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
Pueblo County Group	2,000	431	406	1,903	1,903	480	1,905	1,898	886
Fowler Group	97	0	0	0	0	0	0	0	0
Crowley Group	1,900	0	0	581	586	0	585	563	1,369
Rocky Ford Group	1,291	0	0	10	10	0	10	10	11
La Junta Group	2,028	0	0	348	353	0	352	344	359
Otero County Group	272	0	0	68	70	0	69	65	238
Bent County Group	300	0	0	221	221	0	221	220	265
Total AVC Excess Capacity Contract	8,238	431	406	3,132	3,143	480	3,141	3,100	3,127
Maximum Simulated Storage Contents (ac-ft)									
Pueblo County Group	2,000	504	500	2,000	2,000	500	2,000	2,000	1,497
Fowler Group	97	0	0	1	1	0	1	1	0
Crowley Group	1,900	0	0	1,178	1,196	0	1,180	1,114	1,900
Rocky Ford Group	1,291	0	0	172	172	0	172	172	172
La Junta Group	2,028	0	0	2,028	2,028	2	2,028	2,028	2,028
Otero County Group	272	0	0	259	263	0	261	254	272
Bent County Group	300	0	0	300	300	0	300	300	300
Total Maximum AVC Excess Capacity Contract	8,238	504	500	5,264	5,308	500	5,277	5,160	5,910

Table 16. Non-AVC Master Contract Participant Mean Annual Excess Capacity Storage (Cumulative Effects).

Non-AVC Master Contract Participant	Total Requested Contract	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Mean Storage Contents (ac-ft)									
Salida	2,000	431	230	223	226	238	225	222	221
Poncha Springs	200	0	0	95	98	0	97	94	87
Upper Arkansas Water Conservancy District	1,000	62	50	45	45	53	45	44	47
Cañon City	1,000	0	0	939	940	0	940	938	917
Florence	2,250	0	0	14	15	0	14	14	14
Penrose	900	0	0	533	535	0	538	535	495
Pueblo West	6,000	0	0	655	676	0	667	677	414
Stratmoor Hills	200	88	52	94	97	54	94	93	89
Widefield	650	367	259	437	446	271	437	434	424
Fountain	1,000	0	0	7	7	0	8	4	12
Security	1,500	0	0	0	0	0	0	0	0
Lower Arkansas Valley Water Conservancy Dist.	5,000	0	2,153	4,493	4,507	2,164	4,503	4,515	4,460
Total Master Contract	21,700	948	2,744	7,535	7,591	2,780	7,567	7,572	7,179
Maximum Simulated Storage Contents (ac-ft)									
Salida	2,000	625	494	489	489	503	489	489	489
Poncha Springs	200	0	0	200	200	0	200	200	200
Upper Arkansas Water Conservancy District	1,000	156	213	171	172	223	169	163	208
Cañon City	1,000	0	0	1,000	1,000	0	1,000	1,000	1,000
Florence	2,250	0	0	231	237	0	232	239	236
Penrose	900	0	0	900	900	0	900	900	900
Pueblo West	6,000	0	0	4,766	4,806	0	4,763	5,055	3,604
Stratmoor Hills	200	100	100	200	200	100	200	200	200
Widefield	650	400	400	650	650	400	650	650	650
Fountain	1,000	0	0	507	505	0	507	505	522
Security	1,500	0	0	23	23	0	23	23	23
Lower Arkansas Valley Water Conservancy Dist.	5,000	9	2,500	5,000	5,000	2,500	5,000	5,000	5,000
Total Master Contract	21,700	1,270	3,631	13,303	13,398	3,642	13,300	13,682	12,406

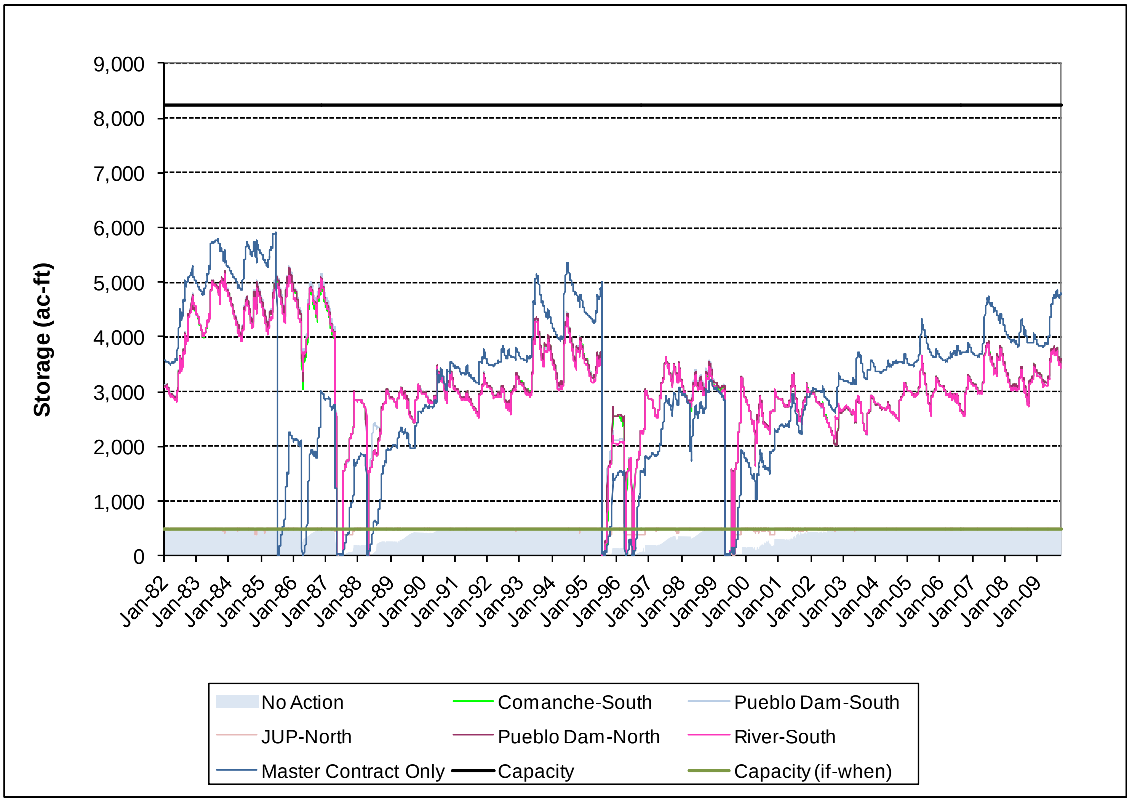

Figure 21. Time-Series of AVC Participants Master Contract Accounts (Cumulative Effects).

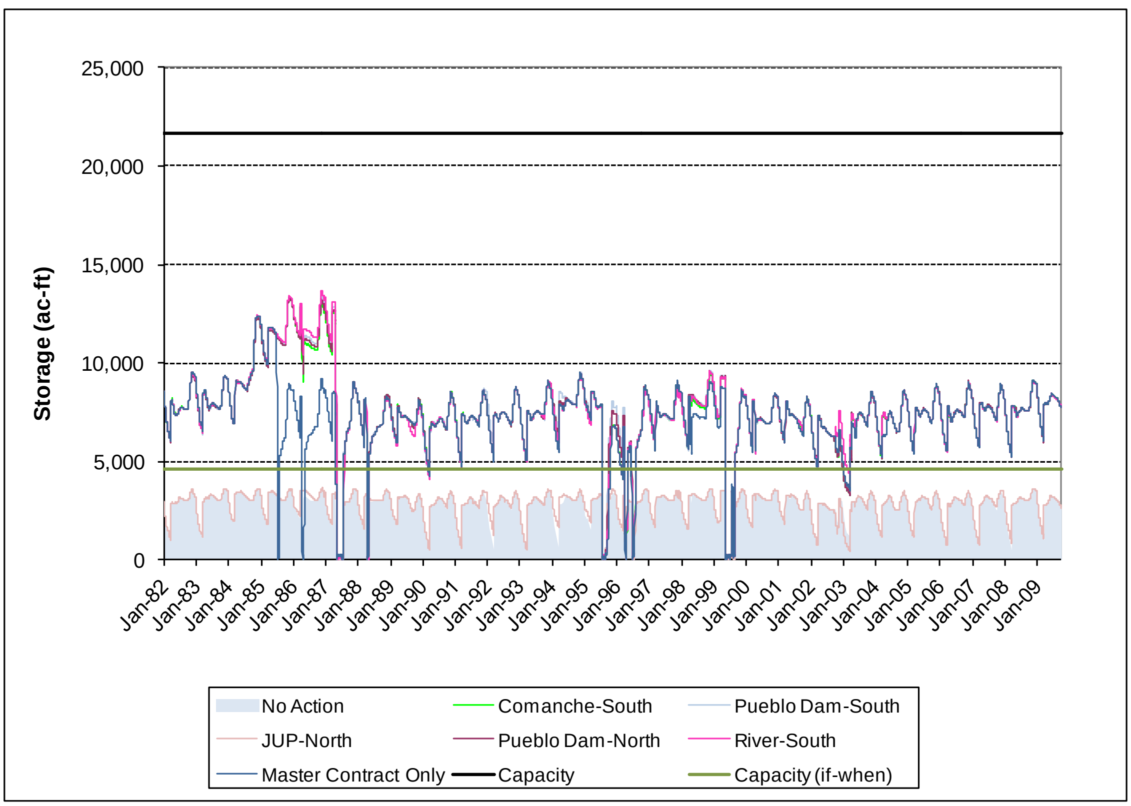

Figure 22. Time-Series of Non-AVC Participants Master Contract Accounts (Cumulative Effects).

Non Fry-Ark Project water stored in excess capacity is subject to spill. The spill priority of this non-Project water is important in simulating storage in Fry-Ark Project reservoirs because when Fry-Ark Project water is available, it has first use of Fry-Ark Project space. As described in Chapter 3 of the EIS, spill priorities were established by contract between Reclamation and Southeastern. As described in Appendix D.3, the hydrologic model makes some simplifying assumptions regarding spills from municipal excess capacity storage accounts. Table 17 shows the simulated mean annual spill from excess capacity storage space for each entity. Master Contract entities typically have small spills because their space is seldom filled to capacity. Non-Master Contract entities such as Colorado Spring and Pueblo Board of Water Works have much larger spills. Spills only occur when Pueblo Reservoir is full.

Table 17. Mean Annual Spill from Pueblo Reservoir Excess Capacity (Direct Effects).

Entity	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Long-Term Excess Capacity Accounts								
Pueblo Board of Water Works Spill	2,400	2,330	2,250	2,270	2,310	2,260	2,260	2,270
Aurora	3,180	2,970	3,090	3,050	3,020	3,080	3,130	3,120
Sub-Total	5,580	5,300	5,340	5,320	5,330	5,340	5,390	5,390
SDS Excess Capacity Accounts								
CSU	4,900	4,780	4,300	4,280	4,480	4,290	4,420	4,510
Pueblo West	870	370	410	410	470	410	380	340
Fountain	400	240	140	130	240	140	140	130
Security	50	60	60	60	60	60	60	70
Sub-Total	6,220	5,450	4,910	4,880	5,250	4,900	5,000	5,050
AVC Master Contract								
Pueblo County Group	0	70	960	960	370	960	960	100
Fowler Regionalization Group	0	0	0	0	0	0	0	0
Crowley County Group	0	0	200	200	0	200	200	410
Rocky Ford Regionalization Group	0	0	10	10	0	10	10	10
La Junta Regionalization Group	0	0	270	270	0	270	250	290
Otero County Group	0	0	30	30	0	30	30	110
Bent County Group	0	0	120	120	0	120	110	150
Sub-Total	0	70	1,590	1,590	370	1,590	1,560	1,070
Non-AVC Master Contract								
Salida	190	90	80	80	90	80	80	90
Poncha Springs	0	0	40	40	0	40	40	50
Upper Arkansas Water Cons. Dist.	20	0	0	0	0	0	0	0
Cañon City	0	0	540	540	0	550	550	550
Penrose	0	0	140	140	0	140	140	140
Florence	0	0	50	50	0	50	60	60
Pueblo West	0	0	400	390	0	400	400	440
Stratmoor Hills	50	60	80	80	60	80	80	80
Widefield	190	200	310	310	200	310	310	310
Fountain	0	0	20	20	0	20	20	20
Security	0	0	0	0	0	0	0	0
Lower Ark District	0	1,260	2,400	2,400	1,280	2,390	2,380	2,390
Sub-Total	450	1,610	4,060	4,050	1,630	4,060	4,060	4,130
Total	12,360	12,530	16,050	15,980	12,680	16,020	16,130	15,780

Other Operations

The Daily Model simulates operations for numerous entities and operations other than those directly related to AVC and the Master Contract. Major operations simulated by the Daily Model include operations of the Otero Pump Station, operations of the Fry-Ark Project, operations of the Fountain Valley Authority pipeline, operations of the Winter Water Storage Program, and diversions by other municipal, industrial and agricultural entities. The following subsections provide a brief summary of the results of simulating these systems in the Daily Model for each alternative.

Exchanges

Exchanges would be the primary means by which Master Contract space is filled by entities located downstream of Pueblo Reservoir. AVC entities whose return flows accrue to the river above John Martin Reservoir (all but Lamar and Kiowa County groups) would exchange their Fry-Ark return flows to their Pueblo Reservoir Master Contract account. Fountain, Security, Widefield and Stratmoor Hills have other supplies that flow down Fountain Creek that would also be exchanged into their Master Contract space, such as other reusable return flows and agriculture ditch shares from Fountain Mutual Irrigation Company and Lock Ditch. The Lower Arkansas Valley Water Conservancy District would exchange all of their Super Ditch supplies from the participating ditches into their Master Contract account. Colorado Springs, Fountain, Security and Pueblo West have additional exchanges with the Colorado Canal system and/or Chilcotte Ditch. Pueblo West exchanges reusable return flows from Wild Horse Creek (or the pipeline that discharges at the confluence of the Arkansas River and Wild Horse Creek) into their excess capacity storage accounts.

Mean annual direct effects simulated river exchanges into Pueblo Reservoir are presented in Table 18 The No Action Alternative and the Joint Use Pipeline North Alternative have fewer exchanges into Pueblo Reservoir because fewer participants have Master Contract accounts to exchange into.

Table 18. Mean Annual River Exchanges into Pueblo Reservoir (Direct Effects).

Exchanges (ac-ft)	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South
Colorado Springs							
Fountain Creek	6,140	6,750	6,160	6,160	6,580	6,150	6,390
Exchange Storage	0	0	0	0	0	0	0
Colorado Canal System	7,620	7,730	7,290	7,270	7,270	7,300	7,440
ROY Storage	1,070	1,090	1,230	1,230	1,100	1,240	1,140
Sub-Total	14,830	15,570	14,680	14,660	14,950	14,690	14,970
Security							
Fountain Creek	920	920	860	870	940	860	860
Fry Ark Return Flows to MC	0	0	10	10	0	10	10
FMIC to MC	0	0	390	390	0	390	390
Chilcotte to MC	0	0	20	20	0	20	20
Lock Ditch to MC	0	0	30	30	0	30	30
Sub-Total	920	920	1,310	1,320	940	1,310	1,310
Fountain							
Fountain Creek	1,210	590	2,490	2,480	590	2,490	2,490
Colorado Canal System	340	520	520	520	520	520	520
ROY Storage	130	170	170	160	170	160	160
Fountain Creek to MC	0	0	2,480	2,470	0	2,480	2,480
FMIC to MC	0	0	370	370	0	370	370
Chilcotte to MC	0	0	40	40	0	40	40
Sub-Total	1,680	1,280	6,070	6,040	1,280	6,060	6,060
Pueblo West							
Wild Horse Creek	1,590	2,580	2,640	2,640	2,570	2,640	2,640
Colorado Canal System	370	370	370	370	370	370	370
Colorado Canal to MC	0	0	100	90	0	90	100
Non-Sewered Return Flows	0	0	20	20	0	20	20
Sub-Total	1,960	2,950	3,130	3,120	2,940	3,120	3,130
Widefield							
FMIC to MC	60	160	130	130	140	130	130
Return Flow to MC	170	680	560	540	600	560	570
Sub-Total	230	840	690	670	740	690	700
Stratmoor Hills							
Fry-Ark Return Flow to MC	60	100	120	120	90	120	120
Return Flow to MC	0	50	20	20	40	20	20
Sub-Total	60	150	140	140	130	140	140
Lower Ark Super Ditch							
Exchange from Lower Ark Storage	0	3,490	4,620	4,620	3,390	4,620	4,580
Ft Lyon	0	2,420	2,380	2,380	2,370	2,380	2,380
Holbrook	0	430	390	390	400	390	390
Catlin	0	1,750	1,560	1,560	1,660	1,560	1,570
Otero	0	20	20	20	20	20	20
Oxford	0	50	40	40	50	40	40
Highline	0	210	180	170	200	180	180
Sub-Total	0	8,370	9,190	9,180	8,090	9,190	9,160
Total	19,680	30,080	35,210	35,130	29,070	35,200	35,470

Notes:

ROY – Restoration of Yield
MC – Master Contract
FMIC – Fountain Mutual Irrigation Company

Transmountain Imports

Simulated mean annual transmountain imports for each alternative are presented in Table 19. All Project participants are direct beneficiaries of Boustead Tunnel imports.

Table 19. Mean Annual Transmountain Imports to Upper Arkansas River Basin (Direct Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Import (ac-ft)								
Homestake Tunnel Import	26,960	27,040	27,030	27,030	26,980	27,030	27,020	27,030
Busk-Ivanhoe Import	2,340	2,480	2,500	2,500	2,510	2,470	2,470	2,450
Twin Lakes Import	41,150	41,050	41,190	41,170	41,100	41,190	41,160	41,040
Boustead Import	57,320	57,220	57,170	57,190	57,540	57,210	57,130	56,780
Total	127,770	127,790	127,890	127,890	128,130	127,900	127,780	127,300
Difference in Import (ac-ft)								
Homestake Tunnel Import	---	---	-10	-10	-60	-10	-20	-10
Busk-Ivanhoe Import	---	---	20	20	30	-10	-10	-30
Twin Lakes Import	---	---	140	120	50	140	110	-10
Boustead Import	---	---	-50	-30	320	-10	-90	-440
Total	---	---	100	100	340	110	-10	-490
Difference in Import (%)								
Homestake Tunnel Import	---	---	0.0	0.0	-0.2	0.0	-0.1	0.0
Busk-Ivanhoe Import	---	---	0.8	0.8	1.2	-0.4	-0.4	-1.2
Twin Lakes Import	---	---	0.3	0.3	0.1	0.3	0.3	0.0
Boustead Import	---	---	-0.1	-0.1	0.6	0.0	-0.2	-0.8
Total	---	---	0.1	0.1	0.3	0.1	0.0	-0.4

Mean annual imports through Homestake Tunnel and the Busk-Ivanhoe Tunnel are similar for all alternatives. No Master Contract or AVC participants utilize imports from these tunnels. Mean annual Twin Lakes and Boustead imports are also similar for all alternatives. The average volume of flow in the Fryingpan River near Ruedi Reservoir is calculated in Appendix D.5.

Simulated mean annual transmountain imports for cumulative effects are presented in Table 20. Imports for all alternatives would be greater than for direct effects due to the increased demands by all entities within the basin, which increases storage space availability and demand for transmountain water. As in the direct effects analysis, all simulated transmountain imports would be made within existing decreed water rights and associated limitations.

Table 20. Mean Annual Transmountain Imports to Upper Arkansas River Basin (Cumulative Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Import (ac-ft)								
Homestake Tunnel Import	26,960	30,340	30,450	30,450	30,320	30,440	30,330	30,290
Busk-Ivanhoe Import	2,340	4,660	4,630	4,630	4,590	4,630	4,580	4,650
Twin Lakes Import	41,150	44,350	44,640	44,570	44,660	44,670	44,510	44,750
Boustead Import	57,320	61,750	61,580	61,670	62,020	61,570	61,610	60,890
Total	127,770	141,100	141,300	141,320	141,590	141,310	141,030	140,580
Difference in Import (ac-ft)								
Homestake Tunnel Import	---	---	110	110	-20	100	-10	-50
Busk-Ivanhoe Import	---	---	-30	-30	-70	-30	-80	-10
Twin Lakes Import	---	---	290	220	310	320	160	400
Boustead Import	---	---	-170	-80	270	-180	-140	-860
Total	---	---	200	220	490	210	-70	-520
Difference in Import (%)								
Homestake Tunnel Import	---	---	0.4	0.4	-0.1	0.3	0.0	-0.2
Busk-Ivanhoe Import	---	---	-0.6	-0.6	-1.5	-0.6	-1.7	-0.2
Twin Lakes Import	---	---	0.7	0.5	0.7	0.7	0.4	0.9
Boustead Import	---	---	-0.3	-0.1	0.4	-0.3	-0.2	-1.4
Total	---	---	0.1	0.2	0.3	0.1	0.0	-0.4

Otero Pump Station

The Otero Pump Station would be the main facility currently used by both Aurora and Colorado Springs to take delivery of water from the Upper Arkansas River Basin, including the Homestake Tunnel and Twin Lakes Tunnel transmountain imports. Currently this water moves from Upper Basin storage to the Otero Pump Station via a pipeline. The mean annual simulated diversions by the Otero Pump Station for each alternative are presented in Table 21 for the direct effects. As shown, there is little difference in diversions by the Otero Pump Station between alternatives. The mean annual simulated diversions by the Otero Pump Station for each alternative for the cumulative effects are presented in Table 21. The volumes of water diverted at the Otero Pump Station is higher for the cumulative effects analysis than the direct effects analysis because of the increased Colorado Springs and Aurora demand. However, there are no expected differences between the alternatives in the cumulative effects.

Table 21. Mean Annual Diversion by Otero Pump Station (Direct Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Colorado Springs	46,720	46,840	46,770	46,770	46,870	46,760	46,760	46,780
Aurora	32,270	32,260	32,260	32,260	32,260	32,260	32,260	32,260
Total	78,990	79,100	79,030	79,030	79,130	79,020	79,020	79,040

Table 22. Mean Annual Diversion by Otero Pump Station (Cumulative Effects)

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Colorado Springs	46,720	62,140	61,360	61,570	62,030	61,380	62,180	61,850
Aurora	32,270	47,560	47,340	47,390	47,410	47,290	47,420	47,320
Total	78,990	109,700	108,700	108,960	109,440	108,670	109,600	109,170

Total Fry-Ark Deliveries

Fryingpan-Arkansas Project operations is a principal component to the Daily Model. Regulating storage for each of the alternatives would be located within Fry-Ark Project facilities. Deliveries of Fry-Ark allocations to AVC and Master Contract participants were previously discussed. Fry-Ark deliveries to agricultural entities and municipal entity groupings are shown in Table 23. Historically, Fort Lyon Canal and Holbrook Canal have taken less Fry-Ark deliveries than those shown in Table 23, and Fry-Ark allocations are typically not delivered to the Fort Lyon Storage Canal . Because all supplies and temporary leases diverted into these canals are not simulated in the existing conditions simulation, Fry-Ark supplies are used to meet historical demand. This simplifying assumption (i.e. occasional delivery of Fry-Ark allocations in place of sales or leases that are not simulated in the model) is not expected to change the outcome of the model.

Total Fry-Ark deliveries would be greater for the cumulative effects analysis than the direct effects analysis due to increased municipal deliveries. Increased Fry-Ark deliveries to municipal entities would therefore reduce the amount of Fry-Ark deliveries to agricultural entities. Cumulative effects results for Fry-Ark deliveries are shown in Table 24.

Table 23. Mean Annual Fry-Ark Deliveries (Direct Effects)

Agricultural Deliveries	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Municipal								
Municipal Entities West of Pueblo	620	2,980	2,240	2,240	3,090	2,250	2,240	2,230
Pueblo Board of Water Works	0	0	0	0	0	0	0	0
Fountain Valley Authority	12,670	18,300	18,030	18,120	19,170	18,010	17,930	17,650
Municipal Entities East of Pueblo	1,610	1,520	2,800	2,800	7,350	2,800	2,810	770
Sub-Total	14,900	22,800	23,070	23,160	29,610	23,060	22,980	20,650
Agricultural								
Bessemer Ditch	1,980	2,130	2,330	2,530	2,000	2,320	2,270	2,130
Excelsior Canal	160	160	140	150	160	140	140	150
Colorado Canal	70	70	70	70	60	70	70	70
High Line Canal	4,320	3,900	4,000	4,170	3,350	4,000	3,950	3,920
Oxford Canal	1,550	1,430	1,450	1,540	1,220	1,440	1,450	1,450
Otero Ditch	1,210	1,100	1,050	1,080	1,090	1,040	1,060	1,060
Catlin Canal	1,610	1,360	1,360	1,430	1,280	1,370	1,350	1,350
Fort Lyon Storage Canal (1)	10,980	10,250	10,700	10,720	10,100	10,710	10,620	10,650
Holbrook Canal	12,130	10,220	10,490	10,470	10,010	10,500	10,490	10,530
Fort Lyon Canal	16,310	15,450	15,260	15,480	15,150	15,230	15,190	15,520
Sub-Total	50,320	46,070	46,850	47,640	44,420	46,820	46,590	46,830
Total	65,220	68,870	69,920	70,800	74,030	69,880	69,570	67,480

Note:
(1) In practice, Fry-Ark water Canal is typically not delivered to Fort Lyon Storage Canal. The Fry-Ark deliveries shown offset occasional purchased and leased supplies that are not explicitly simulated. See text for additional information.

Table 24. Mean Annual Fry-Ark Deliveries (Cumulative Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Municipal								
Municipal Entities West of Pueblo	620	3,860	3,710	3,720	3,910	3,700	3,720	3,700
Pueblo Board of Water Works	0	300	500	520	250	480	520	420
Municipal Entities East of Pueblo	12,670	19,520	19,330	19,520	19,800	19,330	19,120	19,190
Fountain Valley Authority	1,610	1,950	2,770	2,730	7,560	2,770	2,750	880
Sub-Total	14,900	25,630	26,310	26,490	31,520	26,280	26,110	24,190
Agricultural								
Bessemer Ditch	1,980	2,630	2,660	2,960	2,080	2,650	2,490	2,670
Excelsior Canal	160	130	140	140	130	140	130	140
Colorado Canal	70	90	100	90	90	100	90	100
High Line Canal	4,320	2,670	2,560	2,680	2,180	2,520	2,300	2,700
Oxford Canal	1,550	1,260	1,280	1,300	1,040	1,290	1,170	1,390
Otero Canal	1,210	1,110	1,110	1,160	1,110	1,130	1,140	1,080
Catlin Canal	1,610	1,470	1,400	1,460	1,120	1,380	1,280	1,470
Fort Lyon Storage Canal (1)	10,980	11,390	11,730	11,640	11,310	11,720	11,630	11,900
Holbrook Canal	12,130	9,790	9,930	9,760	9,270	9,920	9,900	10,030
Fort Lyon Canal	16,310	14,770	14,550	14,890	13,690	14,610	14,530	14,900
Sub-Total	50,320	45,310	45,460	46,080	42,020	45,460	44,660	46,380
Total	65,220	70,940	71,770	72,570	73,540	71,740	70,770	70,570

Note:
(1) In practice, Fry-Ark water Canal is typically not delivered to Fort Lyon Storage Canal. The Fry-Ark deliveries shown offset occasional purchased and leased supplies that are not explicitly simulated. See text for additional information.

Municipal Deliveries

The municipal entities within the Arkansas River Basin would be affected by the Master Contract and AVC projects. The purpose and need of the projects is to improve the ability to deliver water to meet future municipal demands of the participants. Table 25 below shows all of the municipal entities that are explicitly simulated in the Daily Model and their simulated deliveries for direct effects and Table 26 shows cumulative effects. Most are participants in the AVC or the Master Contract. Also shown are the Pueblo Board of Water Works and Colorado Springs Utilities, who are major municipalities that are not participants in either project

Table 25. Mean Annual Municipal Deliveries (Direct Effects).

Location	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Non-AVC Master Contract Entities									
Poncha Springs	360	150	360	360	360	360	360	360	360
Salida	3,420	1,410	2,990	2,990	2,990	2,990	2,990	2,990	2,990
Upper Arkansas Water Conservancy Dist	960	600	960	960	960	960	960	960	960
Cañon City	11,080	5,600	11,050	11,080	11,080	11,070	11,080	11,080	11,080
Penrose	1,680	510	1,510	1,680	1,680	1,560	1,680	1,680	1,680
Florence	2,980	1,450	2,800	2,980	2,980	2,850	2,980	2,980	2,980
Pueblo West	10,010	6,880	10,010	10,010	10,010	10,010	10,010	10,010	10,010
Stratmoor Hills	750	640	750	750	750	750	750	750	750
Widefield	5,200	2,490	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Security	4,930	3,660	4,930	4,930	4,930	4,930	4,930	4,930	4,930
Fountain	13,170	4,370	13,170	13,170	13,170	13,170	13,170	13,170	13,170
AVC Group Entities									
Pueblo County Group	3,000	1,850	2,820	3,000	3,000	3,000	3,000	3,000	2,820
Fowler Regionalization Group	260	250	260	260	260	260	260	260	260
Crowley County Group	1,530	1,030	1,570	1,530	1,530	1,530	1,530	1,530	1,570
Rocky Ford Regionalization Group	1,170	1,010	1,170	1,170	1,170	1,170	1,170	1,170	1,170
La Junta Regionalization Group	2,650	2,220	2,600	2,650	2,650	2,650	2,650	2,650	2,600
Otero County Group	360	320	360	360	360	360	360	360	360
Bent County Group	710	660	700	710	710	710	710	710	700
Lamar Regionalization Group	1,490	0	0	1,490	1,490	1,490	1,490	1,490	0
Kiowa County Group	120	0	0	120	120	120	120	120	0
Other Municipal Entities									
Pueblo Board of Water Works	27,120	27,120	27,110	27,110	27,110	27,110	27,110	27,120	27,110
Colorado Springs Utilities	79,660	79,650	79,650	79,650	79,650	79,650	79,650	79,650	79,650
Total	172,610	141,870	169,970	172,160	172,160	171,900	172,160	172,170	170,350

Table 26. Mean Annual Municipal Deliveries (Cumulative Effects).

Location	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Non-AVC Master Contract Entities									
Poncha Springs	360	150	360	360	360	360	360	360	360
Salida	3,420	1,410	2,990	2,990	2,990	2,990	2,990	2,990	2,990
Upper Arkansas Water Conservancy	960	600	960	960	960	960	960	960	960
Cañon City	11,080	5,600	10,920	11,080	11,080	10,930	11,080	11,080	11,080
Florence	1,680	510	1,390	1,680	1,680	1,400	1,680	1,680	1,680
Penrose	2,980	1,450	2,640	2,870	2,870	2,660	2,870	2,870	2,870
Pueblo West	10,010	6,880	10,010	10,010	10,010	10,010	10,010	10,010	10,010
Stratmoor Hills	750	640	750	750	750	750	750	750	750
Widefield	5,200	2,490	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Security	4,930	3,660	4,920	4,930	4,930	4,920	4,930	4,930	4,930
Fountain	13,170	4,370	13,170	13,170	13,170	13,170	13,170	13,170	13,170
AVC Group Entities									
Pueblo Group	3,000	1,860	2,810	3,000	3,000	3,000	3,000	3,000	2,810
Fowler Group	260	250	260	260	260	260	260	260	260
Crowley County Group	1,530	1,030	1,570	1,530	1,530	1,530	1,530	1,530	1,570
Rocky Ford Group	1,170	1,010	1,170	1,170	1,170	1,170	1,170	1,170	1,170
La Junta Group	2,650	2,220	2,600	2,650	2,650	2,650	2,650	2,650	2,600
Otero County Group	360	320	360	360	360	360	360	360	360
Bent County Group	710	660	700	710	710	710	710	710	700
Lamar Group	1,490	0	0	1,490	1,490	1,490	1,490	1,490	0
Kiowa Group	120	0	0	120	120	120	120	120	0
Other Municipal Entities									
Pueblo Board of Water Works	44,440	27,120	44,430	44,420	44,420	44,420	44,420	44,430	44,430
Colorado Springs Utilities	197,660	79,650	194,100	194,030	194,090	194,120	194,020	194,160	194,110
Total	307,930	141,880	301,310	303,740	303,800	303,180	303,730	303,880	302,010

Ditch Deliveries

Operations of AVC would not directly affect senior water rights, including both direct flow and storage rights, owned by other entities within the basin. However, because several municipal entities requesting Master Contract accounts plan to utilize shares of existing irrigation ditches for supply, including those that would rotationally fallow for the Super Ditch program, deliveries to Arkansas Basin ditches may be used for different purposes.

Table 27 presents a summary of mean annual simulated deliveries to the agricultural entities in the Arkansas River Basin for the direct effects analysis, while Table 28 presents a summary of mean annual deliveries to agriculture in the Fountain Creek Basin for the direct effects analysis. Overall, mean annual deliveries would be consistent among alternatives. The existing conditions simulation shows what the ditch deliveries would be without any agricultural transfers. Slight variations between alternatives are due to the differences in alternatives discussed for Fry-Ark storage and Winter Water storage. Table 29 presents mean annual simulated deliveries to municipal entities from the ditches. This represents agricultural transfers to municipalities. The value shown includes both the consumptive use portion and the return flow requirements. The model calculates the historical return flow patterns and the consumptive use available to the municipal entities for use or storage, ensuring that only the proper portion of an agricultural transfer is simulated as municipal supply and that the historical return flow patterns would be maintained, according to Colorado water law. Agricultural transfers in Colorado must flow through the ditch, as historically done, before being exchanged up into storage or utilized by the municipal entity.

Table 27. Mean Annual Agricultural Deliveries - Arkansas River Basin (Direct Effects)

Node Description	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
South Canon Ditch	15,210	15,160	15,160	15,150	15,150	15,160	15,150	15,140	15,150
Cañon City Hydraulic Ditch	28,690	28,640	28,640	28,620	28,620	28,640	28,620	28,620	28,630
Oil Creek Ditch	15,320	15,220	15,230	15,210	15,220	15,230	15,210	15,200	15,220
Fremont County Ditch	7,300	7,290	7,290	7,290	7,290	7,290	7,290	7,280	7,290
Minnequa Canal	63,580	63,470	63,470	63,450	63,450	63,490	63,450	63,440	63,460
West Pueblo Ditch	280	280	280	270	280	280	270	270	280
Hamp Bell Ditch	30	30	30	30	30	30	30	30	30
Riverside Dairy	400	350	350	350	350	360	350	350	350
Excelsior Ditch	1,670	1,640	1,630	1,630	1,630	1,640	1,630	1,630	1,630
Collier Ditch	710	710	710	710	710	710	710	710	710
Colorado Canal (agricultural)	16,780	16,780	16,780	16,780	16,780	16,780	16,780	16,780	16,780
Fort Lyon Storage Canal	73,790	73,770	73,760	73,760	73,760	73,760	73,760	73,760	73,760
Fort Lyon Canal	250,500	250,900	248,260	247,720	247,940	248,440	247,670	247,660	247,700
Las Animas Consolidated	29,640	29,640	28,880	28,790	28,830	28,960	28,790	28,790	28,780
Rocky Ford Ditch	1,900	1,890	1,530	1,530	1,530	1,530	1,530	1,530	1,530
Oxford Farmers Canal	28,190	28,400	28,000	27,720	27,850	28,040	27,700	27,710	27,730
Otero Canal	9,070	9,160	8,730	8,670	8,700	8,730	8,660	8,660	8,660
Catlin Canal	97,950	97,170	91,550	91,160	91,290	91,800	91,130	91,100	91,130
Holbrook Canal	47,980	49,410	43,330	43,320	43,310	43,300	43,320	43,330	43,340
Bessemer Ditch	62,090	55,950	55,470	55,160	55,370	55,510	55,120	55,090	55,130
High Line Canal	91,030	89,170	88,790	88,210	88,460	88,880	88,190	88,080	88,260
Total	842,110	835,030	817,870	815,530	816,550	818,560	815,360	815,160	815,550

Table 28. Mean Annual Agricultural Deliveries – Fountain Creek Basin (Direct Effects)

Node Description	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Fountain Mutual Irrigation Company	9,190	9,140	9,140	9,130	9,140	9,140	9,130	9,140	9,140
Stubbs & Miller Ditch	440	410	410	410	410	410	410	410	410
Chilcotte Ditch	460	440	440	440	440	450	440	440	440
Crabb Ditch	110	110	110	110	110	110	110	110	110
Lock Ditch	550	340	340	340	340	340	340	340	340
Lock Ditch No 2	20	20	20	20	20	20	20	20	20
Liston and Love Ditch	280	280	280	280	280	280	280	280	280
Owen and Hall Ditch	4,190	4,080	4,080	4,080	4,080	4,080	4,080	4,080	4,080
Talcott & Cotton Ditch	1,190	1,170	1,170	1,170	1,170	1,170	1,170	1,170	1,170
Dr. Rogers	1,380	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290
Jackson and Burke Ditch	10	10	10	10	10	10	10	10	10
Burke Ditch	2,450	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Toof & Harmon Ditch	210	150	150	150	150	150	150	150	150
Wood Valley Ditch	1,910	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Total	22,390	21,340	21,340	21,330	21,340	21,350	21,330	21,340	21,340

Table 29. Mean Annual Municipal Deliveries from Agricultural Transfers (Direct Effects)

Node Description	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Fountain Mutual Irrigation Company	3,550	3,530	3,540	3,530	3,530	3,540	3,530	3,530
Fort Lyon Canal	2,800	0	2,780	2,780	2,780	2,780	2,780	2,780
Las Animas Consolidated	580	0	860	850	850	850	850	850
Rocky Ford Ditch	0	0	370	370	370	370	370	370
Oxford Farmers Ditch	930	0	460	470	470	460	470	460
Otero Canal	220	0	390	400	400	400	410	400
Catlin Canal	1,900	1,270	6,790	6,790	6,790	6,780	6,790	6,790
Holbrook Canal	20	0	4,670	4,660	4,670	4,700	4,660	4,650
Bessemer Ditch	950	6,300	6,950	6,930	6,920	6,950	6,930	6,930
High Line Canal	0	0	0	0	0	0	0	0
Total	10,950	11,100	26,810	26,780	26,780	26,830	26,790	26,760

Mean annual ditch deliveries for the cumulative effects analysis are presented in Table 30, Table 31, and Table 32.

Table 30. Mean Annual Agricultural Deliveries - Arkansas River Basin (Cumulative Effects).

Node Description	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
South Canon Ditch	15,210	15,160	14,920	14,860	14,810	14,960	14,860	14,830	14,920
Cañon City Hydraulic Ditch	28,690	28,640	28,380	28,320	28,280	28,370	28,320	28,310	28,390
Oil Creek Ditch	15,320	15,220	15,050	15,000	14,980	15,060	15,000	14,970	15,050
Fremont County Ditch	7,300	7,290	7,230	7,210	7,200	7,230	7,210	7,200	7,220
Minnequa Canal	63,580	63,470	63,110	62,970	62,920	63,100	62,980	62,890	63,090
West Pueblo Ditch	280	280	270	270	270	270	270	270	270
Hamp Bell Ditch	30	30	30	30	30	30	30	30	30
Riverside Dairy	400	350	360	350	350	360	350	360	350
Excelsior Ditch	1,670	1,640	1,660	1,660	1,660	1,660	1,660	1,660	1,660
Collier Ditch	710	710	710	710	710	710	710	710	710
Colorado Canal (agricultural)	16,780	16,780	16,770	16,780	16,780	16,780	16,780	16,780	16,780
Fort Lyon Storage Canal	73,790	73,770	73,770	73,760	73,630	73,610	73,760	73,760	73,760
Fort Lyon Canal	251,580	250,900	249,020	248,810	248,750	248,480	248,790	248,780	248,830
Las Animas Consolidated	29,890	29,640	29,070	29,040	29,040	29,110	29,040	29,060	29,020
Rocky Ford Ditch	1,900	1,890	1,530	1,530	1,530	1,530	1,530	1,530	1,530
Oxford Farmers Canal	28,580	28,400	28,210	28,120	28,150	28,150	28,110	28,130	28,120
Otero Canal	9,150	9,160	8,770	8,750	8,770	8,750	8,750	8,750	8,750
Catlin Canal	98,640	97,170	92,140	91,840	92,030	92,020	91,820	92,000	91,870
Holbrook Canal	47,880	49,410	43,120	43,070	42,950	42,910	43,060	43,060	43,130
Bessemer Ditch	62,120	55,950	55,540	55,320	55,540	55,500	55,300	55,390	55,300
High Line Canal	91,030	89,170	87,240	86,850	87,000	87,050	86,850	86,830	87,010
Total	844,530	835,030	816,900	815,250	815,380	815,640	815,180	815,300	815,790

Table 31. Mean Annual Agricultural Deliveries – Fountain Creek Basin (Cumulative Effects).

Node Description	Simulated Demand (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Fountain Mutual Irrigation Company	9,190	9,140	9,150	9,150	9,150	9,150	9,150	9,150	9,150
Stubbs & Miller Ditch	440	410	410	410	410	410	410	410	410
Chilcotte Ditch	460	440	460	460	460	460	460	460	460
Crabb Ditch	110	110	110	110	110	110	110	110	110
Lock Ditch	550	340	330	340	330	330	340	340	340
Lock Ditch No 2	20	20	20	20	20	20	20	20	20
Liston and Love Ditch	280	280	280	280	280	280	280	280	280
Owen and Hall Ditch	4,190	4,080	4,080	4,080	4,080	4,080	4,080	4,080	4,080
Talcott & Cotton Ditch	1,190	1,170	1,170	1,170	1,170	1,170	1,170	1,170	1,170
Dr. Rogers	1,380	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290
Jackson and Burke Ditch	10	10	10	10	10	10	10	10	10
Burke Ditch	2,450	2,150	2,140	2,140	2,140	2,140	2,140	2,140	2,140
Toof & Harmon Ditch	210	150	150	150	150	150	150	150	150
Wood Valley Ditch	1,910	1,750	1,740	1,740	1,750	1,740	1,740	1,740	1,750
Total	22,390	21,340	21,340	21,350	21,350	21,340	21,350	21,350	21,360

Table 32. Mean Annual Municipal Deliveries from Agricultural Transfers (Cumulative Effects).

Node Description	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Fountain Mutual Irrigation Company	3,550	3,530	3,530	3,530	3,530	3,530	3,530	3,530
Fort Lyon Canal	1,280	0	2,780	2,770	2,770	2,770	2,770	2,780
Las Animas Consolidated	320	0	860	850	850	860	850	850
Rocky Ford Ditch	0	0	360	360	360	360	360	360
Oxford Farmers Canal	530	0	460	450	460	460	460	460
Otero Canal	130	0	400	400	400	390	400	400
Catlin Canal	1,210	1,270	6,800	6,800	6,790	6,790	6,800	6,800
Holbrook Canal	120	0	4,810	4,800	4,800	4,850	4,810	4,800
Bessemer Ditch	910	6,290	6,820	6,800	6,790	6,820	6,800	6,790
Highline Canal	0	0	0	0	0	0	0	0
Total	8,050	11,090	26,820	26,760	26,750	26,830	26,780	26,770

Winter Water Storage

As with the Master Contract participants, the Winter Water Storage Program utilizes Pueblo Reservoir excess capacity for storage. However, the Winter Water Storage Program would be the last entity to spill from this storage space, and thus its operations are important in simulation of the alternatives.

Simulated diversions and deliveries for the Winter Water Storage Program are presented in Table 33. Much of the Winter Water diverted into storage is used in the same water year. Therefore, average carryover storage results (not shown) would be less than the diversion amount. Historical carryover storage in the Winter Water account in Pueblo Reservoir was about 21,000 acre feet. As with the Fry-Ark Project, there are only slight variations in simulated Winter Water Storage Program storage and deliveries among alternatives.

Deliveries are slightly higher under the cumulative effects analysis (Table 34). This occurs because of increased diversions under senior water rights by the increased municipal demands, resulting in an increased need for stored water by agricultural entities. It is assumed that with increased winter precipitation as rain and earlier runoff due to climate change, there would be more storage opportunity for the Winter Water Storage Program and therefore more deliveries for the cumulative effects as a result of climate change.

Table 33. Mean Annual Winter Water Diversions and Deliveries (Direct Effects)

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Diversions into Winter Water Storage								
Pueblo Reservoir	43,630	45,910	45,890	46,010	46,440	45,850	46,150	45,920
Colorado Canal System	18,950	18,900	19,790	19,740	19,110	19,790	19,570	19,500
Holbrook System	5,330	5,320	5,300	5,300	5,320	5,300	5,310	5,320
Fort Lyon System	49,420	49,440	49,430	49,430	49,430	49,430	49,430	49,430
Total	117,330	119,570	120,410	120,480	120,300	120,370	120,460	120,170
Deliveries from Pueblo Reservoir Winter Water Storage [1]								
Bessemer Ditch	4,240	4,440	4,620	4,650	4,540	4,620	4,660	4,560
West Pueblo Canal Colorado Canal System	10	10	10	10	10	10	10	10
Colorado Canal System	0	0	0	0	0	0	0	0
Rocky Ford Highline	9,100	8,690	8,650	8,670	9,050	8,640	8,700	8,730
Oxford Canal	4,180	4,010	3,950	3,970	4,110	3,960	3,970	3,970
Catlin Canal	5,170	4,790	4,800	4,800	4,830	4,810	4,790	4,770
Holbrook Canal	0	0	0	0	0	0	0	0
Fort Lyon Canal	1,080	980	1,080	1,030	900	1,090	1,080	1,040
Las Animas Consolidated	1,290	1,270	1,250	1,260	1,290	1,250	1,260	1,250
Total	25,070	24,190	24,360	24,390	24,730	24,380	24,470	24,330

Note:
[1] Deliveries are total at the ditch headgate. Differences between total winter water inflows to Pueblo Reservoir Storage and total winter water deliveries from Pueblo Reservoir storage are due to transit losses during delivery, reservoir evaporation and spills.

Table 34. Mean Annual Winter Water Storage and Deliveries (Cumulative Effects).

Location	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche South (ac-ft)	Pueblo Dam South (ac-ft)	JUP North (ac-ft)	Pueblo Dam North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
Diversions into Winter Water Storage								
Pueblo Reservoir	43,630	37,830	37,630	37,810	38,000	37,600	37,820	37,710
Colorado Canal System	18,950	28,940	28,950	29,020	28,700	28,970	29,310	29,130
Holbrook System	5,330	5,300	5,260	5,260	5,290	5,260	5,250	5,260
Fort Lyon System	49,420	49,740	49,860	49,690	49,760	49,860	49,870	49,800
Total	117,330	121,810	121,700	121,780	121,750	121,690	122,250	121,900
Deliveries from Pueblo Reservoir Winter Water Storage [1]								
Bessemer Ditch	4,240	6,460	6,830	6,850	6,870	6,840	7,240	6,510
West Pueblo Canal Colorado Canal System	10	20	20	20	20	20	20	20
Colorado Canal System	0	0	0	0	0	0	0	0
Rocky Ford Highline	9,100	8,790	8,820	8,860	9,100	8,830	9,050	8,700
Oxford Canal	4,180	3,450	3,500	3,490	3,480	3,480	3,590	3,380
Catlin Canal	5,170	3,140	3,090	3,110	3,130	3,110	3,220	3,030
Holbrook Canal	0	0	0	40	200	0	0	0
Fort Lyon Canal	1,080	870	1,110	900	1,070	1,110	1,130	970
Las Animas Consolidated	1,290	1,260	1,230	1,240	1,270	1,230	1,280	1,220
Total	25,070	23,990	24,600	24,510	25,140	24,620	25,530	23,830

Note:
[1] Deliveries are total at the ditch headgate. Differences between total winter water inflows to Pueblo Reservoir Storage and total winter water deliveries from Pueblo Reservoir storage are due to transit losses during delivery, reservoir evaporation and spills.

Streamflow Effects

This section describes simulated streamflow at several Arkansas River and Fountain Creek gage locations. Simulated streamflow data are a direct output of the Daily Model. Indirect output for streamflow includes estimated river stage corresponding to the simulated streamflow volumes at several of the gage locations. This data was calculated from direct model output and established rating curves from the Office of the State Engineer (Colorado Division of Water Resources 2003). This document provides a concise version of hydrologic analysis results, highlighting the locations where streamflow differences among alternatives were distinct or notable in some way, or provides a summary for an extended reach of stream. Complete results for all streamflow locations can be found on the AVC hydrology website. The qualifying statements regarding the significance of the effects, or the impact intensity, are derived from Table 35 below.

Table 35. Surface Water Hydrology Impact and Intensity Description

Impact Intensity	Intensity Description
Negligible	The alternative would change streamflow or reservoir contents, but the change would be unmeasurable or of imperceptible consequence. The change would be considered unmeasurable or imperceptible if it is within the stated accuracy of the hydrologic model used to calculate the change. The Daily Model has an average annual percent error of less than two percent at most gages, and the average monthly percent error is generally less than two percent (see Appendix D.3).
Minor	The alternative would cause a measureable change to streamflow or reservoir contents, but the change is within the accuracy of USGS streamflow measurements. The accuracy of USGS streamflow measurements is generally within 10 percent (as described by USGS for “good” streamflow gages, (2010c)). For consistency, this same percentage is used for reservoir effects.
Moderate	The alternative would cause a measurable change to streamflow or reservoir contents greater than 10 percent, but would not likely cause an adverse effect with regional consequences, such as affecting Colorado’s ability to meet Arkansas River Compact terms or affect the ability of senior water rights to divert water (based either on quantity of water or stage at diversion structure).
Major	The alternative would cause a measurable change to streamflow or reservoir contents greater than 10 percent, and would likely cause an adverse effect with regional consequences. The change would affect Colorado’s ability to meet Arkansas River Compact terms or affect the ability of senior water rights to divert water (based either on quantity of water or stage at diversion structure).

Notes: Except for “major” effects, surface water hydrology will not use “beneficial” or “adverse.” Rather, the terms of “increase” and “decrease” will be used. All impacts described will be long-term effects.

Upper Arkansas River Basin

The Upper Arkansas River Basin includes gages from the headwaters of the Arkansas River to Pueblo Reservoir, including gages on Lake Fork below Turquoise Reservoir and Lake Creek below Twin Lakes. A summary of the average annual simulated streamflow for the direct effects analysis at several of the gages in the Upper Arkansas River Basin is presented in Table 36 and Table 37.

As seen, all effects on average annual flow in the Upper Arkansas River Basin would be negligible except Lake Fork Creek, where effects would be minor. Percent changes in Lake Fork Creek are higher than in other locations because of the typical low flows in that creek.

Table 36. Mean Annual Simulated Streamflow – Upper Arkansas River Basin (Direct Effects)

Node Description	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	18	18	19	19	18	19	19	19
Lake Creek Below Twin Lakes	192	192	192	192	193	192	192	191
Arkansas River At Granite	390	390	391	390	390	391	390	390
Arkansas River At Salida	628	628	629	629	629	629	629	628
Arkansas River Near Wellsville	712	712	712	712	712	712	712	711
Arkansas River At Cañon City	741	729	730	730	730	730	730	729
Arkansas River At Portland	797	794	794	794	794	794	794	793
Effects (cfs) (Alternative – No Action Alternative)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	---	---	1	1	0	1	1	1
Lake Creek Below Twin Lakes	---	---	0	0	1	0	0	-1
Arkansas River At Granite	---	---	1	0	0	1	0	0
Arkansas River At Salida	---	---	1	1	1	1	1	0
Arkansas River Near Wellsville	---	---	0	0	0	0	0	-1
Arkansas River At Cañon City	---	---	1	1	1	1	1	0
Arkansas River At Portland	---	---	0	0	0	0	0	-1
Effects (%) (Alternative - No Action / No Action)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	---	---	5.6	5.6	0.0	5.6	5.6	5.6
Lake Creek Below Twin Lakes	---	---	0.0	0.0	0.5	0.0	0.0	-0.5
Arkansas River At Granite	---	---	0.3	0.0	0.0	0.3	0.0	0.0
Arkansas River At Salida	---	---	0.2	0.2	0.2	0.2	0.2	0.0
Arkansas River Near Wellsville	---	---	0.0	0.0	0.0	0.0	0.0	-0.1
Arkansas River At Cañon City	---	---	0.1	0.1	0.1	0.1	0.1	0.0
Arkansas River At Portland	---	---	0.0	0.0	0.0	0.0	0.0	-0.1

Table 37. Mean Annual Simulated Streamflow – Upper Arkansas River Basin (Cumulative Effects)

Node Description	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	18	13	13	13	13	13	13	14
Lake Creek Below Twin Lakes	192	174	176	176	176	176	175	174
Arkansas River At Granite	390	367	369	368	368	369	367	367
Arkansas River At Salida	628	606	607	607	606	607	606	606
Arkansas River Near Wellsville	712	689	690	690	690	690	689	689
Arkansas River At Cañon City	741	708	710	710	709	710	709	708
Arkansas River At Portland	797	774	775	775	775	775	774	774
Effects (cfs) (Alternative – No Action Alternative)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	---	---	0	0	0	0	0	1
Lake Creek Below Twin Lakes	---	---	2	2	2	2	1	0
Arkansas River At Granite	---	---	2	1	1	2	0	0
Arkansas River At Salida	---	---	1	1	0	1	0	0
Arkansas River Near Wellsville	---	---	1	1	1	1	0	0
Arkansas River At Cañon City	---	---	2	2	1	2	1	0
Arkansas River At Portland	---	---	1	1	1	1	0	0
Effects (%) (Alternative - No Action / No Action)								
Lake Fork Creek Below Sugar Loaf Dam Near Leadville	---	---	0.0	0.0	0.0	0.0	0.0	7.7
Lake Creek Below Twin Lakes	---	---	1.1	1.1	1.1	1.1	0.6	0.0
Arkansas River At Granite	---	---	0.5	0.3	0.3	0.5	0.0	0.0
Arkansas River At Salida	---	---	0.2	0.2	0.0	0.2	0.0	0.0
Arkansas River Near Wellsville	---	---	0.1	0.1	0.1	0.1	0.0	0.0
Arkansas River At Cañon City	---	---	0.3	0.3	0.1	0.3	0.1	0.0
Arkansas River At Portland	---	---	0.1	0.1	0.1	0.1	0.0	0.0

Lake Fork Creek below Sugarloaf Dam

The Lake Fork Creek below Sugarloaf Dam gage is immediately below Turquoise Reservoir and represents Turquoise Reservoir releases to Lake Fork. Mean monthly simulated streamflow for the direct effects analysis is presented in Table 38. Typical normal, dry, and wet years are shown in Table 39 through Table 41. Overall, there would be very little difference in streamflow among the alternatives. There are some minor effects due to the low streamflow in Lake Fork Creek causing the percent difference to be higher. In general, both native inflow and transmountain inflow to Turquoise Reservoir are conveyed to Twin Lakes Reservoir via the Mt. Elbert Conduit to generate power. Releases to Lake Fork are typically only made to meet target minimum flows (approximately 4 cfs during the winter and 15 cfs during the summer months) and when there is inadequate storage space in Turquoise Reservoir and the Mt. Elbert conduit to convey inflows to Twin Lakes Reservoir. Changes in river operations due to the alternatives would have little effect on flow in Lake Fork. There are moderate flow decreases in June for

Joint Use Pipeline North and moderate flow increases for the other alternatives during the typical wet year of 1997 (Table 40). This is due to the full capacities of Twin Lakes Reservoir and Turquoise Reservoir during the large runoff seen in this year. Without a Master Contract, the Joint Use Pipeline North entities use more of their Fry-Ark supplies in the AVC, reducing storage in all the Fry-Ark reservoirs compared to the other alternatives. Thus, there is more room in Twin Lakes Reservoir and Turquoise Reservoir for the runoff during this year and fewer releases have to be made to Lake Fork Creek. Mean monthly simulated streamflow for the cumulative effects scenario at the Lake Fork gage is presented in Table 42. The cumulative effects scenario would show the same general effects as the direct effects scenarios, with only slight differences in simulated streamflow the summer months. Typical normal, dry, and wet years are shown in Table 43 through Table 45.

Table 38. Overall Average Monthly Streamflow – Lake Fork Creek below Sugarloaf Dam (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	28	30	31	31	26	31	32	34
Jun	103	101	105	104	94	105	105	105
Jul	35	32	32	32	34	32	32	32
Aug	15	16	16	16	16	16	16	16
Sep	12	14	14	14	14	14	14	14
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	18	18	19	19	18	19	19	19
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	1 (3.3)	1 (3.3)	-4 (-13.3)	1 (3.3)	2 (6.7)	4 (13.3)
Jun	---	---	4 (4.0)	3 (3.0)	-7 (-6.9)	4 (4.0)	4 (4.0)	4 (4.0)
Jul	---	---	0 (0.0)	0 (0.0)	2 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (5.6)	1 (5.6)	0 (0.0)	1 (5.6)	1 (5.6)	1 (5.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	2 (7.1)	3 (10.7)	3 (10.7)	-2 (-7.1)	3 (10.7)	4 (14.3)	6 (21.4)
Jun	---	-2 (-1.9)	2 (1.9)	1 (1.0)	-9 (-8.7)	2 (1.9)	2 (1.9)	2 (1.9)
Jul	---	-3 (-8.6)	-3 (-8.6)	-3 (-8.6)	-1 (-2.9)	-3 (-8.6)	-3 (-8.6)	-3 (-8.6)
Aug	---	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)
Sep	---	2 (16.7)	2 (16.7)	2 (16.7)	2 (16.7)	2 (16.7)	2 (16.7)	2 (16.7)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.0)	1 (5.6)	1 (5.6)	0 (0.0)	1 (5.6)	1 (5.6)	1 (5.6)

Table 39. Monthly Streamflow Normal Year (2005) – Lake Fork Creek below Sugarloaf Dam (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	4	4		4		4		4		4		4		4	
Feb	4	4		4		4		4		4		4		4	
Mar	4	4		4		4		4		4		4		4	
Apr	4	4		4		4		4		4		4		4	
May	15	14		15		15		14		15		15		15	
Jun	15	15		15		15		15		15		15		15	
Jul	15	15		15		15		15		15		15		15	
Aug	15	15		15		15		15		15		15		15	
Sep	11	15		15		15		15		15		15		15	
Oct	4	4		4		4		4		4		4		4	
Nov	4	4		4		4		4		4		4		4	
Dec	4	4		4		4		4		4		4		4	
Average	8	9		9		9		9		9		9		9	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	---		1	(7.1)	1	(7.1)	0	(0.0)	1	(7.1)	1	(7.1)	1	(7.1)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	-1	(-6.7)	0	(0.0)	0	(0.0)	-1	(-6.7)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	4	(36.4)	4	(36.4)	4	(36.4)	4	(36.4)	4	(36.4)	4	(36.4)	4	(36.4)
Oct	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	1	(12.5)	1	(12.5)	1	(12.5)	1	(12.5)	1	(12.5)	1	(12.5)	1	(12.5)

Table 40. Monthly Streamflow Wet Year (1997) – Lake Fork Creek below Sugarloaf Dam (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	18	19	18	18	19	18	18	18
Jun	317	299	368	364	260	368	366	381
Jul	57	57	57	57	57	57	57	57
Aug	15	15	15	15	15	15	15	15
Sep	13	14	14	14	14	14	14	14
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	37	36	41	41	32	41	41	42
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	-1 (-5.3)	-1 (-5.3)	0 (0.0)	-1 (-5.3)	-1 (-5.3)	-1 (-5.3)
Jun	---	---	69 (23.1)	65 (21.7)	-39 (-13.0)	69 (23.1)	67 (22.4)	82 (27.4)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	5 (13.9)	5 (13.9)	-4 (-11.1)	5 (13.9)	5 (13.9)	6 (16.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	1 (5.6)	0 (0.0)	0 (0.0)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	-18 (-5.7)	51 (16.1)	47 (14.8)	-57 (-18.0)	51 (16.1)	49 (15.5)	64 (20.2)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	1 (7.7)	1 (7.7)	1 (7.7)	1 (7.7)	1 (7.7)	1 (7.7)	1 (7.7)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-1 (-2.7)	4 (10.8)	4 (10.8)	-5 (-13.5)	4 (10.8)	4 (10.8)	5 (13.5)

Table 41. Monthly Streamflow Dry Year (2004) – Lake Fork Creek below Sugarloaf Dam (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	14	15	15	15	15	15	15	15
Jun	15	15	15	15	15	15	15	15
Jul	15	15	15	15	15	15	15	15
Aug	14	15	15	15	15	15	15	15
Sep	10	15	15	15	15	15	15	15
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	8	9	9	9	9	9	9	9
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)
Sep	---	5 (50.0)	5 (50.0)	5 (50.0)	5 (50.0)	5 (50.0)	5 (50.0)	5 (50.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)

Table 42. Overall Average Monthly Streamflow – Lake Fork Creek below Sugarloaf Dam (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	5	5	5	5	5	5	5
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	28	20	20	20	20	20	20	21
Jun	103	51	51	49	46	49	48	56
Jul	35	30	30	30	29	30	30	29
Aug	15	16	16	16	16	16	16	16
Sep	12	13	13	13	13	13	13	13
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	18	13	13	13	13	13	13	14
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.0)
Jun	---	---	0 (0.0)	-2 (-3.9)	-5 (-9.8)	-2 (-3.9)	-3 (-5.9)	5 (9.8)
Jul	---	---	0 (0.0)	0 (0.0)	-1 (-3.3)	0 (0.0)	0 (0.0)	-1 (-3.3)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (7.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	-8 (-28.6)	-8 (-28.6)	-8 (-28.6)	-8 (-28.6)	-8 (-28.6)	-8 (-28.6)	-7 (-25.0)
Jun	---	-52 (-50.5)	-52 (-50.5)	-54 (-52.4)	-57 (-55.3)	-54 (-52.4)	-55 (-53.4)	-47 (-45.6)
Jul	---	-5 (-14.3)	-5 (-14.3)	-5 (-14.3)	-6 (-17.1)	-5 (-14.3)	-5 (-14.3)	-6 (-17.1)
Aug	---	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)
Sep	---	1 (8.3)	1 (8.3)	1 (8.3)	1 (8.3)	1 (8.3)	1 (8.3)	1 (8.3)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-5 (-27.8)	-5 (-27.8)	-5 (-27.8)	-5 (-27.8)	-5 (-27.8)	-5 (-27.8)	-4 (-22.2)

Table 43. Monthly Streamflow Normal Year (2005) – Lake Fork Creek below Sugarloaf Dam (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	15	14	14	14	14	14	14	14
Jun	15	15	15	15	15	15	15	15
Jul	15	15	15	15	15	15	15	15
Aug	15	15	15	15	15	15	15	15
Sep	11	14	15	15	14	15	15	15
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	8	8	9	9	8	9	9	9
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	1 (7.1)	1 (7.1)	0 (0.0)	1 (7.1)	1 (7.1)	1 (7.1)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (12.5)	1 (12.5)	0 (0.0)	1 (12.5)	1 (12.5)	1 (12.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	-1 (-6.7)	-1 (-6.7)	-1 (-6.7)	-1 (-6.7)	-1 (-6.7)	-1 (-6.7)	-1 (-6.7)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	3 (27.3)	4 (36.4)	4 (36.4)	3 (27.3)	4 (36.4)	4 (36.4)	4 (36.4)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.0)	1 (12.5)	1 (12.5)	0 (0.0)	1 (12.5)	1 (12.5)	1 (12.5)

Table 44. Monthly Streamflow Wet Year (1997) – Lake Fork Creek below Sugarloaf Dam (Cumulative Effects).

Month	Existing Conditions		No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)																
Jan	4		4		4		4		4		4		4		4	
Feb	4		4		4		4		4		4		4		4	
Mar	4		4		4		4		4		4		4		4	
Apr	4		4		4		4		4		4		4		4	
May	18		14		14		14		14		14		14		14	
Jun	317		205		216		214		227		219		216		231	
Jul	57		57		57		57		57		57		57		57	
Aug	15		15		15		15		15		15		15		15	
Sep	13		12		12		12		12		12		12		12	
Oct	4		4		4		4		4		4		4		4	
Nov	4		4		4		4		4		4		4		4	
Dec	4		4		4		4		4		4		4		4	
Average	37		27		28		28		29		29		28		30	
Change in Streamflow Compared to No Action [cfs (%)]																
Jan	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---		---		11	(5.4)	9	(4.4)	22	(10.7)	14	(6.8)	11	(5.4)	26	(12.7)
Jul	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---		---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---		---		1	(3.7)	1	(3.7)	2	(7.4)	2	(7.4)	1	(3.7)	3	(11.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]																
Jan	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---		-4	(-22.2)	-4	(-22.2)	-4	(-22.2)	-4	(-22.2)	-4	(-22.2)	-4	(-22.2)	-4	(-22.2)
Jun	---		-112	(-35.3)	-101	(-31.9)	-103	(-32.5)	-90	(-28.4)	-98	(-30.9)	-101	(-31.9)	-86	(-27.1)
Jul	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---		-1	(-7.7)	-1	(-7.7)	-1	(-7.7)	-1	(-7.7)	-1	(-7.7)	-1	(-7.7)	-1	(-7.7)
Oct	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---		-10	(-27.0)	-9	(-24.3)	-9	(-24.3)	-8	(-21.6)	-8	(-21.6)	-9	(-24.3)	-7	(-18.9)

Table 45. Monthly Streamflow Dry Year (2004) – Lake Fork Creek below Sugarloaf Dam (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	4	4	4	4	4	4	4	4
Apr	4	4	4	4	4	4	4	4
May	14	15	15	15	15	15	14	15
Jun	15	15	15	15	15	15	15	15
Jul	15	15	15	15	15	15	15	15
Aug	14	15	15	15	15	15	15	15
Sep	10	14	14	14	14	14	14	14
Oct	4	4	4	4	4	4	4	4
Nov	4	4	4	4	4	4	4	4
Dec	4	4	4	4	4	4	4	4
Average	8	9	9	9	9	9	8	9
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-6.7)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-11.1)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	0 (0.0)	1 (7.1)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)	1 (7.1)
Sep	---	4 (40.0)	4 (40.0)	4 (40.0)	4 (40.0)	4 (40.0)	4 (40.0)	4 (40.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)	1 (12.5)	0 (0.0)	1 (12.5)

Lake Creek below Twin Lakes

The Lake Creek gage is immediately below Twin Lakes Reservoir and represents Twin Lakes Reservoir releases to Lake Creek. Mean monthly simulated streamflow for the direct effects analysis is presented in Table 46. Some minor effects occur during the winter months when flows are low. During remaining portions of the year, effects are negligible. Typical normal, dry, and wet years are shown in Table 47 through Table 49. During the wet year of 1997, moderate decreases in flow are seen in the early spring months for all action alternatives except the Joint Use Pipeline North Alternative, which shows increases (Table 48). There is slightly more available space in Twin Lakes during these months than seen in the No Action and fewer releases need to be made at the beginning of the runoff season. Mean monthly simulated streamflow for the cumulative effects scenario at the Lake Creek gage is presented in Table 50. The cumulative effects scenario would show the same general effects as the direct effects scenarios. However, minor effects occur during the winter, fall and early spring months, and negligible effects during summer months. Typical normal, dry, and wet years are shown in Table 51 through Table 53.

Table 46. Overall Average Monthly Streamflow – Lake Creek below Twin Lakes (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	97	94	96	94	96	96	96	95
Feb	73	71	70	71	71	69	68	68
Mar	55	55	53	55	59	53	53	52
Apr	61	63	62	63	66	62	62	60
May	315	309	310	310	313	310	308	304
Jun	663	661	669	668	659	670	669	663
Jul	513	513	509	508	514	510	512	514
Aug	278	284	283	283	280	282	281	282
Sep	70	74	73	73	73	73	73	73
Oct	33	33	33	33	33	33	33	33
Nov	61	61	60	60	61	60	60	59
Dec	80	76	77	76	82	77	77	77
Average	192	192	192	192	193	192	192	191
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	2 (2.1)	0 (0.0)	2 (2.1)	2 (2.1)	2 (2.1)	1 (1.1)
Feb	---	---	-1 (-1.4)	0 (0.0)	0 (0.0)	-2 (-2.8)	-3 (-4.2)	-3 (-4.2)
Mar	---	---	-2 (-3.6)	0 (0.0)	4 (7.3)	-2 (-3.6)	-2 (-3.6)	-3 (-5.5)
Apr	---	---	-1 (-1.6)	0 (0.0)	3 (4.8)	-1 (-1.6)	-1 (-1.6)	-3 (-4.8)
May	---	---	1 (0.3)	1 (0.3)	4 (1.3)	1 (0.3)	-1 (-0.3)	-5 (-1.6)
Jun	---	---	8 (1.2)	7 (1.1)	-2 (-0.3)	9 (1.4)	8 (1.2)	2 (0.3)
Jul	---	---	-4 (-0.8)	-5 (-1.0)	1 (0.2)	-3 (-0.6)	-1 (-0.2)	1 (0.2)
Aug	---	---	-1 (-0.4)	-1 (-0.4)	-4 (-1.4)	-2 (-0.7)	-3 (-1.1)	-2 (-0.7)
Sep	---	---	-1 (-1.4)	-1 (-1.4)	-1 (-1.4)	-1 (-1.4)	-1 (-1.4)	-1 (-1.4)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	-1 (-1.6)	-1 (-1.6)	0 (0.0)	-1 (-1.6)	-1 (-1.6)	-2 (-3.3)
Dec	---	---	1 (1.3)	0 (0.0)	6 (7.9)	1 (1.3)	1 (1.3)	1 (1.3)
Average	---	---	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	-1 (-0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-3 (-3.1)	-1 (-1.0)	-3 (-3.1)	-1 (-1.0)	-1 (-1.0)	-1 (-1.0)	-2 (-2.1)
Feb	---	-2 (-2.7)	-3 (-4.1)	-2 (-2.7)	-2 (-2.7)	-4 (-5.5)	-5 (-6.8)	-5 (-6.8)
Mar	---	0 (0.0)	-2 (-3.6)	0 (0.0)	4 (7.3)	-2 (-3.6)	-2 (-3.6)	-3 (-5.5)
Apr	---	2 (3.3)	1 (1.6)	2 (3.3)	5 (8.2)	1 (1.6)	1 (1.6)	-1 (-1.6)
May	---	-6 (-1.9)	-5 (-1.6)	-5 (-1.6)	-2 (-0.6)	-5 (-1.6)	-7 (-2.2)	-11 (-3.5)
Jun	---	-2 (-0.3)	6 (0.9)	5 (0.8)	-4 (-0.6)	7 (1.1)	6 (0.9)	0 (0.0)
Jul	---	0 (0.0)	-4 (-0.8)	-5 (-1.0)	1 (0.2)	-3 (-0.6)	-1 (-0.2)	1 (0.2)
Aug	---	6 (2.2)	5 (1.8)	5 (1.8)	2 (0.7)	4 (1.4)	3 (1.1)	4 (1.4)
Sep	---	4 (5.7)	3 (4.3)	3 (4.3)	3 (4.3)	3 (4.3)	3 (4.3)	3 (4.3)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	-1 (-1.6)	-1 (-1.6)	0 (0.0)	-1 (-1.6)	-1 (-1.6)	-2 (-3.3)
Dec	---	-4 (-5.0)	-3 (-3.8)	-4 (-5.0)	2 (2.5)	-3 (-3.8)	-3 (-3.8)	-3 (-3.8)
Average	---	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	-1 (-0.5)

Table 47. Monthly Streamflow Normal Year (2005) – Lake Creek below Twin Lakes (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	14	14	14	14	14	14	14	14
Feb	14	14	14	14	14	14	14	14
Mar	17	17	17	17	17	17	17	17
Apr	43	45	42	42	45	42	42	42
May	322	309	311	311	308	310	310	310
Jun	532	534	535	533	527	535	541	541
Jul	406	411	409	410	411	408	408	409
Aug	241	250	243	242	251	243	243	243
Sep	40	46	42	42	46	42	42	43
Oct	50	47	50	50	47	50	50	50
Nov	55	53	54	54	53	54	54	53
Dec	83	82	81	81	81	81	81	80
Average	152	153	152	152	152	152	152	152
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	-3 (-6.7)	-3 (-6.7)	0 (0.0)	-3 (-6.7)	-3 (-6.7)	-3 (-6.7)
May	---	---	2 (0.6)	2 (0.6)	-1 (-0.3)	1 (0.3)	1 (0.3)	1 (0.3)
Jun	---	---	1 (0.2)	-1 (-0.2)	-7 (-1.3)	1 (0.2)	7 (1.3)	7 (1.3)
Jul	---	---	-2 (-0.5)	-1 (-0.2)	0 (0.0)	-3 (-0.7)	-3 (-0.7)	-2 (-0.5)
Aug	---	---	-7 (-2.8)	-8 (-3.2)	1 (0.4)	-7 (-2.8)	-7 (-2.8)	-7 (-2.8)
Sep	---	---	-4 (-8.7)	-4 (-8.7)	0 (0.0)	-4 (-8.7)	-4 (-8.7)	-3 (-6.5)
Oct	---	---	3 (6.4)	3 (6.4)	0 (0.0)	3 (6.4)	3 (6.4)	3 (6.4)
Nov	---	---	1 (1.9)	1 (1.9)	0 (0.0)	1 (1.9)	1 (1.9)	0 (0.0)
Dec	---	---	-1 (-1.2)	-1 (-1.2)	-1 (-1.2)	-1 (-1.2)	-1 (-1.2)	-2 (-2.4)
Average	---	---	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	2 (4.7)	-1 (-2.3)	-1 (-2.3)	2 (4.7)	-1 (-2.3)	-1 (-2.3)	-1 (-2.3)
May	---	-13 (-4.0)	-11 (-3.4)	-11 (-3.4)	-14 (-4.3)	-12 (-3.7)	-12 (-3.7)	-12 (-3.7)
Jun	---	2 (0.4)	3 (0.6)	1 (0.2)	-5 (-0.9)	3 (0.6)	9 (1.7)	9 (1.7)
Jul	---	5 (1.2)	3 (0.7)	4 (1.0)	5 (1.2)	2 (0.5)	2 (0.5)	3 (0.7)
Aug	---	9 (3.7)	2 (0.8)	1 (0.4)	10 (4.1)	2 (0.8)	2 (0.8)	2 (0.8)
Sep	---	6 (15.0)	2 (5.0)	2 (5.0)	6 (15.0)	2 (5.0)	2 (5.0)	3 (7.5)
Oct	---	-3 (-6.0)	0 (0.0)	0 (0.0)	-3 (-6.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	-2 (-3.6)	-1 (-1.8)	-1 (-1.8)	-2 (-3.6)	-1 (-1.8)	-1 (-1.8)	-2 (-3.6)
Dec	---	-1 (-1.2)	-2 (-2.4)	-2 (-2.4)	-2 (-2.4)	-2 (-2.4)	-2 (-2.4)	-3 (-3.6)
Average	---	1 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 48. Monthly Streamflow Wet Year (1997) – Lake Creek below Twin Lakes (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	80	85	56	56	106	56	55	50
Feb	14	14	14	14	14	14	14	14
Mar	14	18	15	15	25	15	15	15
Apr	190	196	168	168	205	168	168	158
May	557	566	562	562	565	562	563	562
Jun	855	828	835	835	824	835	836	832
Jul	708	710	709	709	710	709	709	701
Aug	395	397	394	395	392	395	395	395
Sep	90	94	93	93	94	93	93	93
Oct	44	45	45	45	45	45	45	45
Nov	58	58	58	58	58	58	58	59
Dec	102	103	102	102	103	102	102	103
Average	261	261	256	256	263	256	256	254
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-29 (-34.1)	-29 (-34.1)	21 (24.7)	-29 (-34.1)	-30 (-35.3)	-35 (-41.2)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	-3 (-16.7)	-3 (-16.7)	7 (38.9)	-3 (-16.7)	-3 (-16.7)	-3 (-16.7)
Apr	---	---	-28 (-14.3)	-28 (-14.3)	9 (4.6)	-28 (-14.3)	-28 (-14.3)	-38 (-19.4)
May	---	---	-4 (-0.7)	-4 (-0.7)	-1 (-0.2)	-4 (-0.7)	-3 (-0.5)	-4 (-0.7)
Jun	---	---	7 (0.8)	7 (0.8)	-4 (-0.5)	7 (0.8)	8 (1.0)	4 (0.5)
Jul	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	-9 (-1.3)
Aug	---	---	-3 (-0.8)	-2 (-0.5)	-5 (-1.3)	-2 (-0.5)	-2 (-0.5)	-2 (-0.5)
Sep	---	---	-1 (-1.1)	-1 (-1.1)	0 (0.0)	-1 (-1.1)	-1 (-1.1)	-1 (-1.1)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.7)
Dec	---	---	-1 (-1.0)	-1 (-1.0)	0 (0.0)	-1 (-1.0)	-1 (-1.0)	0 (0.0)
Average	---	---	-5 (-1.9)	-5 (-1.9)	2 (0.8)	-5 (-1.9)	-5 (-1.9)	-7 (-2.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	5 (6.3)	-24 (-30.0)	-24 (-30.0)	26 (32.5)	-24 (-30.0)	-25 (-31.3)	-30 (-37.5)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	4 (28.6)	1 (7.1)	1 (7.1)	11 (78.6)	1 (7.1)	1 (7.1)	1 (7.1)
Apr	---	6 (3.2)	-22 (-11.6)	-22 (-11.6)	15 (7.9)	-22 (-11.6)	-22 (-11.6)	-32 (-16.8)
May	---	9 (1.6)	5 (0.9)	5 (0.9)	8 (1.4)	5 (0.9)	6 (1.1)	5 (0.9)
Jun	---	-27 (-3.2)	-20 (-2.3)	-20 (-2.3)	-31 (-3.6)	-20 (-2.3)	-19 (-2.2)	-23 (-2.7)
Jul	---	2 (0.3)	1 (0.1)	1 (0.1)	2 (0.3)	1 (0.1)	1 (0.1)	-7 (-1.0)
Aug	---	2 (0.5)	-1 (-0.3)	0 (0.0)	-3 (-0.8)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	4 (4.4)	3 (3.3)	3 (3.3)	4 (4.4)	3 (3.3)	3 (3.3)	3 (3.3)
Oct	---	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.7)
Dec	---	1 (1.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	0 (0.0)	1 (1.0)
Average	---	0 (0.0)	-5 (-1.9)	-5 (-1.9)	2 (0.8)	-5 (-1.9)	-5 (-1.9)	-7 (-2.7)

Table 49. Monthly Streamflow Dry Year (2004) – Lake Creek below Twin Lakes (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	23	24	24	24	24	24	24	24
Feb	25	25	26	26	25	26	26	26
Mar	25	22	23	23	22	23	23	22
Apr	31	31	30	31	32	31	31	30
May	203	195	193	193	194	193	193	195
Jun	391	378	384	384	378	384	384	384
Jul	336	337	338	338	336	338	338	338
Aug	217	224	229	229	224	229	229	229
Sep	38	39	43	43	39	43	43	43
Oct	27	26	27	27	26	27	27	27
Nov	19	18	19	19	18	19	19	19
Dec	15	15	15	15	15	15	15	15
Average	113	112	113	113	112	113	113	113
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	1 (4.0)	1 (4.0)	0 (0.0)	1 (4.0)	1 (4.0)	1 (4.0)
Mar	---	---	1 (4.5)	1 (4.5)	0 (0.0)	1 (4.5)	1 (4.5)	0 (0.0)
Apr	---	---	-1 (-3.2)	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	-1 (-3.2)
May	---	---	-2 (-1.0)	-2 (-1.0)	-1 (-0.5)	-2 (-1.0)	-2 (-1.0)	0 (0.0)
Jun	---	---	6 (1.6)	6 (1.6)	0 (0.0)	6 (1.6)	6 (1.6)	6 (1.6)
Jul	---	---	1 (0.3)	1 (0.3)	-1 (-0.3)	1 (0.3)	1 (0.3)	1 (0.3)
Aug	---	---	5 (2.2)	5 (2.2)	0 (0.0)	5 (2.2)	5 (2.2)	5 (2.2)
Sep	---	---	4 (10.3)	4 (10.3)	0 (0.0)	4 (10.3)	4 (10.3)	4 (10.3)
Oct	---	---	1 (3.8)	1 (3.8)	0 (0.0)	1 (3.8)	1 (3.8)	1 (3.8)
Nov	---	---	1 (5.6)	1 (5.6)	0 (0.0)	1 (5.6)	1 (5.6)	1 (5.6)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (0.9)	1 (0.9)	0 (0.0)	1 (0.9)	1 (0.9)	1 (0.9)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)
Feb	---	0 (0.0)	1 (4.0)	1 (4.0)	0 (0.0)	1 (4.0)	1 (4.0)	1 (4.0)
Mar	---	-3 (-12.0)	-2 (-8.0)	-2 (-8.0)	-3 (-12.0)	-2 (-8.0)	-2 (-8.0)	-3 (-12.0)
Apr	---	0 (0.0)	-1 (-3.2)	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	-1 (-3.2)
May	---	-8 (-3.9)	-10 (-4.9)	-10 (-4.9)	-9 (-4.4)	-10 (-4.9)	-10 (-4.9)	-8 (-3.9)
Jun	---	-13 (-3.3)	-7 (-1.8)	-7 (-1.8)	-13 (-3.3)	-7 (-1.8)	-7 (-1.8)	-7 (-1.8)
Jul	---	1 (0.3)	2 (0.6)	2 (0.6)	0 (0.0)	2 (0.6)	2 (0.6)	2 (0.6)
Aug	---	7 (3.2)	12 (5.5)	12 (5.5)	7 (3.2)	12 (5.5)	12 (5.5)	12 (5.5)
Sep	---	1 (2.6)	5 (13.2)	5 (13.2)	1 (2.6)	5 (13.2)	5 (13.2)	5 (13.2)
Oct	---	-1 (-3.7)	0 (0.0)	0 (0.0)	-1 (-3.7)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	-1 (-5.3)	0 (0.0)	0 (0.0)	-1 (-5.3)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-1 (-0.9)	0 (0.0)	0 (0.0)	-1 (-0.9)	0 (0.0)	0 (0.0)	0 (0.0)

Table 50. Overall Average Monthly Streamflow – Lake Creek below Twin Lakes (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	97	133	139	139	137	139	135	129
Feb	73	72	75	75	77	75	76	72
Mar	55	49	48	50	53	49	51	47
Apr	61	58	58	58	59	58	59	54
May	315	239	237	236	236	237	238	236
Jun	663	542	538	541	542	539	543	543
Jul	513	455	456	453	455	456	454	457
Aug	278	239	238	237	236	238	237	238
Sep	70	40	43	42	42	43	41	42
Oct	33	40	46	44	43	46	39	42
Nov	61	88	93	92	88	92	89	92
Dec	80	130	133	133	133	133	128	128
Average	192	174	176	176	176	176	175	174
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	6 (4.5)	6 (4.5)	4 (3.0)	6 (4.5)	2 (1.5)	-4 (-3.0)
Feb	---	---	3 (4.2)	3 (4.2)	5 (6.9)	3 (4.2)	4 (5.6)	0 (0.0)
Mar	---	---	-1 (-2.0)	1 (2.0)	4 (8.2)	0 (0.0)	2 (4.1)	-2 (-4.1)
Apr	---	---	0 (0.0)	0 (0.0)	1 (1.7)	0 (0.0)	1 (1.7)	-4 (-6.9)
May	---	---	-2 (-0.8)	-3 (-1.3)	-3 (-1.3)	-2 (-0.8)	-1 (-0.4)	-3 (-1.3)
Jun	---	---	-4 (-0.7)	-1 (-0.2)	0 (0.0)	-3 (-0.6)	1 (0.2)	1 (0.2)
Jul	---	---	1 (0.2)	-2 (-0.4)	0 (0.0)	1 (0.2)	-1 (-0.2)	2 (0.4)
Aug	---	---	-1 (-0.4)	-2 (-0.8)	-3 (-1.3)	-1 (-0.4)	-2 (-0.8)	-1 (-0.4)
Sep	---	---	3 (7.5)	2 (5.0)	2 (5.0)	3 (7.5)	1 (2.5)	2 (5.0)
Oct	---	---	6 (15.0)	4 (10.0)	3 (7.5)	6 (15.0)	-1 (-2.5)	2 (5.0)
Nov	---	---	5 (5.7)	4 (4.5)	0 (0.0)	4 (4.5)	1 (1.1)	4 (4.5)
Dec	---	---	3 (2.3)	3 (2.3)	3 (2.3)	3 (2.3)	-2 (-1.5)	-2 (-1.5)
Average	---	---	2 (1.1)	2 (1.1)	2 (1.1)	2 (1.1)	1 (0.6)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	36 (37.1)	42 (43.3)	42 (43.3)	40 (41.2)	42 (43.3)	38 (39.2)	32 (33.0)
Feb	---	-1 (-1.4)	2 (2.7)	2 (2.7)	4 (5.5)	2 (2.7)	3 (4.1)	-1 (-1.4)
Mar	---	-6 (-10.9)	-7 (-12.7)	-5 (-9.1)	-2 (-3.6)	-6 (-10.9)	-4 (-7.3)	-8 (-14.5)
Apr	---	-3 (-4.9)	-3 (-4.9)	-3 (-4.9)	-2 (-3.3)	-3 (-4.9)	-2 (-3.3)	-7 (-11.5)
May	---	-7 (-24.1)	-78 (-24.8)	-79 (-25.1)	-79 (-25.1)	-78 (-24.8)	-77 (-24.4)	-79 (-25.1)
Jun	---	-121 (-18.3)	-125 (-18.9)	-122 (-18.4)	-121 (-18.3)	-124 (-18.7)	-120 (-18.1)	-120 (-18.1)
Jul	---	-58 (-11.3)	-57 (-11.1)	-60 (-11.7)	-58 (-11.3)	-57 (-11.1)	-59 (-11.5)	-56 (-10.9)
Aug	---	-39 (-14.0)	-40 (-14.4)	-41 (-14.7)	-42 (-15.1)	-40 (-14.4)	-41 (-14.7)	-40 (-14.4)
Sep	---	-30 (-42.9)	-27 (-38.6)	-28 (-40.0)	-28 (-40.0)	-27 (-38.6)	-29 (-41.4)	-28 (-40.0)
Oct	---	7 (21.2)	13 (39.4)	11 (33.3)	10 (30.3)	13 (39.4)	6 (18.2)	9 (27.3)
Nov	---	27 (44.3)	32 (52.5)	31 (50.8)	27 (44.3)	31 (50.8)	28 (45.9)	31 (50.8)
Dec	---	50 (62.5)	53 (66.3)	53 (66.3)	53 (66.3)	53 (66.3)	48 (60.0)	48 (60.0)
Average	---	-18 (-9.4)	-16 (-8.3)	-16 (-8.3)	-16 (-8.3)	-16 (-8.3)	-17 (-8.9)	-18 (-9.4)

Table 51. Monthly Streamflow Normal Year (2005) – Lake Creek below Twin Lakes (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	14	14	14	14	14	14	14	14
Feb	14	15	15	15	16	15	16	16
Mar	17	21	20	20	22	21	21	21
Apr	43	43	44	44	44	44	43	44
May	322	278	286	286	279	286	285	284
Jun	532	526	522	522	519	526	541	526
Jul	406	374	374	375	375	374	374	374
Aug	241	209	208	209	208	208	208	208
Sep	40	37	42	42	38	43	42	43
Oct	50	23	26	26	23	24	21	22
Nov	55	143	150	151	147	151	141	147
Dec	83	247	249	250	250	250	244	248
Average	152	162	163	164	162	164	163	163
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	1 (6.7)	0 (0.0)	1 (6.7)	1 (6.7)
Mar	---	---	-1 (-4.8)	-1 (-4.8)	1 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	0 (0.0)	1 (2.3)
May	---	---	8 (2.9)	8 (2.9)	1 (0.4)	8 (2.9)	7 (2.5)	6 (2.2)
Jun	---	---	-4 (-0.8)	-4 (-0.8)	-7 (-1.3)	0 (0.0)	15 (2.9)	0 (0.0)
Jul	---	---	0 (0.0)	1 (0.3)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	-1 (-0.5)	0 (0.0)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)
Sep	---	---	5 (13.5)	5 (13.5)	1 (2.7)	6 (16.2)	5 (13.5)	6 (16.2)
Oct	---	---	3 (13.0)	3 (13.0)	0 (0.0)	1 (4.3)	-2 (-8.7)	-1 (-4.3)
Nov	---	---	7 (4.9)	8 (5.6)	4 (2.8)	8 (5.6)	-2 (-1.4)	4 (2.8)
Dec	---	---	2 (0.8)	3 (1.2)	3 (1.2)	3 (1.2)	-3 (-1.2)	1 (0.4)
Average	---	---	1 (0.6)	2 (1.2)	0 (0.0)	2 (1.2)	1 (0.6)	1 (0.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	1 (7.1)	1 (7.1)	1 (7.1)	2 (14.3)	1 (7.1)	2 (14.3)	2 (14.3)
Mar	---	4 (23.5)	3 (17.6)	3 (17.6)	5 (29.4)	4 (23.5)	4 (23.5)	4 (23.5)
Apr	---	0 (0.0)	1 (2.3)	1 (2.3)	1 (2.3)	1 (2.3)	0 (0.0)	1 (2.3)
May	---	-44 (-13.7)	-36 (-11.2)	-36 (-11.2)	-43 (-13.4)	-36 (-11.2)	-37 (-11.5)	-38 (-11.8)
Jun	---	-6 (-1.1)	-10 (-1.9)	-10 (-1.9)	-13 (-2.4)	-6 (-1.1)	9 (1.7)	-6 (-1.1)
Jul	---	-32 (-7.9)	-32 (-7.9)	-31 (-7.6)	-31 (-7.6)	-32 (-7.9)	-32 (-7.9)	-32 (-7.9)
Aug	---	-32 (-13.3)	-33 (-13.7)	-32 (-13.3)	-33 (-13.7)	-33 (-13.7)	-33 (-13.7)	-33 (-13.7)
Sep	---	-3 (-7.5)	2 (5.0)	2 (5.0)	-2 (-5.0)	3 (7.5)	2 (5.0)	3 (7.5)
Oct	---	-27 (-54.0)	-24 (-48.0)	-24 (-48.0)	-27 (-54.0)	-26 (-52.0)	-29 (-58.0)	-28 (-56.0)
Nov	---	88 (160.0)	95 (172.7)	96 (174.5)	92 (167.3)	96 (174.5)	86 (156.4)	92 (167.3)
Dec	---	164 (197.6)	166 (200.0)	167 (201.2)	167 (201.2)	167 (201.2)	161 (194.0)	165 (198.8)
Average	---	10 (6.6)	11 (7.2)	12 (7.9)	10 (6.6)	12 (7.9)	11 (7.2)	11 (7.2)

Table 52. Monthly Streamflow Wet Year (1997) – Lake Creek below Twin Lakes (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	80	248	241	234	229	236	230	218
Feb	14	16	14	14	14	14	14	14
Mar	14	24	22	22	24	22	22	22
Apr	190	28	28	28	30	27	26	24
May	557	366	343	349	363	344	356	347
Jun	855	651	696	701	667	699	697	699
Jul	708	669	667	665	668	665	668	668
Aug	395	315	312	312	315	312	312	315
Sep	90	14	14	14	14	14	14	14
Oct	44	14	14	15	14	14	14	14
Nov	58	88	90	90	89	90	89	89
Dec	102	109	108	108	109	108	108	108
Average	261	214	214	214	213	214	214	213
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-7 (-2.8)	-14 (-5.6)	-19 (-7.7)	-12 (-4.8)	-18 (-7.3)	-30 (-12.1)
Feb	---	---	-2 (-12.5)	-2 (-12.5)	-2 (-12.5)	-2 (-12.5)	-2 (-12.5)	-2 (-12.5)
Mar	---	---	-2 (-8.3)	-2 (-8.3)	0 (0.0)	-2 (-8.3)	-2 (-8.3)	-2 (-8.3)
Apr	---	---	0 (0.0)	0 (0.0)	2 (7.1)	-1 (-3.6)	-2 (-7.1)	-4 (-14.3)
May	---	---	-23 (-6.3)	-17 (-4.6)	-3 (-0.8)	-22 (-6.0)	-10 (-2.7)	-19 (-5.2)
Jun	---	---	45 (6.9)	50 (7.7)	16 (2.5)	48 (7.4)	46 (7.1)	48 (7.4)
Jul	---	---	-2 (-0.3)	-4 (-0.6)	-1 (-0.1)	-4 (-0.6)	-1 (-0.1)	-1 (-0.1)
Aug	---	---	-3 (-1.0)	-3 (-1.0)	0 (0.0)	-3 (-1.0)	-3 (-1.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	1 (7.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	2 (2.3)	2 (2.3)	1 (1.1)	2 (2.3)	1 (1.1)	1 (1.1)
Dec	---	---	-1 (-0.9)	-1 (-0.9)	0 (0.0)	-1 (-0.9)	-1 (-0.9)	-1 (-0.9)
Average	---	---	0 (0.0)	0 (0.0)	-1 (-0.5)	0 (0.0)	0 (0.0)	-1 (-0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	168 (210.0)	161 (201.3)	154 (192.5)	149 (186.3)	156 (195.0)	150 (187.5)	138 (172.5)
Feb	---	2 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	10 (71.4)	8 (57.1)	8 (57.1)	10 (71.4)	8 (57.1)	8 (57.1)	8 (57.1)
Apr	---	-162 (-85.3)	-162 (-85.3)	-162 (-85.3)	-160 (-84.2)	-163 (-85.8)	-164 (-86.3)	-166 (-87.4)
May	---	-191 (-34.3)	-214 (-38.4)	-208 (-37.3)	-194 (-34.8)	-213 (-38.2)	-201 (-36.1)	-210 (-37.7)
Jun	---	-204 (-23.9)	-159 (-18.6)	-154 (-18.0)	-188 (-22.0)	-156 (-18.2)	-158 (-18.5)	-156 (-18.2)
Jul	---	-39 (-5.5)	-41 (-5.8)	-43 (-6.1)	-40 (-5.6)	-43 (-6.1)	-40 (-5.6)	-40 (-5.6)
Aug	---	-80 (-20.3)	-83 (-21.0)	-83 (-21.0)	-80 (-20.3)	-83 (-21.0)	-83 (-21.0)	-80 (-20.3)
Sep	---	-76 (-84.4)	-76 (-84.4)	-76 (-84.4)	-76 (-84.4)	-76 (-84.4)	-76 (-84.4)	-76 (-84.4)
Oct	---	-30 (-68.2)	-30 (-68.2)	-29 (-65.9)	-30 (-68.2)	-30 (-68.2)	-30 (-68.2)	-30 (-68.2)
Nov	---	30 (51.7)	32 (55.2)	32 (55.2)	31 (53.4)	32 (55.2)	31 (53.4)	31 (53.4)
Dec	---	7 (6.9)	6 (5.9)	6 (5.9)	7 (6.9)	6 (5.9)	6 (5.9)	6 (5.9)
Average	---	-47 (-18.0)	-47 (-18.0)	-47 (-18.0)	-48 (-18.4)	-47 (-18.0)	-47 (-18.0)	-48 (-18.4)

Table 53. Monthly Streamflow Dry Year (2004) – Lake Creek below Twin Lakes (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	23	24	24	24	24	24	24	24
Feb	25	26	25	25	25	25	25	25
Mar	25	22	21	21	22	21	22	22
Apr	31	33	33	33	34	32	34	33
May	203	65	68	69	67	71	76	66
Jun	391	133	135	136	135	133	130	129
Jul	336	321	322	321	321	321	323	322
Aug	217	214	215	215	215	215	214	214
Sep	38	116	125	124	121	125	117	122
Oct	27	88	97	97	96	97	83	86
Nov	19	107	106	106	110	106	98	103
Dec	15	78	65	67	74	65	73	73
Average	113	103	104	104	104	104	102	102
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	-1 (-3.8)	-1 (-3.8)	-1 (-3.8)	-1 (-3.8)	-1 (-3.8)	-1 (-3.8)
Mar	---	---	-1 (-4.5)	-1 (-4.5)	0 (0.0)	-1 (-4.5)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	1 (3.0)	-1 (-3.0)	1 (3.0)	0 (0.0)
May	---	---	3 (4.6)	4 (6.2)	2 (3.1)	6 (9.2)	11 (16.9)	1 (1.5)
Jun	---	---	2 (1.5)	3 (2.3)	2 (1.5)	0 (0.0)	-3 (-2.3)	-4 (-3.0)
Jul	---	---	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.6)	1 (0.3)
Aug	---	---	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)	0 (0.0)	0 (0.0)
Sep	---	---	9 (7.8)	8 (6.9)	5 (4.3)	9 (7.8)	1 (0.9)	6 (5.2)
Oct	---	---	9 (10.2)	9 (10.2)	8 (9.1)	9 (10.2)	-5 (-5.7)	-2 (-2.3)
Nov	---	---	-1 (-0.9)	-1 (-0.9)	3 (2.8)	-1 (-0.9)	-9 (-8.4)	-4 (-3.7)
Dec	---	---	-13 (-16.7)	-11 (-14.1)	-4 (-5.1)	-13 (-16.7)	-5 (-6.4)	-5 (-6.4)
Average	---	---	1 (1.0)	1 (1.0)	1 (1.0)	1 (1.0)	-1 (-1.0)	-1 (-1.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)	1 (4.3)
Feb	---	1 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	-3 (-12.0)	-4 (-16.0)	-4 (-16.0)	-3 (-12.0)	-4 (-16.0)	-3 (-12.0)	-3 (-12.0)
Apr	---	2 (6.5)	2 (6.5)	2 (6.5)	3 (9.7)	1 (3.2)	3 (9.7)	2 (6.5)
May	---	-138 (-68.0)	-135 (-66.5)	-134 (-66.0)	-136 (-67.0)	-132 (-65.0)	-127 (-62.6)	-137 (-67.5)
Jun	---	-258 (-66.0)	-256 (-65.5)	-255 (-65.2)	-256 (-65.5)	-258 (-66.0)	-261 (-66.8)	-262 (-67.0)
Jul	---	-15 (-4.5)	-14 (-4.2)	-15 (-4.5)	-15 (-4.5)	-15 (-4.5)	-13 (-3.9)	-14 (-4.2)
Aug	---	-3 (-1.4)	-2 (-0.9)	-2 (-0.9)	-2 (-0.9)	-2 (-0.9)	-3 (-1.4)	-3 (-1.4)
Sep	---	78 (205.3)	87 (228.9)	86 (226.3)	83 (218.4)	87 (228.9)	79 (207.9)	84 (221.1)
Oct	---	61 (225.9)	70 (259.3)	70 (259.3)	69 (255.6)	70 (259.3)	56 (207.4)	59 (218.5)
Nov	---	88 (463.2)	87 (457.9)	87 (457.9)	91 (478.9)	87 (457.9)	79 (415.8)	84 (442.1)
Dec	---	63 (420.0)	50 (333.3)	52 (346.7)	59 (393.3)	50 (333.3)	58 (386.7)	58 (386.7)
Average	---	-10 (-8.8)	-9 (-8.0)	-9 (-8.0)	-9 (-8.0)	-9 (-8.0)	-11 (-9.7)	-11 (-9.7)

Arkansas River at Granite

The Granite gage is located on the Arkansas River downstream of Lake Creek. It represents flow in the Arkansas River that includes Twin Lakes Reservoir releases to lower basin entities. Mean monthly simulated streamflow for the direct effects analysis is presented in Table 54. Some minor effects occur during February and March when flows are low. During remaining portions of the year, effects are negligible. Typical normal, dry, and wet years are shown in Table 55 through Table 57. During the wet year of 1997, moderate decreases in flow are seen in October for all action alternatives except the Joint Use Pipeline North Alternative, which shows a minor increase (Table 56). Mean monthly simulated streamflow for the cumulative effects scenario at the Granite gage is presented in Table 58. The cumulative effects scenario would show the same general effects as the direct effects scenarios. However, minor effects occur during the winter, fall and early spring months, and negligible effects during summer months. Typical normal, dry, and wet years are shown in Table 59 through Table 61.

Table 54. Overall Average Monthly Streamflow – Arkansas River at Granite (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	172	169		171		170		172		172		171		170	
Feb	146	145		143		144		145		143		141		141	
Mar	145	146		143		146		149		144		143		143	
Apr	187	190		189		189		193		189		188		187	
May	667	665		667		667		665		667		666		664	
Jun	1,346	1,343		1,355		1,355		1,335		1,356		1,356		1,350	
Jul	867	865		861		860		868		862		864		867	
Aug	467	475		474		474		471		473		472		473	
Sep	198	205		204		204		204		204		204		204	
Oct	146	146		147		147		146		147		147		147	
Nov	161	161		160		159		161		160		160		159	
Dec	164	161		162		161		167		162		161		161	
Average	390	390		391		390		390		391		390		390	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		2	(1.2)	1	(0.6)	3	(1.8)	3	(1.8)	2	(1.2)	1	(0.6)
Feb	---	---		-2	(-1.4)	-1	(-0.7)	0	(0.0)	-2	(-1.4)	-4	(-2.8)	-4	(-2.8)
Mar	---	---		-3	(-2.1)	0	(0.0)	3	(2.1)	-2	(-1.4)	-3	(-2.1)	-3	(-2.1)
Apr	---	---		-1	(-0.5)	-1	(-0.5)	3	(1.6)	-1	(-0.5)	-2	(-1.1)	-3	(-1.6)
May	---	---		2	(0.3)	2	(0.3)	0	(0.0)	2	(0.3)	1	(0.2)	-1	(-0.2)
Jun	---	---		12	(0.9)	12	(0.9)	-8	(-0.6)	13	(1.0)	13	(1.0)	7	(0.5)
Jul	---	---		-4	(-0.5)	-5	(-0.6)	3	(0.3)	-3	(-0.3)	-1	(-0.1)	2	(0.2)
Aug	---	---		-1	(-0.2)	-1	(-0.2)	-4	(-0.8)	-2	(-0.4)	-3	(-0.6)	-2	(-0.4)
Sep	---	---		-1	(-0.5)	-1	(-0.5)	-1	(-0.5)	-1	(-0.5)	-1	(-0.5)	-1	(-0.5)
Oct	---	---		1	(0.7)	1	(0.7)	0	(0.0)	1	(0.7)	1	(0.7)	1	(0.7)
Nov	---	---		-1	(-0.6)	-2	(-1.2)	0	(0.0)	-1	(-0.6)	-1	(-0.6)	-2	(-1.2)
Dec	---	---		1	(0.6)	0	(0.0)	6	(3.7)	1	(0.6)	0	(0.0)	0	(0.0)
Average	---	---		1	(0.3)	0	(0.0)	0	(0.0)	1	(0.3)	0	(0.0)	0	(0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	-3	(-1.7)	-1	(-0.6)	-2	(-1.2)	0	(0.0)	0	(0.0)	-1	(-0.6)	-2	(-1.2)
Feb	---	-1	(-0.7)	-3	(-2.1)	-2	(-1.4)	-1	(-0.7)	-3	(-2.1)	-5	(-3.4)	-5	(-3.4)
Mar	---	1	(0.7)	-2	(-1.4)	1	(0.7)	4	(2.8)	-1	(-0.7)	-2	(-1.4)	-2	(-1.4)
Apr	---	3	(1.6)	2	(1.1)	2	(1.1)	6	(3.2)	2	(1.1)	1	(0.5)	0	(0.0)
May	---	-2	(-0.3)	0	(0.0)	0	(0.0)	-2	(-0.3)	0	(0.0)	-1	(-0.1)	-3	(-0.4)
Jun	---	-3	(-0.2)	9	(0.7)	9	(0.7)	-11	(-0.8)	10	(0.7)	10	(0.7)	4	(0.3)
Jul	---	-2	(-0.2)	-6	(-0.7)	-7	(-0.8)	1	(0.1)	-5	(-0.6)	-3	(-0.3)	0	(0.0)
Aug	---	8	(1.7)	7	(1.5)	7	(1.5)	4	(0.9)	6	(1.3)	5	(1.1)	6	(1.3)
Sep	---	7	(3.5)	6	(3.0)	6	(3.0)	6	(3.0)	6	(3.0)	6	(3.0)	6	(3.0)
Oct	---	0	(0.0)	1	(0.7)	1	(0.7)	0	(0.0)	1	(0.7)	1	(0.7)	1	(0.7)
Nov	---	0	(0.0)	-1	(-0.6)	-2	(-1.2)	0	(0.0)	-1	(-0.6)	-1	(-0.6)	-2	(-1.2)
Dec	---	-3	(-1.8)	-2	(-1.2)	-3	(-1.8)	3	(1.8)	-2	(-1.2)	-3	(-1.8)	-3	(-1.8)
Average	---	0	(0.0)	1	(0.3)	1	(0.3)	1	(0.3)	1	(0.3)	1	(0.3)	0	(0.0)

Table 55. Monthly Streamflow Normal Year (2005) – Arkansas River at Granite (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	132	136	133	133	136	133	133	133
Feb	614	600	602	602	599	602	601	602
Mar	890	894	894	893	887	894	901	900
Apr	589	596	593	595	595	592	593	594
May	368	379	372	371	380	372	372	372
Jun	128	139	135	135	139	135	135	136
Jul	162	159	162	162	159	162	162	162
Aug	150	148	148	148	148	148	148	148
Sep	151	150	149	149	149	149	149	149
Oct	66	66	66	66	66	66	66	66
Nov	63	63	63	63	63	63	63	63
Dec	78	79	79	79	79	79	79	79
Average	280	282	281	281	281	281	281	281
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-3 (-2.2)	-3 (-2.2)	0 (0.0)	-3 (-2.2)	-3 (-2.2)	-3 (-2.2)
Feb	---	---	2 (0.3)	2 (0.3)	-1 (-0.2)	2 (0.3)	1 (0.2)	2 (0.3)
Mar	---	---	0 (0.0)	-1 (-0.1)	-7 (-0.8)	0 (0.0)	7 (0.8)	6 (0.7)
Apr	---	---	-3 (-0.5)	-1 (-0.2)	-1 (-0.2)	-4 (-0.7)	-3 (-0.5)	-2 (-0.3)
May	---	---	-7 (-1.8)	-8 (-2.1)	1 (0.3)	-7 (-1.8)	-7 (-1.8)	-7 (-1.8)
Jun	---	---	-4 (-2.9)	-4 (-2.9)	0 (0.0)	-4 (-2.9)	-4 (-2.9)	-3 (-2.2)
Jul	---	---	3 (1.9)	3 (1.9)	0 (0.0)	3 (1.9)	3 (1.9)	3 (1.9)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	4 (3.0)	1 (0.8)	1 (0.8)	4 (3.0)	1 (0.8)	1 (0.8)	1 (0.8)
Feb	---	-14 (-2.3)	-12 (-2.0)	-12 (-2.0)	-15 (-2.4)	-12 (-2.0)	-13 (-2.1)	-12 (-2.0)
Mar	---	4 (0.4)	4 (0.4)	3 (0.3)	-3 (-0.3)	4 (0.4)	11 (1.2)	10 (1.1)
Apr	---	7 (1.2)	4 (0.7)	6 (1.0)	6 (1.0)	3 (0.5)	4 (0.7)	5 (0.8)
May	---	11 (3.0)	4 (1.1)	3 (0.8)	12 (3.3)	4 (1.1)	4 (1.1)	4 (1.1)
Jun	---	11 (8.6)	7 (5.5)	7 (5.5)	11 (8.6)	7 (5.5)	7 (5.5)	8 (6.3)
Jul	---	-3 (-1.9)	0 (0.0)	0 (0.0)	-3 (-1.9)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)
Sep	---	-1 (-0.7)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)	-2 (-1.3)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)
Average	---	2 (0.7)	1 (0.4)	1 (0.4)	1 (0.4)	1 (0.4)	1 (0.4)	1 (0.4)

Table 56. Monthly Streamflow Wet Year (1997) – Arkansas River at Granite (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	333	340	317	317	349	317	317	312
Feb	1,010	1,021	1,018	1,018	1,020	1,018	1,018	1,018
Mar	2,239	2,194	2,270	2,266	2,153	2,270	2,269	2,279
Apr	1,115	1,121	1,117	1,117	1,121	1,117	1,117	1,109
May	631	634	631	631	629	631	632	632
Jun	257	263	261	261	263	261	261	261
Jul	178	178	178	178	178	178	178	178
Aug	174	174	174	174	174	174	174	174
Sep	201	202	201	201	202	201	201	202
Oct	174	179	150	150	200	150	150	144
Nov	107	107	107	107	107	107	107	107
Dec	134	139	132	131	146	131	131	127
Average	544	543	544	544	543	544	544	543
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-23 (-6.8)	-23 (-6.8)	9 (2.6)	-23 (-6.8)	-23 (-6.8)	-28 (-8.2)
Feb	---	---	-3 (-0.3)	-3 (-0.3)	-1 (-0.1)	-3 (-0.3)	-3 (-0.3)	-3 (-0.3)
Mar	---	---	76 (3.5)	72 (3.3)	-41 (-1.9)	76 (3.5)	75 (3.4)	85 (3.9)
Apr	---	---	-4 (-0.4)	-4 (-0.4)	0 (0.0)	-4 (-0.4)	-4 (-0.4)	-12 (-1.1)
May	---	---	-3 (-0.5)	-3 (-0.5)	-5 (-0.8)	-3 (-0.5)	-2 (-0.3)	-2 (-0.3)
Jun	---	---	-2 (-0.8)	-2 (-0.8)	0 (0.0)	-2 (-0.8)	-2 (-0.8)	-2 (-0.8)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	-1 (-0.5)	-1 (-0.5)	0 (0.0)	-1 (-0.5)	-1 (-0.5)	0 (0.0)
Oct	---	---	-29 (-16.2)	-29 (-16.2)	21 (11.7)	-29 (-16.2)	-29 (-16.2)	-35 (-19.6)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	-7 (-5.0)	-8 (-5.8)	7 (5.0)	-8 (-5.8)	-8 (-5.8)	-12 (-8.6)
Average	---	---	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	7 (2.1)	-16 (-4.8)	-16 (-4.8)	16 (4.8)	-16 (-4.8)	-16 (-4.8)	-21 (-6.3)
Feb	---	11 (1.1)	8 (0.8)	8 (0.8)	10 (1.0)	8 (0.8)	8 (0.8)	8 (0.8)
Mar	---	-45 (-2.0)	31 (1.4)	27 (1.2)	-86 (-3.8)	31 (1.4)	30 (1.3)	40 (1.8)
Apr	---	6 (0.5)	2 (0.2)	2 (0.2)	6 (0.5)	2 (0.2)	2 (0.2)	-6 (-0.5)
May	---	3 (0.5)	0 (0.0)	0 (0.0)	-2 (-0.3)	0 (0.0)	1 (0.2)	1 (0.2)
Jun	---	6 (2.3)	4 (1.6)	4 (1.6)	6 (2.3)	4 (1.6)	4 (1.6)	4 (1.6)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	1 (0.5)	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	1 (0.5)
Oct	---	5 (2.9)	-24 (-13.8)	-24 (-13.8)	26 (14.9)	-24 (-13.8)	-24 (-13.8)	-30 (-17.2)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	5 (3.7)	-2 (-1.5)	-3 (-2.2)	12 (9.0)	-3 (-2.2)	-3 (-2.2)	-7 (-5.2)
Average	---	-1 (-0.2)	0 (0.0)	0 (0.0)	-1 (-0.2)	0 (0.0)	0 (0.0)	-1 (-0.2)

Table 57. Monthly Streamflow Dry Year (2004) – Arkansas River at Granite (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	126	128	127	128	128	128	128	127
Feb	459	452	450	450	451	450	450	451
Mar	682	670	676	676	670	676	676	676
Apr	522	525	526	526	524	526	526	526
May	322	332	336	336	331	336	336	336
Jun	118	124	129	129	124	129	129	129
Jul	108	107	109	109	107	109	108	108
Aug	93	92	93	93	92	92	93	93
Sep	66	66	66	66	66	66	66	66
Oct	78	78	78	78	78	78	78	78
Nov	76	77	77	77	77	77	77	77
Dec	105	102	103	103	102	103	103	103
Average	228	228	229	229	228	229	229	229
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-0.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.8)
Feb	---	---	-2 (-0.4)	-2 (-0.4)	-1 (-0.2)	-2 (-0.4)	-2 (-0.4)	-1 (-0.2)
Mar	---	---	6 (0.9)	6 (0.9)	0 (0.0)	6 (0.9)	6 (0.9)	6 (0.9)
Apr	---	---	1 (0.2)	1 (0.2)	-1 (-0.2)	1 (0.2)	1 (0.2)	1 (0.2)
May	---	---	4 (1.2)	4 (1.2)	-1 (-0.3)	4 (1.2)	4 (1.2)	4 (1.2)
Jun	---	---	5 (4.0)	5 (4.0)	0 (0.0)	5 (4.0)	5 (4.0)	5 (4.0)
Jul	---	---	2 (1.9)	2 (1.9)	0 (0.0)	2 (1.9)	1 (0.9)	1 (0.9)
Aug	---	---	1 (1.1)	1 (1.1)	0 (0.0)	0 (0.0)	1 (1.1)	1 (1.1)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	1 (1.0)	1 (1.0)	0 (0.0)	1 (1.0)	1 (1.0)	1 (1.0)
Average	---	---	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	2 (1.6)	1 (0.8)	2 (1.6)	2 (1.6)	2 (1.6)	2 (1.6)	1 (0.8)
Feb	---	-7 (-1.5)	-9 (-2.0)	-9 (-2.0)	-8 (-1.7)	-9 (-2.0)	-9 (-2.0)	-8 (-1.7)
Mar	---	-12 (-1.8)	-6 (-0.9)	-6 (-0.9)	-12 (-1.8)	-6 (-0.9)	-6 (-0.9)	-6 (-0.9)
Apr	---	3 (0.6)	4 (0.8)	4 (0.8)	2 (0.4)	4 (0.8)	4 (0.8)	4 (0.8)
May	---	10 (3.1)	14 (4.3)	14 (4.3)	9 (2.8)	14 (4.3)	14 (4.3)	14 (4.3)
Jun	---	6 (5.1)	11 (9.3)	11 (9.3)	6 (5.1)	11 (9.3)	11 (9.3)	11 (9.3)
Jul	---	-1 (-0.9)	1 (0.9)	1 (0.9)	-1 (-0.9)	1 (0.9)	0 (0.0)	0 (0.0)
Aug	---	-1 (-1.1)	0 (0.0)	0 (0.0)	-1 (-1.1)	-1 (-1.1)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)
Dec	---	-3 (-2.9)	-2 (-1.9)	-2 (-1.9)	-3 (-2.9)	-2 (-1.9)	-2 (-1.9)	-2 (-1.9)
Average	---	0 (0.0)	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)

Table 58. Overall Average Monthly Streamflow – Arkansas River at Granite (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	172	206	212	212	211	212	208	202
Feb	146	145	148	149	150	148	150	146
Mar	145	137	136	138	141	138	140	135
Apr	187	185	185	185	186	185	185	181
May	667	584	583	582	582	583	585	583
Jun	1,346	1,174	1,170	1,171	1,169	1,169	1,171	1,180
Jul	867	805	806	804	805	806	805	807
Aug	467	430	429	428	428	429	428	429
Sep	198	170	173	173	172	173	171	172
Oct	146	153	159	157	156	159	152	155
Nov	161	188	192	192	188	192	189	191
Dec	164	214	218	217	217	217	212	212
Average	390	367	369	368	368	369	367	367
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	6 (2.9)	6 (2.9)	5 (2.4)	6 (2.9)	2 (1.0)	-4 (-1.9)
Feb	---	---	3 (2.1)	4 (2.8)	5 (3.4)	3 (2.1)	5 (3.4)	1 (0.7)
Mar	---	---	-1 (-0.7)	1 (0.7)	4 (2.9)	1 (0.7)	3 (2.2)	-2 (-1.5)
Apr	---	---	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	-4 (-2.2)
May	---	---	-1 (-0.2)	-2 (-0.3)	-2 (-0.3)	-1 (-0.2)	1 (0.2)	-1 (-0.2)
Jun	---	---	-4 (-0.3)	-3 (-0.3)	-5 (-0.4)	-5 (-0.4)	-3 (-0.3)	6 (0.5)
Jul	---	---	1 (0.1)	-1 (-0.1)	0 (0.0)	1 (0.1)	0 (0.0)	2 (0.2)
Aug	---	---	-1 (-0.2)	-2 (-0.5)	-2 (-0.5)	-1 (-0.2)	-2 (-0.5)	-1 (-0.2)
Sep	---	---	3 (1.8)	3 (1.8)	2 (1.2)	3 (1.8)	1 (0.6)	2 (1.2)
Oct	---	---	6 (3.9)	4 (2.6)	3 (2.0)	6 (3.9)	-1 (-0.7)	2 (1.3)
Nov	---	---	4 (2.1)	4 (2.1)	0 (0.0)	4 (2.1)	1 (0.5)	3 (1.6)
Dec	---	---	4 (1.9)	3 (1.4)	3 (1.4)	3 (1.4)	-2 (-0.9)	-2 (-0.9)
Average	---	---	2 (0.5)	1 (0.3)	1 (0.3)	2 (0.5)	0 (0.0)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	34 (19.8)	40 (23.3)	40 (23.3)	39 (22.7)	40 (23.3)	36 (20.9)	30 (17.4)
Feb	---	-1 (-0.7)	2 (1.4)	3 (2.1)	4 (2.7)	2 (1.4)	4 (2.7)	0 (0.0)
Mar	---	-8 (-5.5)	-9 (-6.2)	-7 (-4.8)	-4 (-2.8)	-7 (-4.8)	-5 (-3.4)	-10 (-6.9)
Apr	---	-2 (-1.1)	-2 (-1.1)	-2 (-1.1)	-1 (-0.5)	-2 (-1.1)	-2 (-1.1)	-6 (-3.2)
May	---	-83 (-12.4)	-84 (-12.6)	-85 (-12.7)	-85 (-12.7)	-84 (-12.6)	-82 (-12.3)	-84 (-12.6)
Jun	---	-172 (-12.8)	-176 (-13.1)	-175 (-13.0)	-177 (-13.2)	-177 (-13.2)	-175 (-13.0)	-166 (-12.3)
Jul	---	-62 (-7.2)	-61 (-7.0)	-63 (-7.3)	-62 (-7.2)	-61 (-7.0)	-62 (-7.2)	-60 (-6.9)
Aug	---	-37 (-7.9)	-38 (-8.1)	-39 (-8.4)	-39 (-8.4)	-38 (-8.1)	-39 (-8.4)	-38 (-8.1)
Sep	---	-28 (-14.1)	-25 (-12.6)	-25 (-12.6)	-26 (-13.1)	-25 (-12.6)	-27 (-13.6)	-26 (-13.1)
Oct	---	7 (4.8)	13 (8.9)	11 (7.5)	10 (6.8)	13 (8.9)	6 (4.1)	9 (6.2)
Nov	---	27 (16.8)	31 (19.3)	31 (19.3)	27 (16.8)	31 (19.3)	28 (17.4)	30 (18.6)
Dec	---	50 (30.5)	54 (32.9)	53 (32.3)	53 (32.3)	53 (32.3)	48 (29.3)	48 (29.3)
Average	---	-23 (-5.9)	-21 (-5.4)	-22 (-5.6)	-22 (-5.6)	-21 (-5.4)	-23 (-5.9)	-23 (-5.9)

Table 59. Monthly Streamflow Normal Year (2005) – Arkansas River at Granite (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	132	134	134	134	134	134	133	134
Feb	614	567	575	575	568	575	574	572
Mar	890	883	879	879	876	883	897	883
Apr	589	560	561	561	562	561	560	561
May	368	338	337	338	337	337	337	337
Jun	128	129	135	135	130	135	135	135
Jul	162	135	138	138	135	136	133	133
Aug	150	239	246	247	243	247	237	242
Sep	151	314	316	317	317	317	312	316
Oct	66	66	66	66	66	66	66	66
Nov	63	65	65	65	65	65	65	65
Dec	78	83	82	82	84	82	82	82
Average	280	291	292	293	291	293	292	292
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.7)	0 (0.0)
Feb	---	---	8 (1.4)	8 (1.4)	1 (0.2)	8 (1.4)	7 (1.2)	5 (0.9)
Mar	---	---	-4 (-0.5)	-4 (-0.5)	-7 (-0.8)	0 (0.0)	14 (1.6)	0 (0.0)
Apr	---	---	1 (0.2)	1 (0.2)	2 (0.4)	1 (0.2)	0 (0.0)	1 (0.2)
May	---	---	-1 (-0.3)	0 (0.0)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Jun	---	---	6 (4.7)	6 (4.7)	1 (0.8)	6 (4.7)	6 (4.7)	6 (4.7)
Jul	---	---	3 (2.2)	3 (2.2)	0 (0.0)	1 (0.7)	-2 (-1.5)	-2 (-1.5)
Aug	---	---	7 (2.9)	8 (3.3)	4 (1.7)	8 (3.3)	-2 (-0.8)	3 (1.3)
Sep	---	---	2 (0.6)	3 (1.0)	3 (1.0)	3 (1.0)	-2 (-0.6)	2 (0.6)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	-1 (-1.2)	-1 (-1.2)	1 (1.2)	-1 (-1.2)	-1 (-1.2)	-1 (-1.2)
Average	---	---	1 (0.3)	2 (0.7)	0 (0.0)	2 (0.7)	1 (0.3)	1 (0.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	2 (1.5)	2 (1.5)	2 (1.5)	2 (1.5)	2 (1.5)	1 (0.8)	2 (1.5)
Feb	---	-47 (-7.7)	-39 (-6.4)	-39 (-6.4)	-46 (-7.5)	-39 (-6.4)	-40 (-6.5)	-42 (-6.8)
Mar	---	-7 (-0.8)	-11 (-1.2)	-11 (-1.2)	-14 (-1.6)	-7 (-0.8)	7 (0.8)	-7 (-0.8)
Apr	---	-29 (-4.9)	-28 (-4.8)	-28 (-4.8)	-27 (-4.6)	-28 (-4.8)	-29 (-4.9)	-28 (-4.8)
May	---	-30 (-8.2)	-31 (-8.4)	-30 (-8.2)	-31 (-8.4)	-31 (-8.4)	-31 (-8.4)	-31 (-8.4)
Jun	---	1 (0.8)	7 (5.5)	7 (5.5)	2 (1.6)	7 (5.5)	7 (5.5)	7 (5.5)
Jul	---	-27 (-16.7)	-24 (-14.8)	-24 (-14.8)	-27 (-16.7)	-26 (-16.0)	-29 (-17.9)	-29 (-17.9)
Aug	---	89 (59.3)	96 (64.0)	97 (64.7)	93 (62.0)	97 (64.7)	87 (58.0)	92 (61.3)
Sep	---	163 (107.9)	165 (109.3)	166 (109.9)	166 (109.9)	166 (109.9)	161 (106.6)	165 (109.3)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	2 (3.2)	2 (3.2)	2 (3.2)	2 (3.2)	2 (3.2)	2 (3.2)	2 (3.2)
Dec	---	5 (6.4)	4 (5.1)	4 (5.1)	6 (7.7)	4 (5.1)	4 (5.1)	4 (5.1)
Average	---	11 (3.9)	12 (4.3)	13 (4.6)	11 (3.9)	13 (4.6)	12 (4.3)	12 (4.3)

Table 60. Monthly Streamflow Wet Year (1997) – Arkansas River at Granite (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	333	162	161	161	164	160	159	157
Feb	1,010	824	799	805	820	799	813	802
Mar	2,239	1,934	1,986	1,988	1,970	1,991	1,987	2,005
Apr	1,115	1,078	1,078	1,076	1,078	1,076	1,078	1,078
May	631	552	550	550	553	550	550	553
Jun	257	181	181	181	181	181	181	181
Jul	178	148	149	149	148	148	148	148
Aug	174	204	206	206	205	206	205	205
Sep	201	207	206	206	207	206	206	206
Oct	174	341	334	327	323	329	323	311
Nov	107	109	107	107	107	107	107	107
Dec	134	138	136	136	137	136	136	136
Average	544	488	490	489	489	489	489	489
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-0.6)	-1 (-0.6)	2 (1.2)	-2 (-1.2)	-3 (-1.9)	-5 (-3.1)
Feb	---	---	-25 (-3.0)	-19 (-2.3)	-4 (-0.5)	-25 (-3.0)	-11 (-1.3)	-22 (-2.7)
Mar	---	---	52 (2.7)	54 (2.8)	36 (1.9)	57 (2.9)	53 (2.7)	71 (3.7)
Apr	---	---	0 (0.0)	-2 (-0.2)	0 (0.0)	-2 (-0.2)	0 (0.0)	0 (0.0)
May	---	---	-2 (-0.4)	-2 (-0.4)	1 (0.2)	-2 (-0.4)	-2 (-0.4)	1 (0.2)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	1 (0.7)	1 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	2 (1.0)	2 (1.0)	1 (0.5)	2 (1.0)	1 (0.5)	1 (0.5)
Sep	---	---	-1 (-0.5)	-1 (-0.5)	0 (0.0)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)
Oct	---	---	-7 (-2.1)	-14 (-4.1)	-18 (-5.3)	-12 (-3.5)	-18 (-5.3)	-30 (-8.8)
Nov	---	---	-2 (-1.8)	-2 (-1.8)	-2 (-1.8)	-2 (-1.8)	-2 (-1.8)	-2 (-1.8)
Dec	---	---	-2 (-1.4)	-2 (-1.4)	-1 (-0.7)	-2 (-1.4)	-2 (-1.4)	-2 (-1.4)
Average	---	---	2 (0.4)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-171 (-51.4)	-172 (-51.7)	-172 (-51.7)	-169 (-50.8)	-173 (-52.0)	-174 -52.3)	-176 (-52.9)
Feb	---	-186 (-18.4)	-211 (-20.9)	-205 (-20.3)	-190 (-18.8)	-211 (-20.9)	-197 (-19.5)	-208 (-20.6)
Mar	---	-305 (-13.6)	-253 (-11.3)	-251 (-11.2)	-269 (-12.0)	-248 (-11.1)	-252 (-11.3)	-234 (-10.5)
Apr	---	-37 (-3.3)	-37 (-3.3)	-39 (-3.5)	-37 (-3.3)	-39 (-3.5)	-37 (-3.3)	-37 (-3.3)
May	---	-79 (-12.5)	-81 (-12.8)	-81 (-12.8)	-78 (-12.4)	-81 (-12.8)	-81 (-12.8)	-78 (-12.4)
Jun	---	-76 (-29.6)	-76 (-29.6)	-76 (-29.6)	-76 (-29.6)	-76 (-29.6)	-76 (-29.6)	-76 (-29.6)
Jul	---	-30 (-16.9)	-29 (-16.3)	-29 (-16.3)	-30 (-16.9)	-30 (-16.9)	-30 (-16.9)	-30 (-16.9)
Aug	---	30 (17.2)	32 (18.4)	32 (18.4)	31 (17.8)	32 (18.4)	31 (17.8)	31 (17.8)
Sep	---	6 (3.0)	5 (2.5)	5 (2.5)	6 (3.0)	5 (2.5)	5 (2.5)	5 (2.5)
Oct	---	167 (96.0)	160 (92.0)	153 (87.9)	149 (85.6)	155 (89.1)	149 (85.6)	137 (78.7)
Nov	---	2 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	4 (3.0)	2 (1.5)	2 (1.5)	3 (2.2)	2 (1.5)	2 (1.5)	2 (1.5)
Average	---	-56 (-10.3)	-54 (-9.9)	-55 (-10.1)	-55 (-10.1)	-55 (-10.1)	-55 (-10.1)	-55 (-10.1)

Table 61. Monthly Streamflow Dry Year (2004) – Arkansas River at Granite (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	126	129	129	130	130	129	130	129
Feb	459	308	312	313	310	315	320	309
Mar	682	434	435	437	436	434	434	430
Apr	522	509	510	509	510	510	509	510
May	322	322	322	323	322	322	321	321
Jun	118	201	210	209	205	209	201	207
Jul	108	169	178	177	177	178	164	167
Aug	93	180	179	179	183	180	172	176
Sep	66	128	115	116	124	114	123	122
Oct	78	78	78	78	78	78	78	78
Nov	76	77	77	77	77	77	77	77
Dec	105	103	102	102	103	102	102	103
Average	228	219	220	220	221	220	218	218
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	1 (0.8)	1 (0.8)	0 (0.0)	1 (0.8)	0 (0.0)
Feb	---	---	4 (1.3)	5 (1.6)	2 (0.6)	7 (2.3)	12 (3.9)	1 (0.3)
Mar	---	---	1 (0.2)	3 (0.7)	2 (0.5)	0 (0.0)	0 (0.0)	-4 (-0.9)
Apr	---	---	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)
May	---	---	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	-1 (-0.3)	-1 (-0.3)
Jun	---	---	9 (4.5)	8 (4.0)	4 (2.0)	8 (4.0)	0 (0.0)	6 (3.0)
Jul	---	---	9 (5.3)	8 (4.7)	8 (4.7)	9 (5.3)	-5 (-3.0)	-2 (-1.2)
Aug	---	---	-1 (-0.6)	-1 (-0.6)	3 (1.7)	0 (0.0)	-8 (-4.4)	-4 (-2.2)
Sep	---	---	-13 (-10.2)	-12 (-9.4)	-4 (-3.1)	-14 (-10.9)	-5 (-3.9)	-6 (-4.7)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	-1 (-1.0)	-1 (-1.0)	0 (0.0)	-1 (-1.0)	-1 (-1.0)	0 (0.0)
Average	---	---	1 (0.5)	1 (0.5)	2 (0.9)	1 (0.5)	-1 (-0.5)	-1 (-0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	3 (2.4)	3 (2.4)	4 (3.2)	4 (3.2)	3 (2.4)	4 (3.2)	3 (2.4)
Feb	---	-151 (-32.9)	-147 (-32.0)	-146 (-31.8)	-149 (-32.5)	-144 (-31.4)	-139 (-30.3)	-150 (-32.7)
Mar	---	-248 (-36.4)	-247 (-36.2)	-245 (-35.9)	-246 (-36.1)	-248 (-36.4)	-248 (-36.4)	-252 (-37.0)
Apr	---	-13 (-2.5)	-12 (-2.3)	-13 (-2.5)	-12 (-2.3)	-12 (-2.3)	-13 (-2.5)	-12 (-2.3)
May	---	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	-1 (-0.3)	-1 (-0.3)
Jun	---	83 (70.3)	92 (78.0)	91 (77.1)	87 (73.7)	91 (77.1)	83 (70.3)	89 (75.4)
Jul	---	61 (56.5)	70 (64.8)	69 (63.9)	69 (63.9)	70 (64.8)	56 (51.9)	59 (54.6)
Aug	---	87 (93.5)	86 (92.5)	86 (92.5)	90 (96.8)	87 (93.5)	79 (84.9)	83 (89.2)
Sep	---	62 (93.9)	49 (74.2)	50 (75.8)	58 (87.9)	48 (72.7)	57 (86.4)	56 (84.8)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)
Dec	---	-2 (-1.9)	-3 (-2.9)	-3 (-2.9)	-2 (-1.9)	-3 (-2.9)	-3 (-2.9)	-2 (-1.9)
Average	---	-9 (-3.9)	-8 (-3.5)	-8 (-3.5)	-7 (-3.1)	-8 (-3.5)	-10 (-4.4)	-10 (-4.4)

Arkansas River near Wellsville

The Arkansas River near Wellsville gage is located downstream of the major Upper Basin storage facilities used by water users to store native and transmountain inflows. Mean monthly simulated streamflow for the direct effects analysis is presented in Table 62, and typical normal year, dry year and typical wet year monthly average streamflow are presented in Table 63 through Table 65. Minor decreases in flow are seen in January of the typical wet year for all alternatives except Joint Use Pipeline North which shows a minor increase. During April of the typical wet year, all alternatives show minor effects except Joint Use Pipeline North. During this time, fewer releases are made from Twin Lakes Reservoir for alternatives with a Master Contract. Cumulative effects are presented in Table 66 through Table 69. In general, cumulative effects are negligible except for the months of January and April of the typical wet year where all alternatives have negligible to minor decreases in flows compared to the No Action Alternative.

Table 62. Overall Average Monthly Streamflow – Arkansas River near Wellsville (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	395	391	391	390	393	391	391	390
Feb	352	348	345	346	347	345	344	344
Mar	340	342	343	345	345	343	343	342
Apr	349	353	354	355	356	354	353	350
May	1,028	1,024	1,025	1,025	1,024	1,025	1,025	1,023
Jun	2,169	2,165	2,174	2,173	2,158	2,174	2,174	2,170
Jul	1,349	1,346	1,343	1,342	1,348	1,344	1,346	1,348
Aug	807	814	813	813	810	812	811	811
Sep	456	461	460	460	460	460	460	460
Oct	429	430	431	431	430	431	430	430
Nov	447	446	447	446	446	446	446	446
Dec	413	407	407	407	413	407	407	407
Average	712	712	712	712	712	712	712	711
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	-1 (-0.3)	2 (0.5)	0 (0.0)	0 (0.0)	-1 (-0.3)
Feb	---	---	-3 (-0.9)	-2 (-0.6)	-1 (-0.3)	-3 (-0.9)	-4 (-1.1)	-4 (-1.1)
Mar	---	---	1 (0.3)	3 (0.9)	3 (0.9)	1 (0.3)	1 (0.3)	0 (0.0)
Apr	---	---	1 (0.3)	2 (0.6)	3 (0.8)	1 (0.3)	0 (0.0)	-3 (-0.8)
May	---	---	1 (0.1)	1 (0.1)	0 (0.0)	1 (0.1)	1 (0.1)	-1 (-0.1)
Jun	---	---	9 (0.4)	8 (0.4)	-7 (-0.3)	9 (0.4)	9 (0.4)	5 (0.2)
Jul	---	---	-3 (-0.2)	-4 (-0.3)	2 (0.1)	-2 (-0.1)	0 (0.0)	2 (0.1)
Aug	---	---	-1 (-0.1)	-1 (-0.1)	-4 (-0.5)	-2 (-0.2)	-3 (-0.4)	-3 (-0.4)
Sep	---	---	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)
Oct	---	---	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	0 (0.0)	0 (0.0)
Nov	---	---	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	6 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-4 (-1.0)	-4 (-1.0)	-5 (-1.3)	-2 (-0.5)	-4 (-1.0)	-4 (-1.0)	-5 (-1.3)
Feb	---	-4 (-1.1)	-7 (-2.0)	-6 (-1.7)	-5 (-1.4)	-7 (-2.0)	-8 (-2.3)	-8 (-2.3)
Mar	---	2 (0.6)	3 (0.9)	5 (1.5)	5 (1.5)	3 (0.9)	3 (0.9)	2 (0.6)
Apr	---	4 (1.1)	5 (1.4)	6 (1.7)	7 (2.0)	5 (1.4)	4 (1.1)	1 (0.3)
May	---	-4 (-0.4)	-3 (-0.3)	-3 (-0.3)	-4 (-0.4)	-3 (-0.3)	-3 (-0.3)	-5 (-0.5)
Jun	---	-4 (-0.2)	5 (0.2)	4 (0.2)	-11 (-0.5)	5 (0.2)	5 (0.2)	1 (0.0)
Jul	---	-3 (-0.2)	-6 (-0.4)	-7 (-0.5)	-1 (-0.1)	-5 (-0.4)	-3 (-0.2)	-1 (-0.1)
Aug	---	7 (0.9)	6 (0.7)	6 (0.7)	3 (0.4)	5 (0.6)	4 (0.5)	4 (0.5)
Sep	---	5 (1.1)	4 (0.9)	4 (0.9)	4 (0.9)	4 (0.9)	4 (0.9)	4 (0.9)
Oct	---	1 (0.2)	2 (0.5)	2 (0.5)	1 (0.2)	2 (0.5)	1 (0.2)	1 (0.2)
Nov	---	-1 (-0.2)	0 (0.0)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)
Dec	---	-6 (-1.5)	-6 (-1.5)	-6 (-1.5)	0 (0.0)	-6 (-1.5)	-6 (-1.5)	-6 (-1.5)
Average	---	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-2 (-0.3)

Table 63. Monthly Streamflow Normal Year (2005) – Arkansas River near Wellsville (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	294	294	284	284	294	284	286	287
Feb	261	260	257	259	260	258	260	260
Mar	258	256	260	260	256	260	260	260
Apr	263	264	262	262	264	262	263	262
May	957	955	968	968	959	968	965	967
Jun	1,533	1,536	1,536	1,535	1,528	1,536	1,543	1,542
Jul	932	938	934	936	936	933	934	935
Aug	601	610	603	602	611	603	604	603
Sep	292	302	299	301	302	301	300	297
Oct	427	425	427	427	425	427	427	427
Nov	412	409	412	412	409	412	412	412
Dec	409	406	405	405	405	406	406	405
Average	555	556	556	556	556	556	557	556
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-10 (-3.4)	-10 (-3.4)	0 (0.0)	-10 (-3.4)	-8 (-2.7)	-7 (-2.4)
Feb	---	---	-3 (-1.2)	-1 (-0.4)	0 (0.0)	-2 (-0.8)	0 (0.0)	0 (0.0)
Mar	---	---	4 (1.6)	4 (1.6)	0 (0.0)	4 (1.6)	4 (1.6)	4 (1.6)
Apr	---	---	-2 (-0.8)	-2 (-0.8)	0 (0.0)	-2 (-0.8)	-1 (-0.4)	-2 (-0.8)
May	---	---	13 (1.4)	13 (1.4)	4 (0.4)	13 (1.4)	10 (1.0)	12 (1.3)
Jun	---	---	0 (0.0)	-1 (-0.1)	-8 (-0.5)	0 (0.0)	7 (0.5)	6 (0.4)
Jul	---	---	-4 (-0.4)	-2 (-0.2)	-2 (-0.2)	-5 (-0.5)	-4 (-0.4)	-3 (-0.3)
Aug	---	---	-7 (-1.1)	-8 (-1.3)	1 (0.2)	-7 (-1.1)	-6 (-1.0)	-7 (-1.1)
Sep	---	---	-3 (-1.0)	-1 (-0.3)	0 (0.0)	-1 (-0.3)	-2 (-0.7)	-5 (-1.7)
Oct	---	---	2 (0.5)	2 (0.5)	0 (0.0)	2 (0.5)	2 (0.5)	2 (0.5)
Nov	---	---	3 (0.7)	3 (0.7)	0 (0.0)	3 (0.7)	3 (0.7)	3 (0.7)
Dec	---	---	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)	0 (0.0)	0 (0.0)	-1 (-0.2)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	-10 (-3.4)	-10 (-3.4)	0 (0.0)	-10 (-3.4)	-8 (-2.7)	-7 (-2.4)
Feb	---	-1 (-0.4)	-4 (-1.5)	-2 (-0.8)	-1 (-0.4)	-3 (-1.1)	-1 (-0.4)	-1 (-0.4)
Mar	---	-2 (-0.8)	2 (0.8)	2 (0.8)	-2 (-0.8)	2 (0.8)	2 (0.8)	2 (0.8)
Apr	---	1 (0.4)	-1 (-0.4)	-1 (-0.4)	1 (0.4)	-1 (-0.4)	0 (0.0)	-1 (-0.4)
May	---	-2 (-0.2)	11 (1.1)	11 (1.1)	2 (0.2)	11 (1.1)	8 (0.8)	10 (1.0)
Jun	---	3 (0.2)	3 (0.2)	2 (0.1)	-5 (-0.3)	3 (0.2)	10 (0.7)	9 (0.6)
Jul	---	6 (0.6)	2 (0.2)	4 (0.4)	4 (0.4)	1 (0.1)	2 (0.2)	3 (0.3)
Aug	---	9 (1.5)	2 (0.3)	1 (0.2)	10 (1.7)	2 (0.3)	3 (0.5)	2 (0.3)
Sep	---	10 (3.4)	7 (2.4)	9 (3.1)	10 (3.4)	9 (3.1)	8 (2.7)	5 (1.7)
Oct	---	-2 (-0.5)	0 (0.0)	0 (0.0)	-2 (-0.5)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	-3 (-0.7)	0 (0.0)	0 (0.0)	-3 (-0.7)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	-3 (-0.7)	-4 (-1.0)	-4 (-1.0)	-4 (-1.0)	-3 (-0.7)	-3 (-0.7)	-4 (-1.0)
Average	---	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	2 (0.4)	1 (0.2)

Table 64. Monthly Streamflow Wet Year (1997) – Arkansas River near Wellsville (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	402	405	377	377	425	377	377	372
Feb	307	297	297	297	298	297	297	297
Mar	333	336	338	338	348	338	338	337
Apr	512	517	490	491	526	491	490	481
May	1,375	1,384	1,356	1,356	1,383	1,356	1,357	1,356
Jun	3,775	3,734	3,785	3,779	3,692	3,786	3,786	3,811
Jul	1,706	1,708	1,708	1,708	1,708	1,708	1,708	1,700
Aug	1,113	1,114	1,112	1,112	1,110	1,112	1,113	1,113
Sep	559	564	562	562	564	562	563	562
Oct	510	511	512	512	511	512	512	512
Nov	523	518	523	523	518	523	523	523
Dec	492	492	480	481	491	480	480	483
Average	969	966	963	963	966	963	963	963
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-28 (-6.9)	-28 (-6.9)	20 (4.9)	-28 (-6.9)	-28 (-6.9)	-33 (-8.1)
Feb	---	---	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	2 (0.6)	2 (0.6)	12 (3.6)	2 (0.6)	2 (0.6)	1 (0.3)
Apr	---	---	-27 (-5.2)	-26 (-5.0)	9 (1.7)	-26 (-5.0)	-27 (-5.2)	-36 (-7.0)
May	---	---	-28 (-2.0)	-28 (-2.0)	-1 (-0.1)	-28 (-2.0)	-27 (-2.0)	-28 (-2.0)
Jun	---	---	51 (1.4)	45 (1.2)	-42 (-1.1)	52 (1.4)	52 (1.4)	77 (2.1)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-8 (-0.5)
Aug	---	---	-2 (-0.2)	-2 (-0.2)	-4 (-0.4)	-2 (-0.2)	-1 (-0.1)	-1 (-0.1)
Sep	---	---	-2 (-0.4)	-2 (-0.4)	0 (0.0)	-2 (-0.4)	-1 (-0.2)	-2 (-0.4)
Oct	---	---	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	1 (0.2)
Nov	---	---	5 (1.0)	5 (1.0)	0 (0.0)	5 (1.0)	5 (1.0)	5 (1.0)
Dec	---	---	-12 (-2.4)	-11 (-2.2)	-1 (-0.2)	-12 (-2.4)	-12 (-2.4)	-9 (-1.8)
Average	---	---	-3 (-0.3)	-3 (-0.3)	0 (0.0)	-3 (-0.3)	-3 (-0.3)	-3 (-0.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	3 (0.7)	-25 (-6.2)	-25 (-6.2)	23 (5.7)	-25 (-6.2)	-25 (-6.2)	-30 (-7.5)
Feb	---	-10 (-3.3)	-10 (-3.3)	-10 (-3.3)	-9 (-2.9)	-10 (-3.3)	-10 (-3.3)	-10 (-3.3)
Mar	---	3 (0.9)	5 (1.5)	5 (1.5)	15 (4.5)	5 (1.5)	5 (1.5)	4 (1.2)
Apr	---	5 (1.0)	-22 (-4.3)	-21 (-4.1)	14 (2.7)	-21 (-4.1)	-22 (-4.3)	-31 (-6.1)
May	---	9 (0.7)	-19 (-1.4)	-19 (-1.4)	8 (0.6)	-19 (-1.4)	-18 (-1.3)	-19 (-1.4)
Jun	---	-41 (-1.1)	10 (0.3)	4 (0.1)	-83 (-2.2)	11 (0.3)	11 (0.3)	36 (1.0)
Jul	---	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	-6 (-0.4)
Aug	---	1 (0.1)	-1 (-0.1)	-1 (-0.1)	-3 (-0.3)	-1 (-0.1)	0 (0.0)	0 (0.0)
Sep	---	5 (0.9)	3 (0.5)	3 (0.5)	5 (0.9)	3 (0.5)	4 (0.7)	3 (0.5)
Oct	---	1 (0.2)	2 (0.4)	2 (0.4)	1 (0.2)	2 (0.4)	2 (0.4)	2 (0.4)
Nov	---	-5 (-1.0)	0 (0.0)	0 (0.0)	-5 (-1.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	-12 (-2.4)	-11 (-2.2)	-1 (-0.2)	-12 (-2.4)	-12 (-2.4)	-9 (-1.8)
Average	---	-3 (-0.3)	-6 (-0.6)	-6 (-0.6)	-3 (-0.3)	-6 (-0.6)	-6 (-0.6)	-6 (-0.6)

Table 65. Monthly Streamflow Dry Year (2004) – Arkansas River near Wellsville (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	252	252	252	252	252	252	252	252
Feb	252	252	253	253	252	253	253	253
Mar	251	252	258	258	252	258	258	259
Apr	261	262	261	262	263	261	262	261
May	753	747	744	745	745	745	745	746
Jun	1,192	1,180	1,185	1,185	1,180	1,185	1,185	1,185
Jul	815	816	817	817	816	818	818	817
Aug	522	531	535	535	530	535	535	534
Sep	294	299	303	303	298	303	303	303
Oct	318	321	326	326	324	326	321	320
Nov	338	338	337	337	338	337	337	337
Dec	318	313	310	310	312	310	310	310
Average	465	465	466	466	465	466	466	466
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)
Mar	---	---	6 (2.4)	6 (2.4)	0 (0.0)	6 (2.4)	6 (2.4)	7 (2.8)
Apr	---	---	-1 (-0.4)	0 (0.0)	1 (0.4)	-1 (-0.4)	0 (0.0)	-1 (-0.4)
May	---	---	-3 (-0.4)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-1 (-0.1)
Jun	---	---	5 (0.4)	5 (0.4)	0 (0.0)	5 (0.4)	5 (0.4)	5 (0.4)
Jul	---	---	1 (0.1)	1 (0.1)	0 (0.0)	2 (0.2)	2 (0.2)	1 (0.1)
Aug	---	---	4 (0.8)	4 (0.8)	-1 (-0.2)	4 (0.8)	4 (0.8)	3 (0.6)
Sep	---	---	4 (1.3)	4 (1.3)	-1 (-0.3)	4 (1.3)	4 (1.3)	4 (1.3)
Oct	---	---	5 (1.6)	5 (1.6)	3 (0.9)	5 (1.6)	0 (0.0)	-1 (-0.3)
Nov	---	---	-1 (-0.3)	-1 (-0.3)	0 (0.0)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Dec	---	---	-3 (-1.0)	-3 (-1.0)	-1 (-0.3)	-3 (-1.0)	-3 (-1.0)	-3 (-1.0)
Average	---	---	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	1 (0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)
Mar	---	1 (0.4)	7 (2.8)	7 (2.8)	1 (0.4)	7 (2.8)	7 (2.8)	8 (3.2)
Apr	---	1 (0.4)	0 (0.0)	1 (0.4)	2 (0.8)	0 (0.0)	1 (0.4)	0 (0.0)
May	---	-6 (-0.8)	-9 (-1.2)	-8 (-1.1)	-8 (-1.1)	-8 (-1.1)	-8 (-1.1)	-7 (-0.9)
Jun	---	-12 (-1.0)	-7 (-0.6)	-7 (-0.6)	-12 (-1.0)	-7 (-0.6)	-7 (-0.6)	-7 (-0.6)
Jul	---	1 (0.1)	2 (0.2)	2 (0.2)	1 (0.1)	3 (0.4)	3 (0.4)	2 (0.2)
Aug	---	9 (1.7)	13 (2.5)	13 (2.5)	8 (1.5)	13 (2.5)	13 (2.5)	12 (2.3)
Sep	---	5 (1.7)	9 (3.1)	9 (3.1)	4 (1.4)	9 (3.1)	9 (3.1)	9 (3.1)
Oct	---	3 (0.9)	8 (2.5)	8 (2.5)	6 (1.9)	8 (2.5)	3 (0.9)	2 (0.6)
Nov	---	0 (0.0)	-1 (-0.3)	-1 (-0.3)	0 (0.0)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Dec	---	-5 (-1.6)	-8 (-2.5)	-8 (-2.5)	-6 (-1.9)	-8 (-2.5)	-8 (-2.5)	-8 (-2.5)
Average	---	0 (0.0)	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	1 (0.2)

Table 66. Overall Average Monthly Streamflow – Arkansas River near Wellsville (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	395	422	427	428	426	428	423	418
Feb	352	344	346	346	348	346	347	344
Mar	340	338	338	339	341	339	342	337
Apr	349	361	360	361	361	361	362	357
May	1,028	938	933	932	933	932	935	934
Jun	2,169	1,986	1,980	1,981	1,983	1,979	1,980	1,991
Jul	1,349	1,289	1,291	1,289	1,289	1,291	1,290	1,291
Aug	807	776	777	777	773	777	776	776
Sep	456	433	436	436	435	436	434	435
Oct	429	437	443	441	441	443	436	439
Nov	447	474	478	477	474	478	475	478
Dec	413	457	460	460	460	460	455	455
Average	712	689	690	690	690	690	689	689
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	5 (1.2)	6 (1.4)	4 (0.9)	6 (1.4)	1 (0.2)	-4 (-0.9)
Feb	---	---	2 (0.6)	2 (0.6)	4 (1.2)	2 (0.6)	3 (0.9)	0 (0.0)
Mar	---	---	0 (0.0)	1 (0.3)	3 (0.9)	1 (0.3)	4 (1.2)	-1 (-0.3)
Apr	---	---	-1 (-0.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	-4 (-1.1)
May	---	---	-5 (-0.5)	-6 (-0.6)	-5 (-0.5)	-6 (-0.6)	-3 (-0.3)	-4 (-0.4)
Jun	---	---	-6 (-0.3)	-5 (-0.3)	-3 (-0.2)	-7 (-0.4)	-6 (-0.3)	5 (0.3)
Jul	---	---	2 (0.2)	0 (0.0)	0 (0.0)	2 (0.2)	1 (0.1)	2 (0.2)
Aug	---	---	1 (0.1)	1 (0.1)	-3 (-0.4)	1 (0.1)	0 (0.0)	0 (0.0)
Sep	---	---	3 (0.7)	3 (0.7)	2 (0.5)	3 (0.7)	1 (0.2)	2 (0.5)
Oct	---	---	6 (1.4)	4 (0.9)	4 (0.9)	6 (1.4)	-1 (-0.2)	2 (0.5)
Nov	---	---	4 (0.8)	3 (0.6)	0 (0.0)	4 (0.8)	1 (0.2)	4 (0.8)
Dec	---	---	3 (0.7)	3 (0.7)	3 (0.7)	3 (0.7)	-2 (-0.4)	-2 (-0.4)
Average	---	---	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	0 (0.0)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	27 (6.8)	32 (8.1)	33 (8.4)	31 (7.8)	33 (8.4)	28 (7.1)	23 (5.8)
Feb	---	-8 (-2.3)	-6 (-1.7)	-6 (-1.7)	-4 (-1.1)	-6 (-1.7)	-5 (-1.4)	-8 (-2.3)
Mar	---	-2 (-0.6)	-2 (-0.6)	-1 (-0.3)	1 (0.3)	-1 (-0.3)	2 (0.6)	-3 (-0.9)
Apr	---	12 (3.4)	11 (3.2)	12 (3.4)	12 (3.4)	12 (3.4)	13 (3.7)	8 (2.3)
May	---	-90 (-8.8)	-95 (-9.2)	-96 (-9.3)	-95 (-9.2)	-96 (-9.3)	-93 (-9.0)	-94 (-9.1)
Jun	---	-183 (-8.4)	-189 (-8.7)	-188 (-8.7)	-186 (-8.6)	-190 (-8.8)	-189 (-8.7)	-178 (-8.2)
Jul	---	-60 (-4.4)	-58 (-4.3)	-60 (-4.4)	-60 (-4.4)	-58 (-4.3)	-59 (-4.4)	-58 (-4.3)
Aug	---	-31 (-3.8)	-30 (-3.7)	-30 (-3.7)	-34 (-4.2)	-30 (-3.7)	-31 (-3.8)	-31 (-3.8)
Sep	---	-23 (-5.0)	-20 (-4.4)	-20 (-4.4)	-21 (-4.6)	-20 (-4.4)	-22 (-4.8)	-21 (-4.6)
Oct	---	8 (1.9)	14 (3.3)	12 (2.8)	12 (2.8)	14 (3.3)	7 (1.6)	10 (2.3)
Nov	---	27 (6.0)	31 (6.9)	30 (6.7)	27 (6.0)	31 (6.9)	28 (6.3)	31 (6.9)
Dec	---	44 (10.7)	47 (11.4)	47 (11.4)	47 (11.4)	47 (11.4)	42 (10.2)	42 (10.2)
Average	---	-24 (-3.4)	-22 (-3.1)	-23 (-3.2)	-23 (-3.2)	-22 (-3.1)	-24 (-3.4)	-24 (-3.4)

Table 67. Monthly Streamflow Normal Year (2005) – Arkansas River near Wellsville (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	294	284	284	284	284	284	284	284
Feb	261	252	253	252	253	253	253	253
Mar	258	257	258	257	256	258	259	260
Apr	263	261	262	262	262	262	267	262
May	957	921	920	920	919	920	921	919
Jun	1,533	1,527	1,518	1,520	1,520	1,522	1,536	1,527
Jul	932	900	901	902	902	900	901	901
Aug	601	571	569	570	569	568	569	570
Sep	292	311	315	316	309	316	315	313
Oct	427	402	405	405	403	403	402	400
Nov	412	497	505	506	500	506	495	501
Dec	409	565	566	567	568	567	562	566
Average	555	564	565	565	564	565	565	564

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	---		1	(0.4)	0	(0.0)	1	(0.4)	1	(0.4)	1	(0.4)	1	(0.4)
Mar	---	---		1	(0.4)	0	(0.0)	-1	(-0.4)	1	(0.4)	2	(0.8)	3	(1.2)
Apr	---	---		1	(0.4)	1	(0.4)	1	(0.4)	1	(0.4)	6	(2.3)	1	(0.4)
May	---	---		-1	(-0.1)	-1	(-0.1)	-2	(-0.2)	-1	(-0.1)	0	(0.0)	-2	(-0.2)
Jun	---	---		-9	(-0.6)	-7	(-0.5)	-7	(-0.5)	-5	(-0.3)	9	(0.6)	0	(0.0)
Jul	---	---		1	(0.1)	2	(0.2)	2	(0.2)	0	(0.0)	1	(0.1)	1	(0.1)
Aug	---	---		-2	(-0.4)	-1	(-0.2)	-2	(-0.4)	-3	(-0.5)	-2	(-0.4)	-1	(-0.2)
Sep	---	---		4	(1.3)	5	(1.6)	-2	(-0.6)	5	(1.6)	4	(1.3)	2	(0.6)
Oct	---	---		3	(0.7)	3	(0.7)	1	(0.2)	1	(0.2)	0	(0.0)	-2	(-0.5)
Nov	---	---		8	(1.6)	9	(1.8)	3	(0.6)	9	(1.8)	-2	(-0.4)	4	(0.8)
Dec	---	---		1	(0.2)	2	(0.4)	3	(0.5)	2	(0.4)	-3	(-0.5)	1	(0.2)
Average	---	---		1	(0.2)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.2)	0	(0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	-10	(-3.4)	-10	(-3.4)	-10	(-3.4)	-10	(-3.4)	-10	(-3.4)	-10	(-3.4)	-10	(-3.4)
Feb	---	-9	(-3.4)	-8	(-3.1)	-9	(-3.4)	-8	(-3.1)	-8	(-3.1)	-8	(-3.1)	-8	(-3.1)
Mar	---	-1	(-0.4)	0	(0.0)	-1	(-0.4)	-2	(-0.8)	0	(0.0)	1	(0.4)	2	(0.8)
Apr	---	-2	(-0.8)	-1	(-0.4)	-1	(-0.4)	-1	(-0.4)	-1	(-0.4)	4	(1.5)	-1	(-0.4)
May	---	-36	(-3.8)	-37	(-3.9)	-37	(-3.9)	-38	(-4.0)	-37	(-3.9)	-36	(-3.8)	-38	(-4.0)
Jun	---	-6	(-0.4)	-15	(-1.0)	-13	(-0.8)	-13	(-0.8)	-11	(-0.7)	3	(0.2)	-6	(-0.4)
Jul	---	-32	(-3.4)	-31	(-3.3)	-30	(-3.2)	-30	(-3.2)	-32	(-3.4)	-31	(-3.3)	-31	(-3.3)
Aug	---	-30	(-5.0)	-32	(-5.3)	-31	(-5.2)	-32	(-5.3)	-33	(-5.5)	-32	(-5.3)	-31	(-5.2)
Sep	---	19	(6.5)	23	(7.9)	24	(8.2)	17	(5.8)	24	(8.2)	23	(7.9)	21	(7.2)
Oct	---	-25	(-5.9)	-22	(-5.2)	-22	(-5.2)	-24	(-5.6)	-24	(-5.6)	-25	(-5.9)	-27	(-6.3)
Nov	---	85	(20.6)	93	(22.6)	94	(22.8)	88	(21.4)	94	(22.8)	83	(20.1)	89	(21.6)
Dec	---	156	(38.1)	157	(38.4)	158	(38.6)	159	(38.9)	158	(38.6)	153	(37.4)	157	(38.4)
Average	---	9	(1.6)	10	(1.8)	10	(1.8)	9	(1.6)	10	(1.8)	10	(1.8)	9	(1.6)

Table 68. Monthly Streamflow Wet Year (1997) – Arkansas River near Wellsville (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	402	562	555	548	544	550	544	533
Feb	307	298	296	296	296	296	296	296
Mar	333	387	389	386	386	386	388	387
Apr	512	394	357	361	382	361	354	384
May	1,375	1,165	1,143	1,149	1,162	1,144	1,155	1,147
Jun	3,775	3,410	3,434	3,436	3,434	3,441	3,432	3,479
Jul	1,706	1,668	1,667	1,665	1,667	1,665	1,667	1,668
Aug	1,113	1,035	1,032	1,032	1,035	1,032	1,033	1,035
Sep	559	486	487	488	487	487	488	487
Oct	510	482	481	482	482	482	481	482
Nov	523	565	571	571	568	571	570	570
Dec	492	483	482	482	483	482	482	482
Average	969	913	910	910	912	910	909	914
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-7 (-1.2)	-14 (-2.5)	-18 (-3.2)	-12 (-2.1)	-18 (-3.2)	-29 (-5.2)
Feb	---	---	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)
Mar	---	---	2 (0.5)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	1 (0.3)	0 (0.0)
Apr	---	---	-37 (-9.4)	-33 (-8.4)	-12 (-3.0)	-33 (-8.4)	-40 (-10.2)	-10 (-2.5)
May	---	---	-22 (-1.9)	-16 (-1.4)	-3 (-0.3)	-21 (-1.8)	-10 (-0.9)	-18 (-1.5)
Jun	---	---	24 (0.7)	26 (0.8)	24 (0.7)	31 (0.9)	22 (0.6)	69 (2.0)
Jul	---	---	-1 (-0.1)	-3 (-0.2)	-1 (-0.1)	-3 (-0.2)	-1 (-0.1)	0 (0.0)
Aug	---	---	-3 (-0.3)	-3 (-0.3)	0 (0.0)	-3 (-0.3)	-2 (-0.2)	0 (0.0)
Sep	---	---	1 (0.2)	2 (0.4)	1 (0.2)	1 (0.2)	2 (0.4)	1 (0.2)
Oct	---	---	-1 (-0.2)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.2)	0 (0.0)
Nov	---	---	6 (1.1)	6 (1.1)	3 (0.5)	6 (1.1)	5 (0.9)	5 (0.9)
Dec	---	---	-1 (-0.2)	-1 (-0.2)	0 (0.0)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)
Average	---	---	-3 (-0.3)	-3 (-0.3)	-1 (-0.1)	-3 (-0.3)	-4 (-0.4)	1 (0.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	160 (39.8)	153 (38.1)	146 (36.3)	142 (35.3)	148 (36.8)	142 (35.3)	131 (32.6)
Feb	---	-9 (-2.9)	-11 (-3.6)	-11 (-3.6)	-11 (-3.6)	-11 (-3.6)	-11 (-3.6)	-11 (-3.6)
Mar	---	54 (16.2)	56 (16.8)	53 (15.9)	53 (15.9)	53 (15.9)	55 (16.5)	54 (16.2)
Apr	---	-118 (-23.0)	-155 (-30.3)	-151 (-29.5)	-130 (-25.4)	-151 (-29.5)	-158 (-30.9)	-128 (-25.0)
May	---	-210 (-15.3)	-232 (-16.9)	-226 (-16.4)	-213 (-15.5)	-231 (-16.8)	-220 (-16.0)	-228 (-16.6)
Jun	---	-365 (-9.7)	-341 (-9.0)	-339 (-9.0)	-341 (-9.0)	-334 (-8.8)	-343 (-9.1)	-296 (-7.8)
Jul	---	-38 (-2.2)	-39 (-2.3)	-41 (-2.4)	-39 (-2.3)	-41 (-2.4)	-39 (-2.3)	-38 (-2.2)
Aug	---	-78 (-7.0)	-81 (-7.3)	-81 (-7.3)	-78 (-7.0)	-81 (-7.3)	-80 (-7.2)	-78 (-7.0)
Sep	---	-73 (-13.1)	-72 (-12.9)	-71 (-12.7)	-72 (-12.9)	-72 (-12.9)	-71 (-12.7)	-72 (-12.9)
Oct	---	-28 (-5.5)	-29 (-5.7)	-28 (-5.5)	-28 (-5.5)	-28 (-5.5)	-29 (-5.7)	-28 (-5.5)
Nov	---	42 (8.0)	48 (9.2)	48 (9.2)	45 (8.6)	48 (9.2)	47 (9.0)	47 (9.0)
Dec	---	-9 (-1.8)	-10 (-2.0)	-10 (-2.0)	-9 (-1.8)	-10 (-2.0)	-10 (-2.0)	-10 (-2.0)
Average	---	-56 (-5.8)	-59 (-6.1)	-59 (-6.1)	-57 (-5.9)	-59 (-6.1)	-60 (-6.2)	-55 (-5.7)

Table 69. Monthly Streamflow Dry Year (2004) – Arkansas River near Wellsville (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	252	252		252		252		252		252		252		252	
Feb	252	252		252		252		252		252		252		252	
Mar	251	253		259		259		253		259		257		254	
Apr	261	264		263		263		264		264		265		264	
May	753	643		650		651		644		653		656		648	
Jun	1,192	943		944		946		945		943		944		939	
Jul	815	800		801		800		801		801		803		801	
Aug	522	528		528		529		528		529		527		526	
Sep	294	373		381		380		377		381		373		378	
Oct	318	385		392		392		396		393		381		384	
Nov	338	423		420		420		426		421		413		417	
Dec	318	371		359		360		367		358		366		366	
Average	465	458		460		460		460		460		459		458	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---		6	(2.4)	6	(2.4)	0	(0.0)	6	(2.4)	4	(1.6)	1	(0.4)
Apr	---	---		-1	(-0.4)	-1	(-0.4)	0	(0.0)	0	(0.0)	1	(0.4)	0	(0.0)
May	---	---		7	(1.1)	8	(1.2)	1	(0.2)	10	(1.6)	13	(2.0)	5	(0.8)
Jun	---	---		1	(0.1)	3	(0.3)	2	(0.2)	0	(0.0)	1	(0.1)	-4	(-0.4)
Jul	---	---		1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	3	(0.4)	1	(0.1)
Aug	---	---		0	(0.0)	1	(0.2)	0	(0.0)	1	(0.2)	-1	(-0.2)	-2	(-0.4)
Sep	---	---		8	(2.1)	7	(1.9)	4	(1.1)	8	(2.1)	0	(0.0)	5	(1.3)
Oct	---	---		7	(1.8)	7	(1.8)	11	(2.9)	8	(2.1)	-4	(-1.0)	-1	(-0.3)
Nov	---	---		-3	(-0.7)	-3	(-0.7)	3	(0.7)	-2	(-0.5)	-10	(-2.4)	-6	(-1.4)
Dec	---	---		-12	(-3.2)	-11	(-3.0)	-4	(-1.1)	-13	(-3.5)	-5	(-1.3)	-5	(-1.3)
Average	---	---		2	(0.4)	2	(0.4)	2	(0.4)	2	(0.4)	1	(0.2)	0	(0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	2	(0.8)	8	(3.2)	8	(3.2)	2	(0.8)	8	(3.2)	6	(2.4)	3	(1.2)
Apr	---	3	(1.1)	2	(0.8)	2	(0.8)	3	(1.1)	3	(1.1)	4	(1.5)	3	(1.1)
May	---	-110	(-14.6)	-103	(-13.7)	-102	(-13.5)	-109	(-14.5)	-100	(-13.3)	-97	(-12.9)	-105	(-13.9)
Jun	---	-249	(-20.9)	-248	(-20.8)	-246	(-20.6)	-247	(-20.7)	-249	(-20.9)	-248	(-20.8)	-253	(-21.2)
Jul	---	-15	(-1.8)	-14	(-1.7)	-15	(-1.8)	-14	(-1.7)	-14	(-1.7)	-12	(-1.5)	-14	(-1.7)
Aug	---	6	(1.1)	6	(1.1)	7	(1.3)	6	(1.1)	7	(1.3)	5	(1.0)	4	(0.8)
Sep	---	79	(26.9)	87	(29.6)	86	(29.3)	83	(28.2)	87	(29.6)	79	(26.9)	84	(28.6)
Oct	---	67	(21.1)	74	(23.3)	74	(23.3)	78	(24.5)	75	(23.6)	63	(19.8)	66	(20.8)
Nov	---	85	(25.1)	82	(24.3)	82	(24.3)	88	(26.0)	83	(24.6)	75	(22.2)	79	(23.4)
Dec	---	53	(16.7)	41	(12.9)	42	(13.2)	49	(15.4)	40	(12.6)	48	(15.1)	48	(15.1)
Average	---	-7	(-1.5)	-5	(-1.1)	-5	(-1.1)	-5	(-1.1)	-5	(-1.1)	-6	(-1.3)	-7	(-1.5)

A time-series graph of mean daily streamflow for the typical wet year of 1997 in the direct effects analysis is presented in Figure 23. The slightly increased flows for the Joint Use Pipeline North Alternative and the slightly decreased flows for the other alternatives can be seen in the graph in January and April. A minor decrease in flow for the Joint Use Pipeline North can also be seen in June, but the high June flows make this a negligible effect.

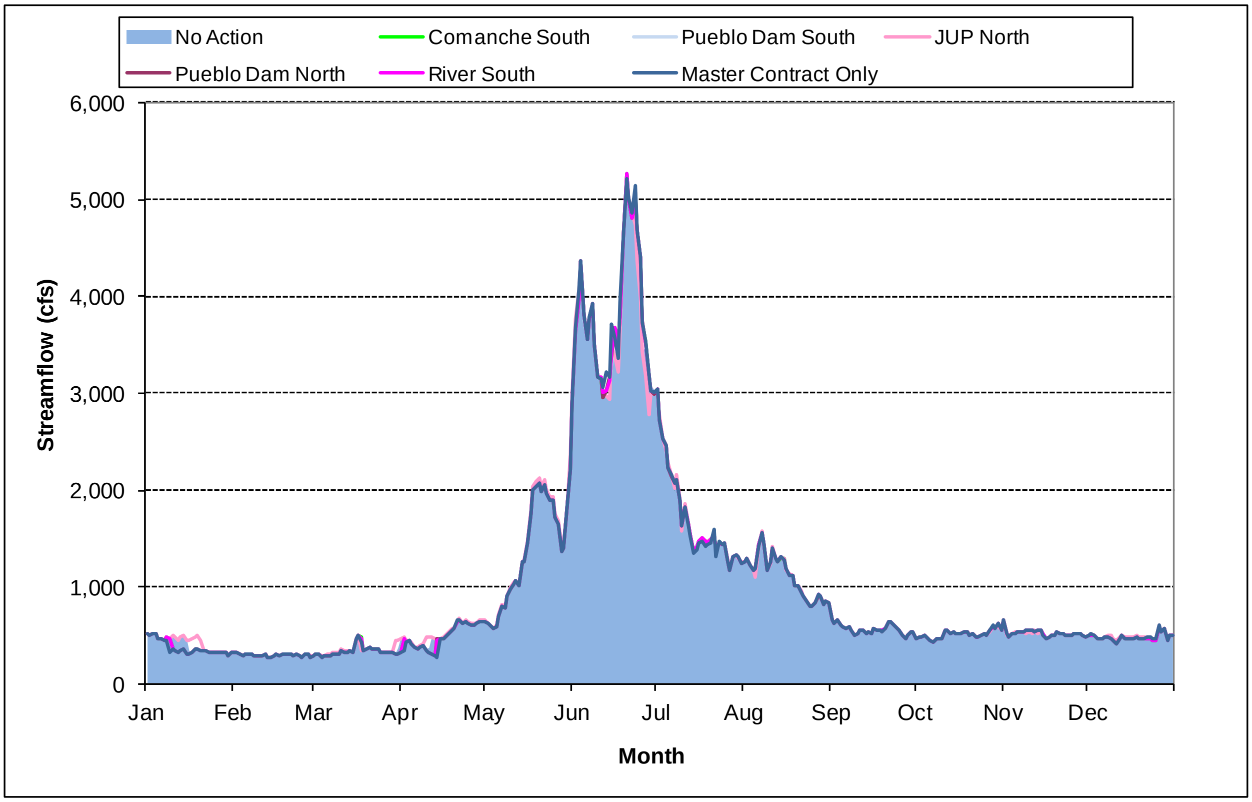

Figure 23. Mean Daily Streamflow – Typical Wet Year (1997), Arkansas River near Wellsville (Direct Effects).

Flow targets for the Upper Arkansas Voluntary Flow Management Program are administered at the Wellsville gage. In general, the flow targets establish an absolute minimum flow target of 250 cfs for fish habitat throughout the year, and a flow target of 700 cfs from July 1 through August 15 for recreational purposes. There are numerous other conditions of the Upper Arkansas Voluntary Flow Management Program that are discussed in more detail in the Daily Model documentation (MWH 2008a). Reclamation currently operates the Fry-Ark Project to meet the objectives of the Upper Arkansas Voluntary Flow Management Program, and as such, requests that all those with excess capacity contracts not exchange from Pueblo Reservoir against Reclamation releases. The model restricts all exchanges to the Upper Basin to comply with the Upper Arkansas Voluntary Flow Management Program, regardless of their source waters.

A summary of the percentage of time that the minimum fish habitat and recreational flows at Wellsville would be met for each alternative presented in Table 70. Overall, the direct effects of the alternatives would not change the amount of time that the target flows are met when compared with the No Action. Figure 24 shows a typical dry-year streamflow at the Wellsville gage (2004), along with the minimum flow targets. During extremely dry years, such as drought conditions in the early 2000s, the target recreational flows cannot always be met. However, the figure also shows that there would not be a substantial difference among alternatives in their ability to meet the target flows during dry years.

Table 70. Percent of Time Target Flows Met – Arkansas River near Wellsville (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Overall	95.1	95.3	95.3	95.4	95.4	95.3	95.3	95.1
Fish Habitat Flows	95.3	95.5	95.5	95.6	95.6	95.5	95.5	95.3
Recreational Flows	93.7	93.8	93.9	94.0	93.9	94.0	94.0	93.9

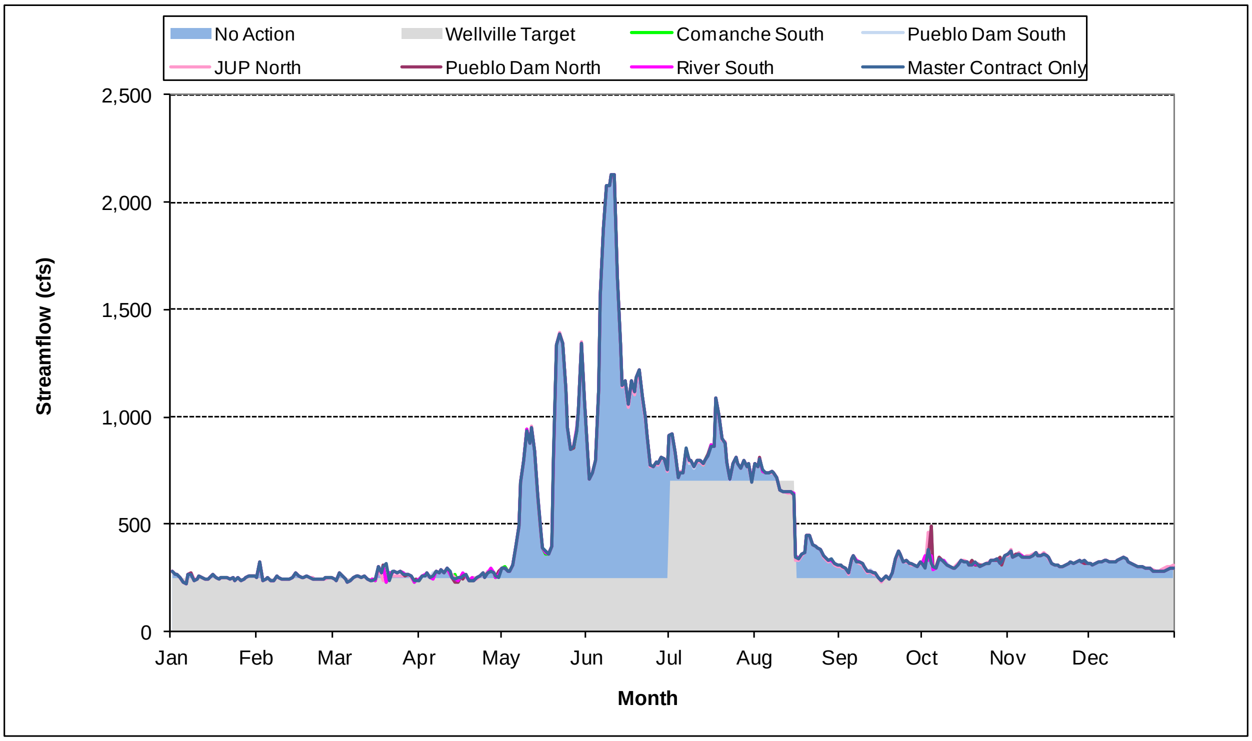

Figure 24. Mean Daily Streamflow Typical Dry Year (2004) – Arkansas River near Wellsville (Direct Effects).

A summary of the percentage of time that the minimum fish habitat and recreational flows at Wellsville would be met for each alternative presented in Table 71 for the cumulative effects analysis. In general, the alternatives would not change the amount of time that the target flows are met when compared with the No Action.

Table 71. Percent of Time Target Flows Met– Arkansas River near Wellsville (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Overall	95.1	95.0	95.0	95.1	95.0	95.0	95.1	95.0
Fish Habitat Flows	95.3	95.2	95.2	95.3	95.2	95.2	95.2	95.2
Recreational Flows	93.7	93.6	93.8	93.9	93.7	93.6	93.8	93.6

Lower Arkansas River Basin

The Lower Arkansas River Basin includes gages from below Pueblo Reservoir to the Las Animas gage. A summary of the average annual simulated streamflow for the direct effects analysis at several of the gages in the Lower Arkansas River Basin is presented in Table 72, while annual simulated streamflow for the cumulative effects analysis is presented in Table 73. Effects on flows in the Lower Basin would be negligible, except for the Above Pueblo gage (and Moffat St. gage for cumulative effects) where exchanges and flow routed through the AVC would result in minor effects. It should be noted that the model is less accurate under extreme low flow conditions (like 0 flow days) and thus averages during extreme dry years have a slightly greater degree of uncertainty.

Table 72. Mean Annual Streamflow – Lower Arkansas River Basin (Direct Effects).

	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Arkansas River Above Pueblo	646	627	611	611	614	611	625	624
Arkansas River At Moffat Street At Pueblo	637	619	606	606	609	606	606	616
Arkansas River Near Avondale	953	941	933	933	933	933	933	941
Arkansas River Near Nepesta	732	723	716	716	714	716	716	724
Arkansas River At Catlin Dam Near Fowler	727	719	713	713	711	713	713	721
Arkansas River Near Rocky Ford	495	502	500	499	496	500	500	505
Arkansas River At La Junta	302	307	307	307	303	307	308	310
Arkansas River At Las Animas	311	314	316	315	312	316	316	318
Effects (cfs) (Alternative – No Action Alternative)								
Arkansas River Above Pueblo	---	---	-16	-16	-13	-16	-2	-3
Arkansas River At Moffat Street At Pueblo	---	---	-13	-13	-10	-13	-13	-3
Arkansas River Near Avondale	---	---	-8	-8	-8	-8	-8	0
Arkansas River Near Nepesta	---	---	-7	-7	-9	-7	-7	1
Arkansas River At Catlin Dam Near Fowler	---	---	-6	-6	-8	-6	-6	2
Arkansas River Near Rocky Ford	---	---	-2	-3	-6	-2	-2	3
Arkansas River At La Junta	---	---	0	0	-4	0	1	3
Arkansas River At Las Animas	---	---	2	1	-2	2	2	4
Effects (%) (Alternative - No Action / No Action)								
Arkansas River Above Pueblo	---	---	-2.6	-2.6	-2.1	-2.6	-0.3	-0.5
Arkansas River At Moffat Street At Pueblo	---	---	-2.1	-2.1	-1.6	-2.1	-2.1	-0.5
Arkansas River Near Avondale	---	---	-0.9	-0.9	-0.9	-0.9	-0.9	0.0
Arkansas River Near Nepesta	---	---	-1.0	-1.0	-1.2	-1.0	-1.0	0.1
Arkansas River At Catlin Dam Near Fowler	---	---	-0.8	-0.8	-1.1	-0.8	-0.8	0.3
Arkansas River Near Rocky Ford	---	---	-0.4	-0.6	-1.2	-0.4	-0.4	0.6
Arkansas River At La Junta	---	---	0.0	0.0	-1.3	0.0	0.3	1.0
Arkansas River At Las Animas	---	---	0.6	0.3	-0.6	0.6	0.6	1.3

Table 73. Mean Annual Streamflow – Lower Arkansas River Basin (Cumulative Effects).

	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Arkansas River Above Pueblo	646	494	481	481	482	481	494	492
Arkansas River At Moffat Street At Pueblo	637	489	479	479	480	479	478	487
Arkansas River Near Avondale	953	923	915	915	915	915	914	922
Arkansas River Near Nepesta	732	685	679	679	678	679	678	685
Arkansas River At Catlin Dam Near Fowler	727	681	676	676	674	676	675	681
Arkansas River Near Rocky Ford	495	494	492	491	490	492	491	495
Arkansas River At La Junta	302	297	297	297	296	297	296	298
Arkansas River At Las Animas	311	305	306	306	304	306	305	306
Effects (cfs) (Alternative – No Action Alternative)								
Arkansas River Above Pueblo	---	---	-13	-13	-12	-13	0	-2
Arkansas River At Moffat Street At Pueblo	---	---	-10	-10	-9	-10	-11	-2
Arkansas River Near Avondale	---	---	-8	-8	-8	-8	-9	-1
Arkansas River Near Nepesta	---	---	-6	-6	-7	-6	-7	0
Arkansas River At Catlin Dam Near Fowler	---	---	-5	-5	-7	-5	-6	0
Arkansas River Near Rocky Ford	---	---	-2	-3	-4	-2	-3	1
Arkansas River At La Junta	---	---	0	0	-1	0	-1	1
Arkansas River At Las Animas	---	---	1	1	-1	1	0	1
Effects (cfs) (Alternative – No Action Alternative)								
Arkansas River Above Pueblo	---	---	-2.6	-2.6	-2.4	-2.6	0.0	-0.4
Arkansas River At Moffat Street At Pueblo	---	---	-2.0	-2.0	-1.8	-2.0	-2.2	-0.4
Arkansas River Near Avondale	---	---	-0.9	-0.9	-0.9	-0.9	-1.0	-0.1
Arkansas River Near Nepesta	---	---	-0.9	-0.9	-1.0	-0.9	-1.0	0.0
Arkansas River At Catlin Dam Near Fowler	---	---	-0.7	-0.7	-1.0	-0.7	-0.9	0.0
Arkansas River Near Rocky Ford	---	---	-0.4	-0.6	-0.8	-0.4	-0.6	0.2
Arkansas River At La Junta	---	---	0.0	0.0	-0.3	0.0	-0.3	0.3
Arkansas River At Las Animas	---	---	0.3	0.3	-0.3	0.3	0.0	0.3

Arkansas River above Pueblo

The Arkansas River above Pueblo gage is located immediately downstream of Pueblo Dam, upstream of the Pueblo Fish Hatchery releases. Total releases to the Arkansas River from Pueblo Dam for purposes of the Pueblo Flow Management Program are the sum of the Above Pueblo gage flows and the fish hatchery releases. Fish hatchery releases would not be affected by AVC alternatives.

Differences in flow between the AVC alternatives are very minor, with the greatest percentages occurring during the winter months when flows are lower. An explanation of the differences seen for each alternative is given below.

- The No Action Alternative has lower flows compared to existing conditions because of the higher simulated demands. More exchanges are made through this reach to Pueblo Reservoir to help meet the demands.

- The Comanche South, Pueblo Dam South and Pueblo Dam North alternatives show minor effects due to lower flows during the summer months caused by increased exchanges by Master Contract participants. These also show lower flows during the winter than the No Action Alternative because the No Action Alternative makes releases from Pueblo for augmentation purposes. Fall months show larger effects by percentage for these alternatives due to the lower flows in the river. Volumetrically, the reductions in flow are similar to that in late summer. In the typical dry year of 2004, these alternatives show moderate decreases in flow in the early spring months (Figure 26). Like the fall months, these effects by percentage are larger due to low river flows. Like the winter months, more releases are made by the No Action Alternative for augmentation at this time.

- The Joint Use Pipeline North Alternative shows lower flows during the winter than the No Action Alternative because the No Action Alternative makes releases from Pueblo for augmentation purposes. During the summer months, flows are lower due to exchanges. The effects are not as great as the other alternatives because there is no Master Contract simulated in this alternative, only if and when storage. In the typical dry year of 2004, this alternative shows moderate decreases in flow in March (Figure 26).

- The River South and Master Contract Alternative have mostly negligible effects, since the AVC is not routing flow around this reach, offsetting any exchange impacts.

Table 74. Overall Average Monthly Streamflow – Arkansas River Above Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	164	164	154	153	159	154	160	158
Feb	181	178	170	170	173	170	176	174
Mar	254	247	224	223	223	224	237	232
Apr	566	529	521	519	517	520	534	536
May	1,142	1,112	1,095	1,094	1,097	1,095	1,115	1,113
Jun	2,165	2,118	2,100	2,099	2,098	2,100	2,125	2,127
Jul	1,413	1,378	1,353	1,348	1,333	1,355	1,382	1,377
Aug	824	799	770	779	793	768	787	788
Sep	338	333	311	314	327	311	329	325
Oct	287	269	248	248	264	247	261	258
Nov	245	233	224	224	228	224	232	230
Dec	153	147	145	145	142	146	151	149
Average	646	627	611	611	614	611	625	624
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-10 (-6.1)	-11 (-6.7)	-5 (-3.0)	-10 (-6.1)	-4 (-2.4)	-6 (-3.7)
Feb	---	---	-8 (-4.5)	-8 (-4.5)	-5 (-2.8)	-8 (-4.5)	-2 (-1.1)	-4 (-2.2)
Mar	---	---	-23 (-9.3)	-24 (-9.7)	-24 (-9.7)	-23 (-9.3)	-10 (-4.0)	-15 (-6.1)
Apr	---	---	-8 (-1.5)	-10 (-1.9)	-12 (-2.3)	-9 (-1.7)	5 (0.9)	7 (1.3)
May	---	---	-17 (-1.5)	-18 (-1.6)	-15 (-1.3)	-17 (-1.5)	3 (0.3)	1 (0.1)
Jun	---	---	-18 (-0.8)	-19 (-0.9)	-20 (-0.9)	-18 (-0.8)	7 (0.3)	9 (0.4)
Jul	---	---	-25 (-1.8)	-30 (-2.2)	-45 (-3.3)	-23 (-1.7)	4 (0.3)	-1 (-0.1)
Aug	---	---	-29 (-3.6)	-20 (-2.5)	-6 (-0.8)	-31 (-3.9)	-12 (-1.5)	-11 (-1.4)
Sep	---	---	-22 (-6.6)	-19 (-5.7)	-6 (-1.8)	-22 (-6.6)	-4 (-1.2)	-8 (-2.4)
Oct	---	---	-21 (-7.8)	-21 (-7.8)	-5 (-1.9)	-22 (-8.2)	-8 (-3.0)	-11 (-4.1)
Nov	---	---	-9 (-3.9)	-9 (-3.9)	-5 (-2.1)	-9 (-3.9)	-1 (-0.4)	-3 (-1.3)
Dec	---	---	-2 (-1.4)	-2 (-1.4)	-5 (-3.4)	-1 (-0.7)	4 (2.7)	2 (1.4)
Average	---	---	-16 (-2.6)	-16 (-2.6)	-13 (-2.1)	-16 (-2.6)	-2 (-0.3)	-3 (-0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	-10 (-6.1)	-11 (-6.7)	-5 (-3.0)	-10 (-6.1)	-4 (-2.4)	-6 (-3.7)
Feb	---	-3 (-1.7)	-11 (-6.1)	-11 (-6.1)	-8 (-4.4)	-11 (-6.1)	-5 (-2.8)	-7 (-3.9)
Mar	---	-7 (-2.8)	-30 (-11.8)	-31 (-12.2)	-31 (-12.2)	-30 (-11.8)	-17 (-6.7)	-22 (-8.7)
Apr	---	-37 (-6.5)	-45 (-8.0)	-47 (-8.3)	-49 (-8.7)	-46 (-8.1)	-32 (-5.7)	-30 (-5.3)
May	---	-30 (-2.6)	-47 (-4.1)	-48 (-4.2)	-45 (-3.9)	-47 (-4.1)	-27 (-2.4)	-29 (-2.5)
Jun	---	-47 (-2.2)	-65 (-3.0)	-66 (-3.0)	-67 (-3.1)	-65 (-3.0)	-40 (-1.8)	-38 (-1.8)
Jul	---	-35 (-2.5)	-60 (-4.2)	-65 (-4.6)	-80 (-5.7)	-58 (-4.1)	-31 (-2.2)	-36 (-2.5)
Aug	---	-25 (-3.0)	-54 (-6.6)	-45 (-5.5)	-31 (-3.8)	-56 (-6.8)	-37 (-4.5)	-36 (-4.4)
Sep	---	-5 (-1.5)	-27 (-8.0)	-24 (-7.1)	-11 (-3.3)	-27 (-8.0)	-9 (-2.7)	-13 (-3.8)
Oct	---	-18 (-6.3)	-39 (-13.6)	-39 (-13.6)	-23 (-8.0)	-40 (-13.9)	-26 (-9.1)	-29 (-10.1)
Nov	---	-12 (-4.9)	-21 (-8.6)	-21 (-8.6)	-17 (-6.9)	-21 (-8.6)	-13 (-5.3)	-15 (-6.1)
Dec	---	-6 (-3.9)	-8 (-5.2)	-8 (-5.2)	-11 (-7.2)	-7 (-4.6)	-2 (-1.3)	-4 (-2.6)
Average	---	-19 (-2.9)	-35 (-5.4)	-35 (-5.4)	-32 (-5.0)	-35 (-5.4)	-20 (-3.1)	-22 (-3.4)

Table 75. Monthly Streamflow Normal Year (2005) – Arkansas River Above Pueblo (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	114	119	104	104	113	105	112	110
Feb	51	53	53	53	52	53	52	54
Mar	120	109	98	98	107	98	102	100
Apr	197	180	167	165	172	166	174	173
May	937	891	858	859	878	860	883	877
Jun	1,318	1,298	1,250	1,251	1,266	1,248	1,281	1,291
Jul	874	848	820	818	827	820	849	845
Aug	583	562	537	537	544	537	560	552
Sep	187	170	158	158	157	158	177	171
Oct	264	224	204	204	216	204	218	216
Nov	173	158	156	156	154	156	165	163
Dec	98	74	70	70	72	70	74	73
Average	412	393	375	375	382	375	389	387
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-15 (-12.6)	-15 (-12.6)	-6 (-5.0)	-14 (-11.8)	-7 (-5.9)	-9 (-7.6)
Feb	---	---	0 (0.0)	0 (0.0)	-1 (-1.9)	0 (0.0)	-1 (-1.9)	1 (1.9)
Mar	---	---	-11 (-10.1)	-11 (-10.1)	-2 (-1.8)	-11 (-10.1)	-7 (-6.4)	-9 (-8.3)
Apr	---	---	-13 (-7.2)	-15 (-8.3)	-8 (-4.4)	-14 (-7.8)	-6 (-3.3)	-7 (-3.9)
May	---	---	-33 (-3.7)	-32 (-3.6)	-13 (-1.5)	-31 (-3.5)	-8 (-0.9)	-14 (-1.6)
Jun	---	---	-48 (-3.7)	-47 (-3.6)	-32 (-2.5)	-50 (-3.9)	-17 (-1.3)	-7 (-0.5)
Jul	---	---	-28 (-3.3)	-30 (-3.5)	-21 (-2.5)	-28 (-3.3)	1 (0.1)	-3 (-0.4)
Aug	---	---	-25 (-4.4)	-25 (-4.4)	-18 (-3.2)	-25 (-4.4)	-2 (-0.4)	-10 (-1.8)
Sep	---	---	-12 (-7.1)	-12 (-7.1)	-13 (-7.6)	-12 (-7.1)	7 (4.1)	1 (0.6)
Oct	---	---	-20 (-8.9)	-20 (-8.9)	-8 (-3.6)	-20 (-8.9)	-6 (-2.7)	-8 (-3.6)
Nov	---	---	-2 (-1.3)	-2 (-1.3)	-4 (-2.5)	-2 (-1.3)	7 (4.4)	5 (3.2)
Dec	---	---	-4 (-5.4)	-4 (-5.4)	-2 (-2.7)	-4 (-5.4)	0 (0.0)	-1 (-1.4)
Average	---	---	-18 (-4.6)	-18 (-4.6)	-11 (-2.8)	-18 (-4.6)	-4 (-1.0)	-6 (-1.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	5 (4.4)	-10 (-8.8)	-10 (-8.8)	-1 (-0.9)	-9 (-7.9)	-2 (-1.8)	-4 (-3.5)
Feb	---	2 (3.9)	2 (3.9)	2 (3.9)	1 (2.0)	2 (3.9)	1 (2.0)	3 (5.9)
Mar	---	-11 (-9.2)	-22 (-18.3)	-22 (-18.3)	-13 (-10.8)	-22 (-18.3)	-18 (-15.0)	-20 (-16.7)
Apr	---	-17 (-8.6)	-30 (-15.2)	-32 (-16.2)	-25 (-12.7)	-31 (-15.7)	-23 (-11.7)	-24 (-12.2)
May	---	-46 (-4.9)	-79 (-8.4)	-78 (-8.3)	-59 (-6.3)	-77 (-8.2)	-54 (-5.8)	-60 (-6.4)
Jun	---	-20 (-1.5)	-68 (-5.2)	-67 (-5.1)	-52 (-3.9)	-70 (-5.3)	-37 (-2.8)	-27 (-2.0)
Jul	---	-26 (-3.0)	-54 (-6.2)	-56 (-6.4)	-47 (-5.4)	-54 (-6.2)	-25 (-2.9)	-29 (-3.3)
Aug	---	-21 (-3.6)	-46 (-7.9)	-46 (-7.9)	-39 (-6.7)	-46 (-7.9)	-23 (-3.9)	-31 (-5.3)
Sep	---	-17 (-9.1)	-29 (-15.5)	-29 (-15.5)	-30 (-16.0)	-29 (-15.5)	-10 (-5.3)	-16 (-8.6)
Oct	---	-40 (-15.2)	-60 (-22.7)	-60 (-22.7)	-48 (-18.2)	-60 (-22.7)	-46 (-17.4)	-48 (-18.2)
Nov	---	-15 (-8.7)	-17 (-9.8)	-17 (-9.8)	-19 (-11.0)	-17 (-9.8)	-8 (-4.6)	-10 (-5.8)
Dec	---	-24 (-24.5)	-28 (-28.6)	-28 (-28.6)	-26 (-26.5)	-28 (-28.6)	-24 (-24.5)	-25 (-25.5)
Average	---	-19 (-4.6)	-37 (-9.0)	-37 (-9.0)	-30 (-7.3)	-37 (-9.0)	-23 (-5.6)	-25 (-6.1)

Table 76. Monthly Streamflow Wet Year (1997) – Arkansas River Above Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	160	159	149	149	156	149	157	156
Feb	146	147	142	142	144	142	147	145
Mar	530	492	462	465	485	461	469	464
Apr	874	830	822	816	825	822	836	829
May	1,201	1,173	1,144	1,145	1,160	1,144	1,164	1,160
Jun	4,028	3,951	3,993	3,995	3,909	3,994	4,019	4,018
Jul	1,292	1,243	1,245	1,246	1,228	1,248	1,272	1,261
Aug	978	956	942	942	939	941	962	957
Sep	401	397	374	374	394	374	392	387
Oct	373	357	330	330	350	330	343	340
Nov	509	467	507	508	455	509	515	512
Dec	276	272	264	264	267	264	270	269
Average	897	870	864	865	859	865	879	875
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-10 (-6.3)	-10 (-6.3)	-3 (-1.9)	-10 (-6.3)	-2 (-1.3)	-3 (-1.9)
Feb	---	---	-5 (-3.4)	-5 (-3.4)	-3 (-2.0)	-5 (-3.4)	0 (0.0)	-2 (-1.4)
Mar	---	---	-30 (-6.1)	-27 (-5.5)	-7 (-1.4)	-31 (-6.3)	-23 (-4.7)	-28 (-5.7)
Apr	---	---	-8 (-1.0)	-14 (-1.7)	-5 (-0.6)	-8 (-1.0)	6 (0.7)	-1 (-0.1)
May	---	---	-29 (-2.5)	-28 (-2.4)	-13 (-1.1)	-29 (-2.5)	-9 (-0.8)	-13 (-1.1)
Jun	---	---	42 (1.1)	44 (1.1)	-42 (-1.1)	43 (1.1)	68 (1.7)	67 (1.7)
Jul	---	---	2 (0.2)	3 (0.2)	-15 (-1.2)	5 (0.4)	29 (2.3)	18 (1.4)
Aug	---	---	-14 (-1.5)	-14 (-1.5)	-17 (-1.8)	-15 (-1.6)	6 (0.6)	1 (0.1)
Sep	---	---	-23 (-5.8)	-23 (-5.8)	-3 (-0.8)	-23 (-5.8)	-5 (-1.3)	-10 (-2.5)
Oct	---	---	-27 (-7.6)	-27 (-7.6)	-7 (-2.0)	-27 (-7.6)	-14 (-3.9)	-17 (-4.8)
Nov	---	---	40 (8.6)	41 (8.8)	-12 (-2.6)	42 (9.0)	48 (10.3)	45 (9.6)
Dec	---	---	-8 (-2.9)	-8 (-2.9)	-5 (-1.8)	-8 (-2.9)	-2 (-0.7)	-3 (-1.1)
Average	---	---	-6 (-0.7)	-5 (-0.6)	-11 (-1.3)	-5 (-0.6)	9 (1.0)	5 (0.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-1 (-0.6)	-11 (-6.9)	-11 (-6.9)	-4 (-2.5)	-11 (-6.9)	-3 (-1.9)	-4 (-2.5)
Feb	---	1 (0.7)	-4 (-2.7)	-4 (-2.7)	-2 (-1.4)	-4 (-2.7)	1 (0.7)	-1 (-0.7)
Mar	---	-38 (-7.2)	-68 (-12.8)	-65 (-12.3)	-45 (-8.5)	-69 (-13.0)	-61 (-11.5)	-66 (-12.5)
Apr	---	-44 (-5.0)	-52 (-5.9)	-58 (-6.6)	-49 (-5.6)	-52 (-5.9)	-38 (-4.3)	-45 (-5.1)
May	---	-28 (-2.3)	-57 (-4.7)	-56 (-4.7)	-41 (-3.4)	-57 (-4.7)	-37 (-3.1)	-41 (-3.4)
Jun	---	-77 (-1.9)	-35 (-0.9)	-33 (-0.8)	-119 (-3.0)	-34 (-0.8)	-9 (-0.2)	-10 (-0.2)
Jul	---	-49 (-3.8)	-47 (-3.6)	-46 (-3.6)	-64 (-5.0)	-44 (-3.4)	-20 (-1.5)	-31 (-2.4)
Aug	---	-22 (-2.2)	-36 (-3.7)	-36 (-3.7)	-39 (-4.0)	-37 (-3.8)	-16 (-1.6)	-21 (-2.1)
Sep	---	-4 (-1.0)	-27 (-6.7)	-27 (-6.7)	-7 (-1.7)	-27 (-6.7)	-9 (-2.2)	-14 (-3.5)
Oct	---	-16 (-4.3)	-43 (-11.5)	-43 (-11.5)	-23 (-6.2)	-43 (-11.5)	-30 (-8.0)	-33 (-8.8)
Nov	---	-42 (-8.3)	-2 (-0.4)	-1 (-0.2)	-54 (-10.6)	0 (0.0)	6 (1.2)	3 (0.6)
Dec	---	-4 (-1.4)	-12 (-4.3)	-12 (-4.3)	-9 (-3.3)	-12 (-4.3)	-6 (-2.2)	-7 (-2.5)
Average	---	-27 (-3.0)	-33 (-3.7)	-32 (-3.6)	-38 (-4.2)	-32 (-3.6)	-18 (-2.0)	-22 (-2.5)

Table 77. Monthly Streamflow Dry Year (2004) – Arkansas River Above Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	110	107	100	100	104	100	103	102
Feb	153	150	132	132	143	132	140	141
Mar	171	156	112	110	121	114	142	131
Apr	339	273	241	241	265	243	261	258
May	826	831	801	800	793	802	827	819
Jun	1,119	1,070	1,053	1,058	1,056	1,054	1,102	1,071
Jul	624	603	585	587	588	585	611	601
Aug	321	312	300	300	301	301	320	312
Sep	114	107	102	102	98	100	113	109
Oct	172	177	162	163	167	163	165	172
Nov	163	152	144	144	147	142	147	146
Dec	134	127	120	120	120	120	129	127
Average	355	340	322	322	326	322	339	333
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-7 (-6.5)	-7 (-6.5)	-3 (-2.8)	-7 (-6.5)	-4 (-3.7)	-5 (-4.7)
Feb	---	---	-18 (-12.0)	-18 (-12.0)	-7 (-4.7)	-18 (-12.0)	-10 (-6.7)	-9 (-6.0)
Mar	---	---	-44 (-28.2)	-46 (-29.5)	-35 (-22.4)	-42 (-26.9)	-14 (-9.0)	-25 (-16.0)
Apr	---	---	-32 (-11.7)	-32 (-11.7)	-8 (-2.9)	-30 (-11.0)	-12 (-4.4)	-15 (-5.5)
May	---	---	-30 (-3.6)	-31 (-3.7)	-38 (-4.6)	-29 (-3.5)	-4 (-0.5)	-12 (-1.4)
Jun	---	---	-17 (-1.6)	-12 (-1.1)	-14 (-1.3)	-16 (-1.5)	32 (3.0)	1 (0.1)
Jul	---	---	-18 (-3.0)	-16 (-2.7)	-15 (-2.5)	-18 (-3.0)	8 (1.3)	-2 (-0.3)
Aug	---	---	-12 (-3.8)	-12 (-3.8)	-11 (-3.5)	-11 (-3.5)	8 (2.6)	0 (0.0)
Sep	---	---	-5 (-4.7)	-5 (-4.7)	-9 (-8.4)	-7 (-6.5)	6 (5.6)	2 (1.9)
Oct	---	---	-15 (-8.5)	-14 (-7.9)	-10 (-5.6)	-14 (-7.9)	-12 (-6.8)	-5 (-2.8)
Nov	---	---	-8 (-5.3)	-8 (-5.3)	-5 (-3.3)	-10 (-6.6)	-5 (-3.3)	-6 (-3.9)
Dec	---	---	-7 (-5.5)	-7 (-5.5)	-7 (-5.5)	-7 (-5.5)	2 (1.6)	0 (0.0)
Average	---	---	-18 (-5.3)	-18 (-5.3)	-14 (-4.1)	-18 (-5.3)	-1 (-0.3)	-7 (-2.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-3 (-2.7)	-10 (-9.1)	-10 (-9.1)	-6 (-5.5)	-10 (-9.1)	-7 (-6.4)	-8 (-7.3)
Feb	---	-3 (-2.0)	-21 (-13.7)	-21 (-13.7)	-10 (-6.5)	-21 (-13.7)	-13 (-8.5)	-12 (-7.8)
Mar	---	-15 (-8.8)	-59 (-34.5)	-61 (-35.7)	-50 (-29.2)	-57 (-33.3)	-29 (-17.0)	-40 (-23.4)
Apr	---	-66 (-19.5)	-98 (-28.9)	-98 (-28.9)	-74 (-21.8)	-96 (-28.3)	-78 (-23.0)	-81 (-23.9)
May	---	5 (0.6)	-25 (-3.0)	-26 (-3.1)	-33 (-4.0)	-24 (-2.9)	1 (0.1)	-7 (-0.8)
Jun	---	-49 (-4.4)	-66 (-5.9)	-61 (-5.5)	-63 (-5.6)	-65 (-5.8)	-17 (-1.5)	-48 (-4.3)
Jul	---	-21 (-3.4)	-39 (-6.3)	-37 (-5.9)	-36 (-5.8)	-39 (-6.3)	-13 (-2.1)	-23 (-3.7)
Aug	---	-9 (-2.8)	-21 (-6.5)	-21 (-6.5)	-20 (-6.2)	-20 (-6.2)	-1 (-0.3)	-9 (-2.8)
Sep	---	-7 (-6.1)	-12 (-10.5)	-12 (-10.5)	-16 (-14.0)	-14 (-12.3)	-1 (-0.9)	-5 (-4.4)
Oct	---	5 (2.9)	-10 (-5.8)	-9 (-5.2)	-5 (-2.9)	-9 (-5.2)	-7 (-4.1)	0 (0.0)
Nov	---	-11 (-6.7)	-19 (-11.7)	-19 (-11.7)	-16 (-9.8)	-21 (-12.9)	-16 (-9.8)	-17 (-10.4)
Dec	---	-7 (-5.2)	-14 (-10.4)	-14 (-10.4)	-14 (-10.4)	-14 (-10.4)	-5 (-3.7)	-7 (-5.2)
Average	---	-15 (-4.2)	-33 (-9.3)	-33 (-9.3)	-29 (-8.2)	-33 (-9.3)	-16 (-4.5)	-22 (-6.2)

A time-series graph of mean daily streamflow for the direct effects analysis is presented in Figure 25 and a graph of mean daily streamflow for the spring months of the typical dry year of 2004 is shown in Figure 26. The dry year difference is most evident immediately following the winter water season. Those alternatives without an AVC intake at Pueblo Reservoir show an increase in flows as releases from Pueblo are made. Those with the AVC intake at Pueblo Reservoir show a decrease in flows as exchanges are made into storage by municipal entities once the winter water season is over.

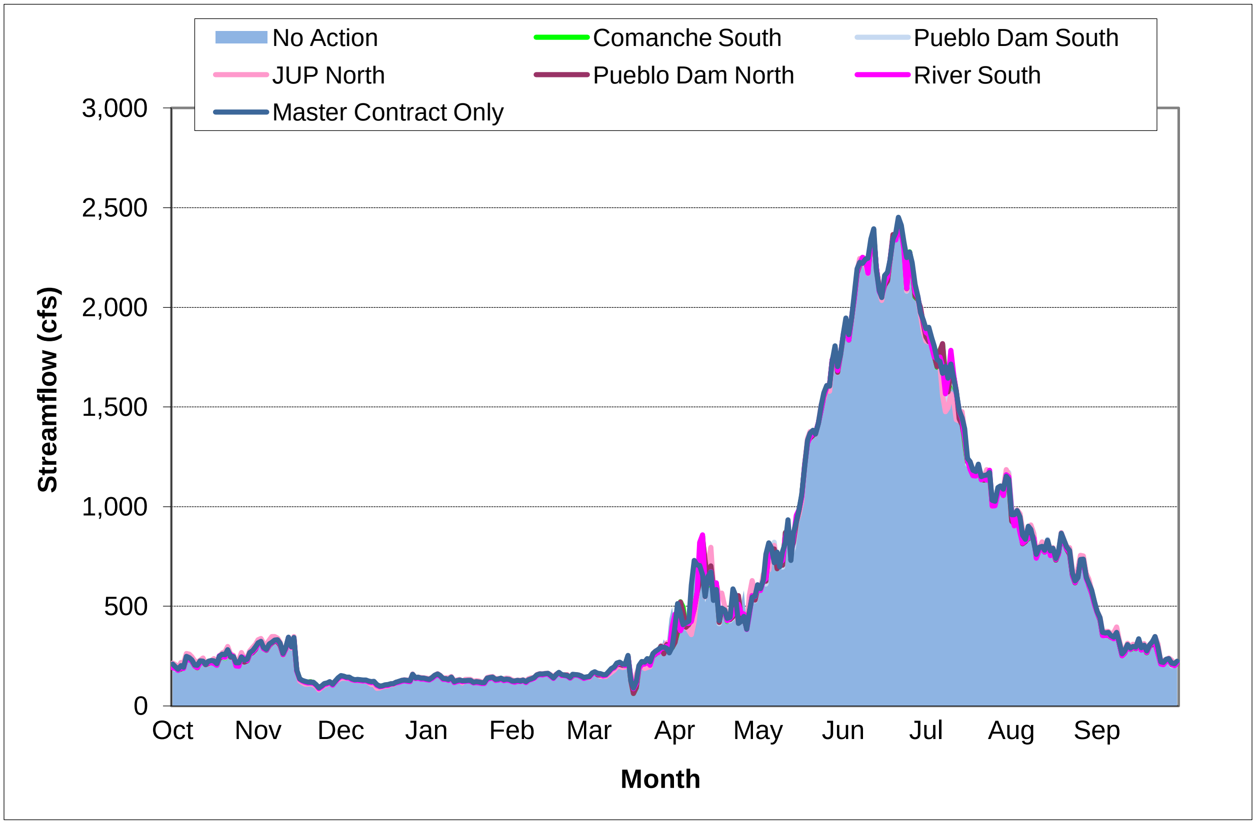

Figure 25. Mean Daily Streamflow – Overall Average, Arkansas River Above Pueblo (Direct Effects).

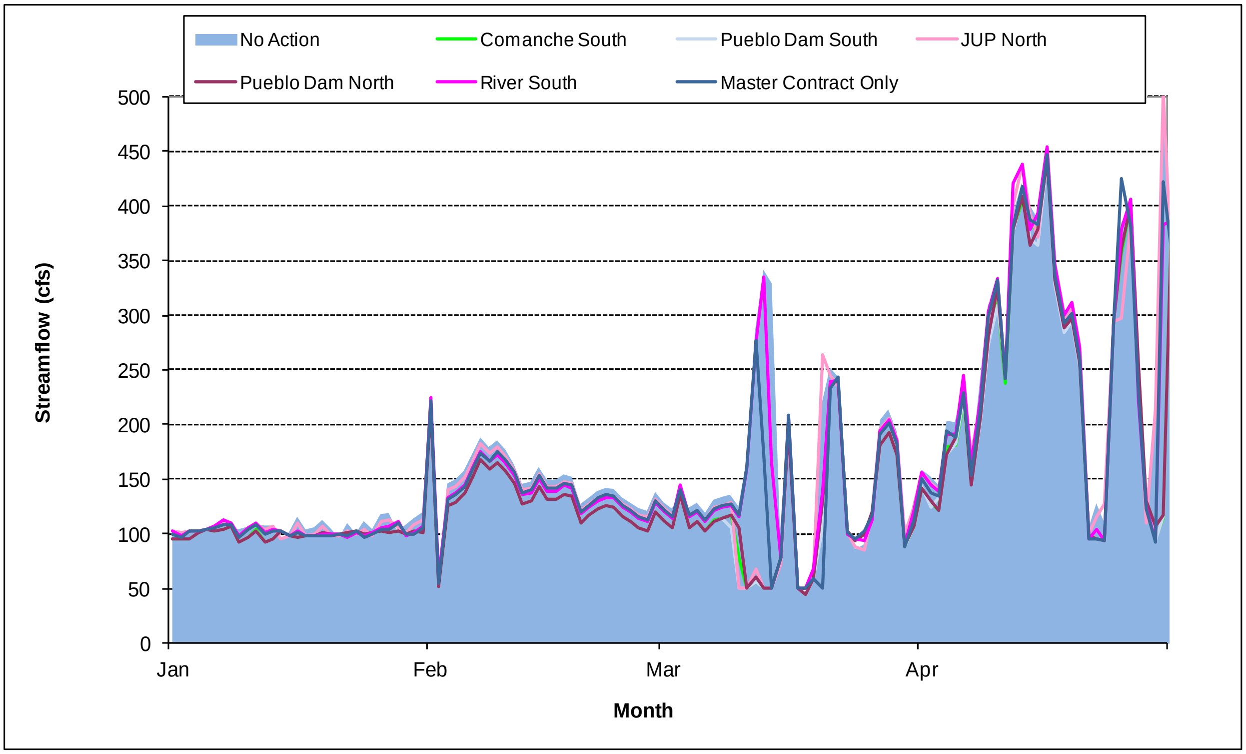

Figure 26. Typical Dry Year (2004) Spring Flows at Arkansas River Above Pueblo (Direct Effects).

The Pueblo Flow Management Program target flows would be administered at a point downstream of the Above Pueblo streamflow gage that includes releases through the Pueblo Fish Hatchery. A graph showing the mean daily streamflow and target flows during the typical dry year of 2004 is presented in Figure 27. A summary of the percent of time that the Pueblo Flow Management Program target flows would be met for each of the alternatives is presented in Table 78. The No Action Alternative would show an comparable amount of time that the Pueblo Flow Management Program target flows would be met in relation to existing conditions, and all alternatives except the River South and Master Contract Only alternatives would show a reduction in the amount of time that the target flows would be met in relation to the No Action. The River South Alternative has an increased percent of time flow targets would be met compared to the No Action. This alternative was designed to increase flows though this reach by having the AVC pipeline intake downstream of the measurement location. The Master Contract Only is very similar to the No Action Alternative. It should be noted that the target flows shown in Figure 27 show a continuous line at the maximum daily target flow rate. However, target flows vary by day of the week, and thus the target flow for individual days within the week vary from those flows shown in the figure.

Table 78. Percent of Time Target Flows Met – Arkansas River Above Pueblo at Pueblo Flow Management Program Measurement Location (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Overall	89.2%	89.3%	88.8%	88.5%	88.3%	88.8%	90.3%	89.4%
Non Winter Water Season	94.7%	95.4%	95.6%	95.5%	95.1%	95.6%	96.3%	95.5%
Winter Water Season	78.3%	77.0%	74.9%	74.6%	74.4%	75.0%	78.2%	77.0%

Notes:
(1) * Pueblo Flow Management Program included in alternative.
(2) Winter Water Season is November 15 through March 15.

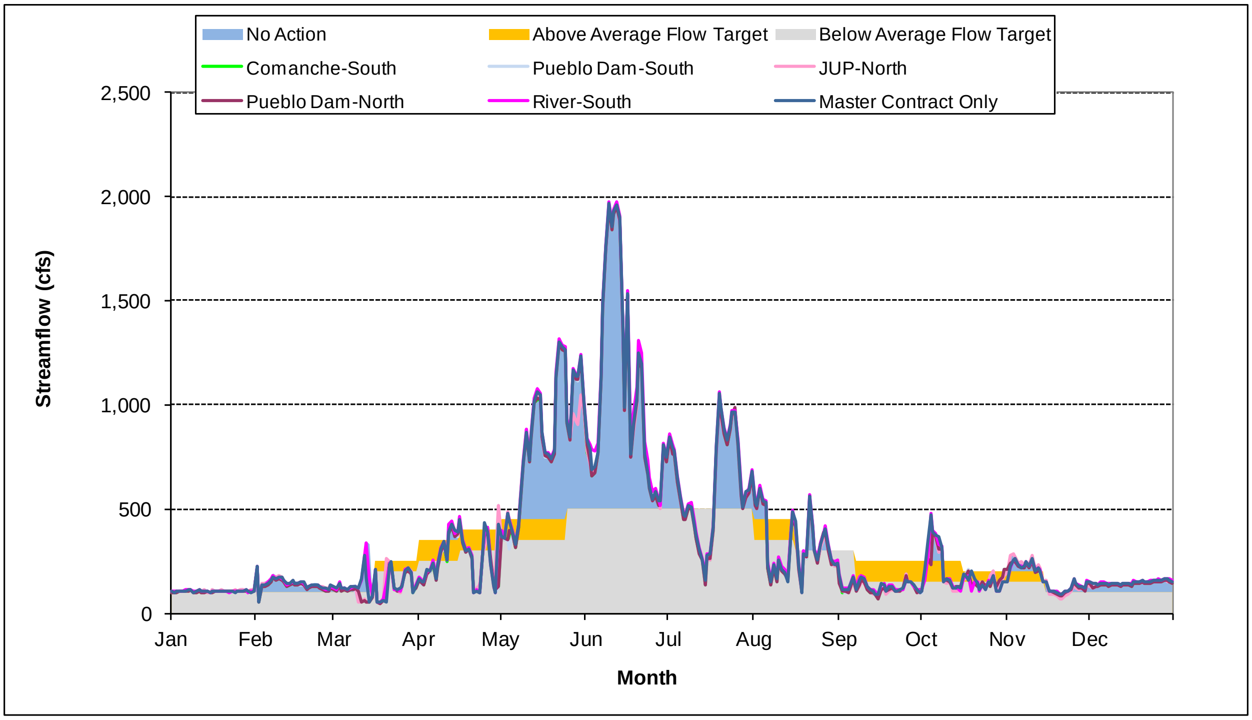

Figure 27. Mean Daily Streamflow Dry Year (2004) – Arkansas River above Pueblo (Direct Effects).

Mean monthly simulated streamflow for the cumulative effects analysis is presented in Table 79 through Table 83. All alternatives show negligible to minor decreases in flow during most months. The alternatives would show an overall reduction in the amount of time that the Pueblo Flow Management Program target flows would be met compared to the direct effects because of large exchanges and Pueblo Reservoir diversions of the larger municipalities. Target flows compared to No Action are the same as the direct effects with flows being met more frequently in the River South Alternative and similarly to No Action in the Master Contract Only Alternative.

Table 79. Overall Average Monthly Streamflow – Arkansas River Above Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche – South	Pueblo Dam – South	JUP – North	Pueblo Dam – North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	164	125	122	122	123	123	127	126
Feb	181	155	149	149	150	149	156	153
Mar	254	163	158	158	157	158	164	167
Apr	566	324	314	313	302	312	320	323
May	1,142	827	795	795	804	795	825	818
Jun	2,165	1,822	1,790	1,792	1,797	1,791	1,823	1,813
Jul	1,413	1,185	1,157	1,150	1,147	1,155	1,181	1,187
Aug	824	668	654	657	655	655	674	662
Sep	338	214	206	206	207	207	218	215
Oct	287	164	151	151	157	151	162	159
Nov	245	152	148	148	150	148	152	152
Dec	153	122	120	120	120	120	123	122
Average	646	494	481	481	482	481	494	492
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-3 (-2.4)	-3 (-2.4)	-2 (-1.6)	-2 (-1.6)	2 (1.6)	1 (0.8)
Feb	---	---	-6 (-3.9)	-6 (-3.9)	-5 (-3.2)	-6 (-3.9)	1 (0.6)	-2 (-1.3)
Mar	---	---	-5 (-3.1)	-5 (-3.1)	-6 (-3.7)	-5 (-3.1)	1 (0.6)	4 (2.5)
Apr	---	---	-10 (-3.1)	-11 (-3.4)	-22 (-6.8)	-12 (-3.7)	-4 (-1.2)	-1 (-0.3)
May	---	---	-32 (-3.9)	-32 (-3.9)	-23 (-2.8)	-32 (-3.9)	-2 (-0.2)	-9 (-1.1)
Jun	---	---	-32 (-1.8)	-30 (-1.6)	-25 (-1.4)	-31 (-1.7)	1 (0.1)	-9 (-0.5)
Jul	---	---	-28 (-2.4)	-35 (-3.0)	-38 (-3.2)	-30 (-2.5)	-4 (-0.3)	2 (0.2)
Aug	---	---	-14 (-2.1)	-11 (-1.6)	-13 (-1.9)	-13 (-1.9)	6 (0.9)	-6 (-0.9)
Sep	---	---	-8 (-3.7)	-8 (-3.7)	-7 (-3.3)	-7 (-3.3)	4 (1.9)	1 (0.5)
Oct	---	---	-13 (-7.9)	-13 (-7.9)	-7 (-4.3)	-13 (-7.9)	-2 (-1.2)	-5 (-3.0)
Nov	---	---	-4 (-2.6)	-4 (-2.6)	-2 (-1.3)	-4 (-2.6)	0 (0.0)	0 (0.0)
Dec	---	---	-2 (-1.6)	-2 (-1.6)	-2 (-1.6)	-2 (-1.6)	1 (0.8)	0 (0.0)
Average	---	---	-13 (-2.6)	-13 (-2.6)	-12 (-2.4)	-13 (-2.6)	0 (0.0)	-2 (-0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-39 (-23.8)	-42 (-25.6)	-42 (-25.6)	-41 (-25.0)	-41 (-25.0)	-37 (-22.6)	-38 (-23.2)
Feb	---	-26 (-14.4)	-32 (-17.7)	-32 (-17.7)	-31 (-17.1)	-32 (-17.7)	-25 (-13.8)	-28 (-15.5)
Mar	---	-91 (-35.8)	-96 (-37.8)	-96 (-37.8)	-97 (-38.2)	-96 (-37.8)	-90 (-35.4)	-87 (-34.3)
Apr	---	-242 (-42.8)	-252 (-44.5)	-253 (-44.7)	-264 (-46.6)	-254 (-44.9)	-246 (-43.5)	-243 (-42.9)
May	---	-315 (-27.6)	-347 (-30.4)	-347 (-30.4)	-338 (-29.6)	-347 (-30.4)	-317 (-27.8)	-324 (-28.4)
Jun	---	-343 (-15.8)	-375 (-17.3)	-373 (-17.2)	-368 (-17.0)	-374 (-17.3)	-342 (-15.8)	-352 (-16.3)
Jul	---	-228 (-16.1)	-256 (-18.1)	-263 (-18.6)	-266 (-18.8)	-258 (-18.3)	-232 (-16.4)	-226 (-16.0)
Aug	---	-156 (-18.9)	-170 (-20.6)	-167 (-20.3)	-169 (-20.5)	-169 (-20.5)	-150 (-18.2)	-162 (-19.7)
Sep	---	-124 (-36.7)	-132 (-39.1)	-132 (-39.1)	-131 (-38.8)	-131 (-38.8)	-120 (-35.5)	-123 (-36.4)
Oct	---	-123 (-42.9)	-136 (-47.4)	-136 (-47.4)	-130 (-45.3)	-136 (-47.4)	-125 (-43.6)	-128 (-44.6)
Nov	---	-93 (-38.0)	-97 (-39.6)	-97 (-39.6)	-95 (-38.8)	-97 (-39.6)	-93 (-38.0)	-93 (-38.0)
Dec	---	-31 (-20.3)	-33 (-21.6)	-33 (-21.6)	-33 (-21.6)	-33 (-21.6)	-30 (-19.6)	-31 (-20.3)
Average	---	-151 (-23.4)	-164 (-25.4)	-165 (-25.5)	-164 (-25.4)	-164 (-25.4)	-151 (-23.4)	-153 (-23.7)

Table 80. Monthly Streamflow Normal Year (2005) – Arkansas River Above Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche – South	Pueblo Dam – South	JUP – North	Pueblo Dam – North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	114	86	83	83	85	84	89	86
Feb	51	65	63	63	64	63	65	65
Mar	120	88	91	83	86	86	84	95
Apr	197	139	132	131	130	130	139	139
May	937	577	558	558	567	559	583	572
Jun	1,318	901	871	870	878	873	917	895
Jul	874	701	679	679	670	675	701	701
Aug	583	464	505	501	499	505	496	496
Sep	187	103	100	100	98	99	108	106
Oct	264	92	95	95	92	92	93	92
Nov	173	86	87	87	83	86	87	89
Dec	98	65	61	61	61	61	66	66
Average	412	282	279	277	278	278	287	285
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-3 (-3.5)	-3 (-3.5)	-1 (-1.2)	-2 (-2.3)	3 (3.5)	0 (0.0)
Feb	---	---	-2 (-3.1)	-2 (-3.1)	-1 (-1.5)	-2 (-3.1)	0 (0.0)	0 (0.0)
Mar	---	---	3 (3.4)	-5 (-5.7)	-2 (-2.3)	-2 (-2.3)	-4 (-4.5)	7 (8.0)
Apr	---	---	-7 (-5.0)	-8 (-5.8)	-9 (-6.5)	-9 (-6.5)	0 (0.0)	0 (0.0)
May	---	---	-19 (-3.3)	-19 (-3.3)	-10 (-1.7)	-18 (-3.1)	6 (1.0)	-5 (-0.9)
Jun	---	---	-30 (-3.3)	-31 (-3.4)	-23 (-2.6)	-28 (-3.1)	16 (1.8)	-6 (-0.7)
Jul	---	---	-22 (-3.1)	-22 (-3.1)	-31 (-4.4)	-26 (-3.7)	0 (0.0)	0 (0.0)
Aug	---	---	41 (8.8)	37 (8.0)	35 (7.5)	41 (8.8)	32 (6.9)	32 (6.9)
Sep	---	---	-3 (-2.9)	-3 (-2.9)	-5 (-4.9)	-4 (-3.9)	5 (4.9)	3 (2.9)
Oct	---	---	3 (3.3)	3 (3.3)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)
Nov	---	---	1 (1.2)	1 (1.2)	-3 (-3.5)	0 (0.0)	1 (1.2)	3 (3.5)
Dec	---	---	-4 (-6.2)	-4 (-6.2)	-4 (-6.2)	-4 (-6.2)	1 (1.5)	1 (1.5)
Average	---	---	-3 (-1.1)	-5 (-1.8)	-4 (-1.4)	-4 (-1.4)	5 (1.8)	3 (1.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-28 (-24.6)	-31 (-27.2)	-31 (-27.2)	-29 (-25.4)	-30 (-26.3)	-25 (-21.9)	-28 (-24.6)
Feb	---	14 (27.5)	12 (23.5)	12 (23.5)	13 (25.5)	12 (23.5)	14 (27.5)	14 (27.5)
Mar	---	-32 (-26.7)	-29 (-24.2)	-37 (-30.8)	-34 (-28.3)	-34 (-28.3)	-36 (-30.0)	-25 (-20.8)
Apr	---	-58 (-29.4)	-65 (-33.0)	-66 (-33.5)	-67 (-34.0)	-67 (-34.0)	-58 (-29.4)	-58 (-29.4)
May	---	-360 (-38.4)	-379 (-40.4)	-379 (-40.4)	-370 (-39.5)	-378 (-40.3)	-354 (-37.8)	-365 (-39.0)
Jun	---	-417 (-31.6)	-447 (-33.9)	-448 (-34.0)	-440 (-33.4)	-445 (-33.8)	-401 (-30.4)	-423 (-32.1)
Jul	---	-173 (-19.8)	-195 (-22.3)	-195 (-22.3)	-204 (-23.3)	-199 (-22.8)	-173 (-19.8)	-173 (-19.8)
Aug	---	-119 (-20.4)	-78 (-13.4)	-82 (-14.1)	-84 (-14.4)	-78 (-13.4)	-87 (-14.9)	-87 (-14.9)
Sep	---	-84 (-44.9)	-87 (-46.5)	-87 (-46.5)	-89 (-47.6)	-88 (-47.1)	-79 (-42.2)	-81 (-43.3)
Oct	---	-172 (-65.2)	-169 (-64.0)	-169 (-64.0)	-172 (-65.2)	-172 (-65.2)	-171 (-64.8)	-172 (-65.2)
Nov	---	-87 (-50.3)	-86 (-49.7)	-86 (-49.7)	-90 (-52.0)	-87 (-50.3)	-86 (-49.7)	-84 (-48.6)
Dec	---	-33 (-33.7)	-37 (-37.8)	-37 (-37.8)	-37 (-37.8)	-37 (-37.8)	-32 (-32.7)	-32 (-32.7)
Average	---	-130 (-31.6)	-133 (-32.3)	-135 (-32.8)	-134 (-32.5)	-134 (-32.5)	-125 (-30.3)	-127 (-30.8)

Table 81. Monthly Streamflow Wet Year (1997) – Arkansas River Above Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche – South	Pueblo Dam – South	JUP – North	Pueblo Dam – North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	160	122	115	115	115	115	122	117
Feb	146	92	86	87	88	86	92	89
Mar	530	298	295	296	293	294	302	308
Apr	874	402	399	402	395	398	408	406
May	1,201	941	894	898	917	890	947	926
Jun	4,028	3,868	3,861	3,870	3,867	3,872	3,895	3,855
Jul	1,292	1,094	1,083	1,080	1,078	1,080	1,106	1,114
Aug	978	807	803	803	796	805	820	828
Sep	401	182	174	170	173	179	182	178
Oct	373	138	142	142	137	141	139	141
Nov	509	407	370	374	404	373	397	392
Dec	276	237	231	231	234	231	236	235
Average	897	715	704	705	708	705	720	715
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-7 (-5.7)	-7 (-5.7)	-7 (-5.7)	-7 (-5.7)	0 (0.0)	-5 (-4.1)
Feb	---	---	-6 (-6.5)	-5 (-5.4)	-4 (-4.3)	-6 (-6.5)	0 (0.0)	-3 (-3.3)
Mar	---	---	-3 (-1.0)	-2 (-0.7)	-5 (-1.7)	-4 (-1.3)	4 (1.3)	10 (3.4)
Apr	---	---	-3 (-0.7)	0 (0.0)	-7 (-1.7)	-4 (-1.0)	6 (1.5)	4 (1.0)
May	---	---	-47 (-5.0)	-43 (-4.6)	-24 (-2.6)	-51 (-5.4)	6 (0.6)	-15 (-1.6)
Jun	---	---	-7 (-0.2)	2 (0.1)	-1 (0.0)	4 (0.1)	27 (0.7)	-13 (-0.3)
Jul	---	---	-11 (-1.0)	-14 (-1.3)	-16 (-1.5)	-14 (-1.3)	12 (1.1)	20 (1.8)
Aug	---	---	-4 (-0.5)	-4 (-0.5)	-11 (-1.4)	-2 (-0.2)	13 (1.6)	21 (2.6)
Sep	---	---	-8 (-4.4)	-12 (-6.6)	-9 (-4.9)	-3 (-1.6)	0 (0.0)	-4 (-2.2)
Oct	---	---	4 (2.9)	4 (2.9)	-1 (-0.7)	3 (2.2)	1 (0.7)	3 (2.2)
Nov	---	---	-37 (-9.1)	-33 (-8.1)	-3 (-0.7)	-34 (-8.4)	-10 (-2.5)	-15 (-3.7)
Dec	---	---	-6 (-2.5)	-6 (-2.5)	-3 (-1.3)	-6 (-2.5)	-1 (-0.4)	-2 (-0.8)
Average	---	---	-11 (-1.5)	-10 (-1.4)	-7 (-1.0)	-10 (-1.4)	5 (0.7)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-38 (-23.8)	-45 (-28.1)	-45 (-28.1)	-45 (-28.1)	-45 (-28.1)	-38 (-23.8)	-43 (-26.9)
Feb	---	-54 (-37.0)	-60 (-41.1)	-59 (-40.4)	-58 (-39.7)	-60 (-41.1)	-54 (-37.0)	-57 (-39.0)
Mar	---	-232 (-43.8)	-235 (-44.3)	-234 (-44.2)	-237 (-44.7)	-236 (-44.5)	-228 (-43.0)	-222 (-41.9)
Apr	---	-472 (-54.0)	-475 (-54.3)	-472 (-54.0)	-479 (-54.8)	-476 (-54.5)	-466 (-53.3)	-468 (-53.5)
May	---	-260 (-21.6)	-307 (-25.6)	-303 (-25.2)	-284 (-23.6)	-311 (-25.9)	-254 (-21.1)	-275 (-22.9)
Jun	---	-160 (-4.0)	-167 (-4.1)	-158 (-3.9)	-161 (-4.0)	-156 (-3.9)	-133 (-3.3)	-173 (-4.3)
Jul	---	-198 (-15.3)	-209 (-16.2)	-212 (-16.4)	-214 (-16.6)	-212 (-16.4)	-186 (-14.4)	-178 (-13.8)
Aug	---	-171 (-17.5)	-175 (-17.9)	-175 (-17.9)	-182 (-18.6)	-173 (-17.7)	-158 (-16.2)	-150 (-15.3)
Sep	---	-219 (-54.6)	-227 (-56.6)	-231 (-57.6)	-228 (-56.9)	-222 (-55.4)	-219 (-54.6)	-223 (-55.6)
Oct	---	-235 (-63.0)	-231 (-61.9)	-231 (-61.9)	-236 (-63.3)	-232 (-62.2)	-234 (-62.7)	-232 (-62.2)
Nov	---	-102 (-20.0)	-139 (-27.3)	-135 (-26.5)	-105 (-20.6)	-136 (-26.7)	-112 (-22.0)	-117 (-23.0)
Dec	---	-39 (-14.1)	-45 (-16.3)	-45 (-16.3)	-42 (-15.2)	-45 (-16.3)	-40 (-14.5)	-41 (-14.9)
Average	---	-182 (-20.3)	-193 (-21.5)	-192 (-21.4)	-189 (-21.1)	-192 (-21.4)	-177 (-19.7)	-182 (-20.3)

Table 82. Monthly Streamflow Dry Year (2004) – Arkansas River Above Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche – South	Pueblo Dam – South	JUP – North	Pueblo Dam – North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	110	96	95	95	95	95	97	96
Feb	153	99	96	96	97	96	101	99
Mar	171	91	98	98	87	98	103	108
Apr	339	192	189	190	186	190	195	189
May	826	294	267	268	278	269	295	275
Jun	1,119	607	582	584	597	588	608	598
Jul	624	443	419	418	431	418	433	438
Aug	321	216	213	211	211	212	221	216
Sep	114	87	79	78	81	79	83	83
Oct	172	127	112	112	120	112	121	122
Nov	163	101	95	95	98	95	99	98
Dec	134	86	85	86	86	85	89	86
Average	355	204	195	195	198	195	204	201
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-1.0)	-1 (-1.0)	-1 (-1.0)	-1 (-1.0)	1 (1.0)	0 (0.0)
Feb	---	---	-3 (-3.0)	-3 (-3.0)	-2 (-2.0)	-3 (-3.0)	2 (2.0)	0 (0.0)
Mar	---	---	7 (7.7)	7 (7.7)	-4 (-4.4)	7 (7.7)	12 (13.2)	17 (18.7)
Apr	---	---	-3 (-1.6)	-2 (-1.0)	-6 (-3.1)	-2 (-1.0)	3 (1.6)	-3 (-1.6)
May	---	---	-27 (-9.2)	-26 (-8.8)	-16 (-5.4)	-25 (-8.5)	1 (0.3)	-19 (-6.5)
Jun	---	---	-25 (-4.1)	-23 (-3.8)	-10 (-1.6)	-19 (-3.1)	1 (0.2)	-9 (-1.5)
Jul	---	---	-24 (-5.4)	-25 (-5.6)	-12 (-2.7)	-25 (-5.6)	-10 (-2.3)	-5 (-1.1)
Aug	---	---	-3 (-1.4)	-5 (-2.3)	-5 (-2.3)	-4 (-1.9)	5 (2.3)	0 (0.0)
Sep	---	---	-8 (-9.2)	-9 (-10.3)	-6 (-6.9)	-8 (-9.2)	-4 (-4.6)	-4 (-4.6)
Oct	---	---	-15 (-11.8)	-15 (-11.8)	-7 (-5.5)	-15 (-11.8)	-6 (-4.7)	-5 (-3.9)
Nov	---	---	-6 (-5.9)	-6 (-5.9)	-3 (-3.0)	-6 (-5.9)	-2 (-2.0)	-3 (-3.0)
Dec	---	---	-1 (-1.2)	0 (0.0)	0 (0.0)	-1 (-1.2)	3 (3.5)	0 (0.0)
Average	---	---	-9 (-4.4)	-9 (-4.4)	-6 (-2.9)	-9 (-4.4)	0 (0.0)	-3 (-1.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-14 (-12.7)	-15 (-13.6)	-15 (-13.6)	-15 (-13.6)	-15 (-13.6)	-13 (-11.8)	-14 (-12.7)
Feb	---	-54 (-35.3)	-57 (-37.3)	-57 (-37.3)	-56 (-36.6)	-57 (-37.3)	-52 (-34.0)	-54 (-35.3)
Mar	---	-80 (-46.8)	-73 (-42.7)	-73 (-42.7)	-84 (-49.1)	-73 (-42.7)	-68 (-39.8)	-63 (-36.8)
Apr	---	-147 (-43.4)	-150 (-44.2)	-149 (-44.0)	-153 (-45.1)	-149 (-44.0)	-144 (-42.5)	-150 (-44.2)
May	---	-532 (-64.4)	-559 (-67.7)	-558 (-67.6)	-548 (-66.3)	-557 (-67.4)	-531 (-64.3)	-551 (-66.7)
Jun	---	-512 (-45.8)	-537 (-48.0)	-535 (-47.8)	-522 (-46.6)	-531 (-47.5)	-511 (-45.7)	-521 (-46.6)
Jul	---	-181 (-29.0)	-205 (-32.9)	-206 (-33.0)	-193 (-30.9)	-206 (-33.0)	-191 (-30.6)	-186 (-29.8)
Aug	---	-105 (-32.7)	-108 (-33.6)	-110 (-34.3)	-110 (-34.3)	-109 (-34.0)	-100 (-31.2)	-105 (-32.7)
Sep	---	-27 (-23.7)	-35 (-30.7)	-36 (-31.6)	-33 (-28.9)	-35 (-30.7)	-31 (-27.2)	-31 (-27.2)
Oct	---	-45 (-26.2)	-60 (-34.9)	-60 (-34.9)	-52 (-30.2)	-60 (-34.9)	-51 (-29.7)	-50 (-29.1)
Nov	---	-62 (-38.0)	-68 (-41.7)	-68 (-41.7)	-65 (-39.9)	-68 (-41.7)	-64 (-39.3)	-65 (-39.9)
Dec	---	-48 (-35.8)	-49 (-36.6)	-48 (-35.8)	-48 (-35.8)	-49 (-36.6)	-45 (-33.6)	-48 (-35.8)
Average	---	-151 (-42.5)	-160 (-45.1)	-160 (-45.1)	-157 (-44.2)	-160 (-45.1)	-151 (-42.5)	-154 (-43.4)

Table 83. Percent of Time Target Flows Met– Arkansas River Above Pueblo at Pueblo Flow Management Program Measurement Location (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Overall	89.2%	88.6%	87.7%	87.6%	87.1%	87.7%	90.5%	88.9%
Non Winter Water Season	94.7%	93.9%	95.0%	94.9%	93.8%	95.1%	96.0%	94.5%
Winter Water Season	78.3%	78.0%	73.1%	73.0%	73.5%	72.8%	79.2%	77.6%

Notes:
(1) * Pueblo Flow Management Program included in alternative.
(2) Winter Water Season is November 15 through March 15.

Arkansas River at Moffat Street at Pueblo

The Moffat Street gage is located on the east side of the city of Pueblo and upstream from Fountain Creek. Mean monthly simulated streamflow at the Moffat Street gage is shown in Table 84 through Table 87 for direct effects. All alternatives show negligible to minor decreases in flow compared to the No Action during fall, winter, and spring months. Cumulative Effects are shown in Table 88 through Table 91. In general, flows are lower than direct effects due to greater exchanges by municipal entities needed to meet higher demands. Differences between alternatives are similar to direct effects.

Table 84. Overall Average Monthly Streamflow – Arkansas River at Moffat Street (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	139	139	132	131	137	132	129	134
Feb	153	150	145	145	147	145	143	147
Mar	231	225	204	202	203	204	208	209
Apr	552	516	511	510	508	510	510	523
May	1,153	1,124	1,111	1,110	1,112	1,111	1,112	1,124
Jun	2,210	2,164	2,151	2,150	2,149	2,151	2,152	2,173
Jul	1,437	1,404	1,384	1,378	1,364	1,386	1,388	1,403
Aug	817	793	769	777	792	767	765	782
Sep	318	314	297	299	312	296	296	306
Oct	260	242	225	225	242	225	225	232
Nov	224	213	207	206	210	207	206	210
Dec	131	126	126	126	123	126	124	128
Average	637	619	606	606	609	606	606	616
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-7 (-5.0)	-8 (-5.8)	-2 (-1.4)	-7 (-5.0)	-10 (-7.2)	-5 (-3.6)
Feb	---	---	-5 (-3.3)	-5 (-3.3)	-3 (-2.0)	-5 (-3.3)	-7 (-4.7)	-3 (-2.0)
Mar	---	---	-21 (-9.3)	-23 (-10.2)	-22 (-9.8)	-21 (-9.3)	-17 (-7.6)	-16 (-7.1)
Apr	---	---	-5 (-1.0)	-6 (-1.2)	-8 (-1.6)	-6 (-1.2)	-6 (-1.2)	7 (1.4)
May	---	---	-13 (-1.2)	-14 (-1.2)	-12 (-1.1)	-13 (-1.2)	-12 (-1.1)	0 (0.0)
Jun	---	---	-13 (-0.6)	-14 (-0.6)	-15 (-0.7)	-13 (-0.6)	-12 (-0.6)	9 (0.4)
Jul	---	---	-20 (-1.4)	-26 (-1.9)	-40 (-2.8)	-18 (-1.3)	-16 (-1.1)	-1 (-0.1)
Aug	---	---	-24 (-3.0)	-16 (-2.0)	-1 (-0.1)	-26 (-3.3)	-28 (-3.5)	-11 (-1.4)
Sep	---	---	-17 (-5.4)	-15 (-4.8)	-2 (-0.6)	-18 (-5.7)	-18 (-5.7)	-8 (-2.5)
Oct	---	---	-17 (-7.0)	-17 (-7.0)	0 (0.0)	-17 (-7.0)	-17 (-7.0)	-10 (-4.1)
Nov	---	---	-6 (-2.8)	-7 (-3.3)	-3 (-1.4)	-6 (-2.8)	-7 (-3.3)	-3 (-1.4)
Dec	---	---	0 (0.0)	0 (0.0)	-3 (-2.4)	0 (0.0)	-2 (-1.6)	2 (1.6)
Average	---	---	-13 (-2.1)	-13 (-2.1)	-10 (-1.6)	-13 (-2.1)	-13 (-2.1)	-3 (-0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	-7 (-5.0)	-8 (-5.8)	-2 (-1.4)	-7 (-5.0)	-10 (-7.2)	-5 (-3.6)
Feb	---	-3 (-2.0)	-8 (-5.2)	-8 (-5.2)	-6 (-3.9)	-8 (-5.2)	-10 (-6.5)	-6 (-3.9)
Mar	---	-6 (-2.6)	-27 (-11.7)	-29 (-12.6)	-28 (-12.1)	-27 (-11.7)	-23 (-10.0)	-22 (-9.5)
Apr	---	-36 (-6.5)	-41 (-7.4)	-42 (-7.6)	-44 (-8.0)	-42 (-7.6)	-42 (-7.6)	-29 (-5.3)
May	---	-29 (-2.5)	-42 (-3.6)	-43 (-3.7)	-41 (-3.6)	-42 (-3.6)	-41 (-3.6)	-29 (-2.5)
Jun	---	-46 (-2.1)	-59 (-2.7)	-60 (-2.7)	-61 (-2.8)	-59 (-2.7)	-58 (-2.6)	-37 (-1.7)
Jul	---	-33 (-2.3)	-53 (-3.7)	-59 (-4.1)	-73 (-5.1)	-51 (-3.5)	-49 (-3.4)	-34 (-2.4)
Aug	---	-24 (-2.9)	-48 (-5.9)	-40 (-4.9)	-25 (-3.1)	-50 (-6.1)	-52 (-6.4)	-35 (-4.3)
Sep	---	-4 (-1.3)	-21 (-6.6)	-19 (-6.0)	-6 (-1.9)	-22 (-6.9)	-22 (-6.9)	-12 (-3.8)
Oct	---	-18 (-6.9)	-35 (-13.5)	-35 (-13.5)	-18 (-6.9)	-35 (-13.5)	-35 (-13.5)	-28 (-10.8)
Nov	---	-11 (-4.9)	-17 (-7.6)	-18 (-8.0)	-14 (-6.3)	-17 (-7.6)	-18 (-8.0)	-14 (-6.3)
Dec	---	-5 (-3.8)	-5 (-3.8)	-5 (-3.8)	-8 (-6.1)	-5 (-3.8)	-7 (-5.3)	-3 (-2.3)
Average	---	-18 (-2.8)	-30 (-4.7)	-30 (-4.7)	-27 (-4.2)	-30 (-4.7)	-30 (-4.7)	-21 (-3.3)

Table 85. Monthly Streamflow Normal Year (2005) – Arkansas River at Moffat Street (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	196	173	164	162	170	164	156	166
Feb	1,029	988	959	958	978	960	966	974
Mar	1,358	1,340	1,298	1,298	1,313	1,295	1,305	1,333
Apr	842	818	795	793	802	796	799	815
May	558	538	518	518	525	518	519	529
Jun	179	163	155	155	155	155	155	164
Jul	261	221	205	205	217	205	206	213
Aug	172	159	159	159	156	159	159	164
Sep	97	75	73	73	75	73	69	73
Oct	102	109	96	96	105	97	96	100
Nov	35	38	43	41	41	43	32	41
Dec	123	111	99	99	110	99	96	99
Average	409	391	377	376	384	377	376	386
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-9 (-5.2)	-11 (-6.4)	-3 (-1.7)	-9 (-5.2)	-17 (-9.8)	-7 (-4.0)
Feb	---	---	-29 (-2.9)	-30 (-3.0)	-10 (-1.0)	-28 (-2.8)	-22 (-2.2)	-14 (-1.4)
Mar	---	---	-42 (-3.1)	-42 (-3.1)	-27 (-2.0)	-45 (-3.4)	-35 (-2.6)	-7 (-0.5)
Apr	---	---	-23 (-2.8)	-25 (-3.1)	-16 (-2.0)	-22 (-2.7)	-19 (-2.3)	-3 (-0.4)
May	---	---	-20 (-3.7)	-20 (-3.7)	-13 (-2.4)	-20 (-3.7)	-19 (-3.5)	-9 (-1.7)
Jun	---	---	-8 (-4.9)	-8 (-4.9)	-8 (-4.9)	-8 (-4.9)	-8 (-4.9)	1 (0.6)
Jul	---	---	-16 (-7.2)	-16 (-7.2)	-4 (-1.8)	-16 (-7.2)	-15 (-6.8)	-8 (-3.6)
Aug	---	---	0 (0.0)	0 (0.0)	-3 (-1.9)	0 (0.0)	0 (0.0)	5 (3.1)
Sep	---	---	-2 (-2.7)	-2 (-2.7)	0 (0.0)	-2 (-2.7)	-6 (-8.0)	-2 (-2.7)
Oct	---	---	-13 (-11.9)	-13 (-11.9)	-4 (-3.7)	-12 (-11.0)	-13 (-11.9)	-9 (-8.3)
Nov	---	---	5 (13.2)	3 (7.9)	3 (7.9)	5 (13.2)	-6 (-15.8)	3 (7.9)
Dec	---	---	-12 (-10.8)	-12 (-10.8)	-1 (-0.9)	-12 (-10.8)	-15 (-13.5)	-12 (-10.8)
Average	---	---	-14 (-3.6)	-15 (-3.8)	-7 (-1.8)	-14 (-3.6)	-15 (-3.8)	-5 (-1.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-23 (-11.7)	-32 (-16.3)	-34 (-17.3)	-26 (-13.3)	-32 (-16.3)	-40 (-20.4)	-30 (-15.3)
Feb	---	-41 (-4.0)	-70 (-6.8)	-71 (-6.9)	-51 (-5.0)	-69 (-6.7)	-63 (-6.1)	-55 (-5.3)
Mar	---	-18 (-1.3)	-60 (-4.4)	-60 (-4.4)	-45 (-3.3)	-63 (-4.6)	-53 (-3.9)	-25 (-1.8)
Apr	---	-24 (-2.9)	-47 (-5.6)	-49 (-5.8)	-40 (-4.8)	-46 (-5.5)	-43 (-5.1)	-27 (-3.2)
May	---	-20 (-3.6)	-40 (-7.2)	-40 (-7.2)	-33 (-5.9)	-40 (-7.2)	-39 (-7.0)	-29 (-5.2)
Jun	---	-16 (-8.9)	-24 (-13.4)	-24 (-13.4)	-24 (-13.4)	-24 (-13.4)	-24 (-13.4)	-15 (-8.4)
Jul	---	-40 (-15.3)	-56 (-21.5)	-56 (-21.5)	-44 (-16.9)	-56 (-21.5)	-55 (-21.1)	-48 (-18.4)
Aug	---	-13 (-7.6)	-13 (-7.6)	-13 (-7.6)	-16 (-9.3)	-13 (-7.6)	-13 (-7.6)	-8 (-4.7)
Sep	---	-22 (-22.7)	-24 (-24.7)	-24 (-24.7)	-22 (-22.7)	-24 (-24.7)	-28 (-28.9)	-24 (-24.7)
Oct	---	7 (6.9)	-6 (-5.9)	-6 (-5.9)	3 (2.9)	-5 (-4.9)	-6 (-5.9)	-2 (-2.0)
Nov	---	3 (8.6)	8 (22.9)	6 (17.1)	6 (17.1)	8 (22.9)	-3 (-8.6)	6 (17.1)
Dec	---	-12 (-9.8)	-24 (-19.5)	-24 (-19.5)	-13 (-10.6)	-24 (-19.5)	-27 (-22.0)	-24 (-19.5)
Average	---	-18 (-4.4)	-32 (-7.8)	-33 (-8.1)	-25 (-6.1)	-32 (-7.8)	-33 (-8.1)	-23 (-5.6)

Table 86. Monthly Streamflow Wet Year (1997) – Arkansas River at Moffat Street (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	827	787	782	777	785	783	782	786
Feb	1,300	1,273	1,248	1,249	1,265	1,248	1,248	1,259
Mar	4,154	4,078	4,126	4,128	4,043	4,126	4,128	4,145
Apr	1,226	1,180	1,186	1,187	1,170	1,189	1,187	1,197
May	1,015	994	984	984	981	983	984	995
Jun	421	418	400	400	420	399	399	409
Jul	373	357	335	335	354	334	335	341
Aug	554	515	555	556	505	557	555	558
Sep	314	311	305	305	308	305	302	307
Oct	157	156	149	149	155	149	148	153
Nov	160	162	159	159	161	159	156	160
Dec	585	543	515	517	538	514	513	514
Average	925	899	897	897	891	897	896	903
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-5 (-0.6)	-10 (-1.3)	-2 (-0.3)	-4 (-0.5)	-5 (-0.6)	-1 (-0.1)
Feb	---	---	-25 (-2.0)	-24 (-1.9)	-8 (-0.6)	-25 (-2.0)	-25 (-2.0)	-14 (-1.1)
Mar	---	---	48 (1.2)	50 (1.2)	-35 (-0.9)	48 (1.2)	50 (1.2)	67 (1.6)
Apr	---	---	6 (0.5)	7 (0.6)	-10 (-0.8)	9 (0.8)	7 (0.6)	17 (1.4)
May	---	---	-10 (-1.0)	-10 (-1.0)	-13 (-1.3)	-11 (-1.1)	-10 (-1.0)	1 (0.1)
Jun	---	---	-18 (-4.3)	-18 (-4.3)	2 (0.5)	-19 (-4.5)	-19 (-4.5)	-9 (-2.2)
Jul	---	---	-22 (-6.2)	-22 (-6.2)	-3 (-0.8)	-23 (-6.4)	-22 (-6.2)	-16 (-4.5)
Aug	---	---	40 (7.8)	41 (8.0)	-10 (-1.9)	42 (8.2)	40 (7.8)	43 (8.3)
Sep	---	---	-6 (-1.9)	-6 (-1.9)	-3 (-1.0)	-6 (-1.9)	-9 (-2.9)	-4 (-1.3)
Oct	---	---	-7 (-4.5)	-7 (-4.5)	-1 (-0.6)	-7 (-4.5)	-8 (-5.1)	-3 (-1.9)
Nov	---	---	-3 (-1.9)	-3 (-1.9)	-1 (-0.6)	-3 (-1.9)	-6 (-3.7)	-2 (-1.2)
Dec	---	---	-28 (-5.2)	-26 (-4.8)	-5 (-0.9)	-29 (-5.3)	-30 (-5.5)	-29 (-5.3)
Average	---	---	-2 (-0.2)	-2 (-0.2)	-8 (-0.9)	-2 (-0.2)	-3 (-0.3)	4 (0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-40 (-4.8)	-45 (-5.4)	-50 (-6.0)	-42 (-5.1)	-44 (-5.3)	-45 (-5.4)	-41 (-5.0)
Feb	---	-27 (-2.1)	-52 (-4.0)	-51 (-3.9)	-35 (-2.7)	-52 (-4.0)	-52 (-4.0)	-41 (-3.2)
Mar	---	-76 (-1.8)	-28 (-0.7)	-26 (-0.6)	-111 (-2.7)	-28 (-0.7)	-26 (-0.6)	-9 (-0.2)
Apr	---	-46 (-3.8)	-40 (-3.3)	-39 (-3.2)	-56 (-4.6)	-37 (-3.0)	-39 (-3.2)	-29 (-2.4)
May	---	-21 (-2.1)	-31 (-3.1)	-31 (-3.1)	-34 (-3.3)	-32 (-3.2)	-31 (-3.1)	-20 (-2.0)
Jun	---	-3 (-0.7)	-21 (-5.0)	-21 (-5.0)	-1 (-0.2)	-22 (-5.2)	-22 (-5.2)	-12 (-2.9)
Jul	---	-16 (-4.3)	-38 (-10.2)	-38 (-10.2)	-19 (-5.1)	-39 (-10.5)	-38 (-10.2)	-32 (-8.6)
Aug	---	-39 (-7.0)	1 (0.2)	2 (0.4)	-49 (-8.8)	3 (0.5)	1 (0.2)	4 (0.7)
Sep	---	-3 (-1.0)	-9 (-2.9)	-9 (-2.9)	-6 (-1.9)	-9 (-2.9)	-12 (-3.8)	-7 (-2.2)
Oct	---	-1 (-0.6)	-8 (-5.1)	-8 (-5.1)	-2 (-1.3)	-8 (-5.1)	-9 (-5.7)	-4 (-2.5)
Nov	---	2 (1.3)	-1 (-0.6)	-1 (-0.6)	1 (0.6)	-1 (-0.6)	-4 (-2.5)	0 (0.0)
Dec	---	-42 (-7.2)	-70 (-12.0)	-68 (-11.6)	-47 (-8.0)	-71 (-12.1)	-72 (-12.3)	-71 (-12.1)
Average	---	-26 (-2.8)	-28 (-3.0)	-28 (-3.0)	-34 (-3.7)	-28 (-3.0)	-29 (-3.1)	-22 (-2.4)

Table 87. Monthly Streamflow Dry Year (2004) – Arkansas River at Moffat Street (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	319	255	226	225	252	227	234	241
Feb	794	801	778	777	765	779	782	789
Mar	1,097	1,049	1,037	1,042	1,039	1,038	1,062	1,050
Apr	586	569	556	557	560	556	556	567
May	295	286	280	279	280	280	278	286
Jun	77	71	70	70	67	69	64	74
Jul	128	134	122	123	128	123	112	129
Aug	158	148	142	142	144	141	137	142
Sep	113	107	101	101	102	101	103	106
Oct	61	59	54	54	58	54	48	53
Nov	100	97	81	81	93	81	81	88
Dec	132	117	76	74	85	77	97	92
Average	319	305	291	291	295	291	293	298
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-29 (-11.4)	-30 (-11.8)	-3 (-1.2)	-28 (-11.0)	-21 (-8.2)	-14 (-5.5)
Feb	---	---	-23 (-2.9)	-24 (-3.0)	-36 (-4.5)	-22 (-2.7)	-19 (-2.4)	-12 (-1.5)
Mar	---	---	-12 (-1.1)	-7 (-0.7)	-10 (-1.0)	-11 (-1.0)	13 (1.2)	1 (0.1)
Apr	---	---	-13 (-2.3)	-12 (-2.1)	-9 (-1.6)	-13 (-2.3)	-13 (-2.3)	-2 (-0.4)
May	---	---	-6 (-2.1)	-7 (-2.4)	-6 (-2.1)	-6 (-2.1)	-8 (-2.8)	0 (0.0)
Jun	---	---	-1 (-1.4)	-1 (-1.4)	-4 (-5.6)	-2 (-2.8)	-7 (-9.9)	3 (4.2)
Jul	---	---	-12 (-9.0)	-11 (-8.2)	-6 (-4.5)	-11 (-8.2)	-22 (-16.4)	-5 (-3.7)
Aug	---	---	-6 (-4.1)	-6 (-4.1)	-4 (-2.7)	-7 (-4.7)	-11 (-7.4)	-6 (-4.1)
Sep	---	---	-6 (-5.6)	-6 (-5.6)	-5 (-4.7)	-6 (-5.6)	-4 (-3.7)	-1 (-0.9)
Oct	---	---	-5 (-8.5)	-5 (-8.5)	-1 (-1.7)	-5 (-8.5)	-11 (-18.6)	-6 (-10.2)
Nov	---	---	-16 (-16.5)	-16 (-16.5)	-4 (-4.1)	-16 (-16.5)	-16 (-16.5)	-9 (-9.3)
Dec	---	---	-41 (-35.0)	-43 (-36.8)	-32 (-27.4)	-40 (-34.2)	-20 (-17.1)	-25 (-21.4)
Average	---	---	-14 (-4.6)	-14 (-4.6)	-10 (-3.3)	-14 (-4.6)	-12 (-3.9)	-7 (-2.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-64 (-20.1)	-93 (-29.2)	-94 (-29.5)	-67 (-21.0)	-92 (-28.8)	-85 (-26.6)	-78 (-24.5)
Feb	---	7 (0.9)	-16 (-2.0)	-17 (-2.1)	-29 (-3.7)	-15 (-1.9)	-12 (-1.5)	-5 (-0.6)
Mar	---	-48 (-4.4)	-60 (-5.5)	-55 (-5.0)	-58 (-5.3)	-59 (-5.4)	-35 (-3.2)	-47 (-4.3)
Apr	---	-17 (-2.9)	-30 (-5.1)	-29 (-4.9)	-26 (-4.4)	-30 (-5.1)	-30 (-5.1)	-19 (-3.2)
May	---	-9 (-3.1)	-15 (-5.1)	-16 (-5.4)	-15 (-5.1)	-15 (-5.1)	-17 (-5.8)	-9 (-3.1)
Jun	---	-6 (-7.8)	-7 (-9.1)	-7 (-9.1)	-10 (-13.0)	-8 (-10.4)	-13 (-16.9)	-3 (-3.9)
Jul	---	6 (4.7)	-6 (-4.7)	-5 (-3.9)	0 (0.0)	-5 (-3.9)	-16 (-12.5)	1 (0.8)
Aug	---	-10 (-6.3)	-16 (-10.1)	-16 (-10.1)	-14 (-8.9)	-17 (-10.8)	-21 (-13.3)	-16 (-10.1)
Sep	---	-6 (-5.3)	-12 (-10.6)	-12 (-10.6)	-11 (-9.7)	-12 (-10.6)	-10 (-8.8)	-7 (-6.2)
Oct	---	-2 (-3.3)	-7 (-11.5)	-7 (-11.5)	-3 (-4.9)	-7 (-11.5)	-13 (-21.3)	-8 (-13.1)
Nov	---	-3 (-3.0)	-19 (-19.0)	-19 (-19.0)	-7 (-7.0)	-19 (-19.0)	-19 (-19.0)	-12 (-12.0)
Dec	---	-15 (-11.4)	-56 (-42.4)	-58 (-43.9)	-47 (-35.6)	-55 (-41.7)	-35 (-26.5)	-40 (-30.3)
Average	---	-14 (-4.4)	-28 (-8.8)	-28 (-8.8)	-24 (-7.5)	-28 (-8.8)	-26 (-8.2)	-21 (-6.6)

Table 88. Overall Average Monthly Streamflow – Arkansas River at Moffat Street (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	139	102	101	101	102	101	97	102
Feb	153	130	126	126	127	126	125	128
Mar	231	141	138	138	137	138	136	145
Apr	552	314	308	306	296	305	299	313
May	1,153	842	814	815	823	815	826	833
Jun	2,210	1,873	1,846	1,848	1,853	1,847	1,856	1,864
Jul	1,437	1,215	1,192	1,185	1,182	1,190	1,191	1,217
Aug	817	666	656	659	658	657	655	660
Sep	318	199	195	195	195	195	188	199
Oct	260	140	131	130	137	131	128	135
Nov	224	134	132	133	135	132	128	134
Dec	131	101	101	101	101	101	96	102
Average	637	489	479	479	480	479	478	487
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-1.0)	-1 (-1.0)	0 (0.0)	-1 (-1.0)	-5 (-4.9)	0 (0.0)
Feb	---	---	-4 (-3.1)	-4 (-3.1)	-3 (-2.3)	-4 (-3.1)	-5 (-3.8)	-2 (-1.5)
Mar	---	---	-3 (-2.1)	-3 (-2.1)	-4 (-2.8)	-3 (-2.1)	-5 (-3.5)	4 (2.8)
Apr	---	---	-6 (-1.9)	-8 (-2.5)	-18 (-5.7)	-9 (-2.9)	-15 (-4.8)	-1 (-0.3)
May	---	---	-28 (-3.3)	-27 (-3.2)	-19 (-2.3)	-27 (-3.2)	-16 (-1.9)	-9 (-1.1)
Jun	---	---	-27 (-1.4)	-25 (-1.3)	-20 (-1.1)	-26 (-1.4)	-17 (-0.9)	-9 (-0.5)
Jul	---	---	-23 (-1.9)	-30 (-2.5)	-33 (-2.7)	-25 (-2.1)	-24 (-2.0)	2 (0.2)
Aug	---	---	-10 (-1.5)	-7 (-1.1)	-8 (-1.2)	-9 (-1.4)	-11 (-1.7)	-6 (-0.9)
Sep	---	---	-4 (-2.0)	-4 (-2.0)	-4 (-2.0)	-4 (-2.0)	-11 (-5.5)	0 (0.0)
Oct	---	---	-9 (-6.4)	-10 (-7.1)	-3 (-2.1)	-9 (-6.4)	-12 (-8.6)	-5 (-3.6)
Nov	---	---	-2 (-1.5)	-1 (-0.7)	1 (0.7)	-2 (-1.5)	-6 (-4.5)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-5 (-5.0)	1 (1.0)
Average	---	---	-10 (-2.0)	-10 (-2.0)	-9 (-1.8)	-10 (-2.0)	-11 (-2.2)	-2 (-0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-37 (-26.6)	-38 (-27.3)	-38 (-27.3)	-37 (-26.6)	-38 (-27.3)	-42 (-30.2)	-37 (-26.6)
Feb	---	-23 (-15.0)	-27 (-17.6)	-27 (-17.6)	-26 (-17.0)	-27 (-17.6)	-28 (-18.3)	-25 (-16.3)
Mar	---	-90 (-39.0)	-93 (-40.3)	-93 (-40.3)	-94 (-40.7)	-93 (-40.3)	-95 (-41.1)	-86 (-37.2)
Apr	---	-238 (-43.1)	-244 (-44.2)	-246 (-44.6)	-256 (-46.4)	-247 (-44.7)	-253 (-45.8)	-239 (-43.3)
May	---	-311 (-27.0)	-339 (-29.4)	-338 (-29.3)	-330 (-28.6)	-338 (-29.3)	-327 (-28.4)	-320 (-27.8)
Jun	---	-337 (-15.2)	-364 (-16.5)	-362 (-16.4)	-357 (-16.2)	-363 (-16.4)	-354 (-16.0)	-346 (-15.7)
Jul	---	-222 (-15.4)	-245 (-17.0)	-252 (-17.5)	-255 (-17.7)	-247 (-17.2)	-246 (-17.1)	-220 (-15.3)
Aug	---	-151 (-18.5)	-161 (-19.7)	-158 (-19.3)	-159 (-19.5)	-160 (-19.6)	-162 (-19.8)	-157 (-19.2)
Sep	---	-119 (-37.4)	-123 (-38.7)	-123 (-38.7)	-123 (-38.7)	-123 (-38.7)	-130 (-40.9)	-119 (-37.4)
Oct	---	-120 (-46.2)	-129 (-49.6)	-130 (-50.0)	-123 (-47.3)	-129 (-49.6)	-132 (-50.8)	-125 (-48.1)
Nov	---	-90 (-40.2)	-92 (-41.1)	-91 (-40.6)	-89 (-39.7)	-92 (-41.1)	-96 (-42.9)	-90 (-40.2)
Dec	---	-30 (-22.9)	-30 (-22.9)	-30 (-22.9)	-30 (-22.9)	-30 (-22.9)	-35 (-26.7)	-29 (-22.1)
Average	---	-148 (-23.2)	-157 (-24.6)	-158 (-24.8)	-157 (-24.6)	-157 (-24.6)	-159 (-25.0)	-150 (-23.5)

Table 89. Monthly Streamflow Normal Year (2005) – Arkansas River at Moffat Street (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	196	137	133	134	131	133	126	138
Feb	1,029	647	631	631	642	632	640	641
Mar	1,358	947	922	921	929	923	943	941
Apr	842	685	669	668	658	665	666	685
May	558	444	488	484	482	488	459	475
Jun	179	98	100	100	98	99	90	102
Jul	261	91	98	98	95	95	83	92
Aug	172	90	93	93	90	93	85	93
Sep	97	67	64	64	65	65	62	67
Oct	102	77	76	76	77	76	73	76
Nov	35	70	70	70	70	70	64	70
Dec	123	87	93	82	85	86	76	95
Average	409	284	284	283	283	283	278	287
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-4 (-2.9)	-3 (-2.2)	-6 (-4.4)	-4 (-2.9)	-11 (-8.0)	1 (0.7)
Feb	---	---	-16 (-2.5)	-16 (-2.5)	-5 (-0.8)	-15 (-2.3)	-7 (-1.1)	-6 (-0.9)
Mar	---	---	-25 (-2.6)	-26 (-2.7)	-18 (-1.9)	-24 (-2.5)	-4 (-0.4)	-6 (-0.6)
Apr	---	---	-16 (-2.3)	-17 (-2.5)	-27 (-3.9)	-20 (-2.9)	-19 (-2.8)	0 (0.0)
May	---	---	44 (9.9)	40 (9.0)	38 (8.6)	44 (9.9)	15 (3.4)	31 (7.0)
Jun	---	---	2 (2.0)	2 (2.0)	0 (0.0)	1 (1.0)	-8 (-8.2)	4 (4.1)
Jul	---	---	7 (7.7)	7 (7.7)	4 (4.4)	4 (4.4)	-8 (-8.8)	1 (1.1)
Aug	---	---	3 (3.3)	3 (3.3)	0 (0.0)	3 (3.3)	-5 (-5.6)	3 (3.3)
Sep	---	---	-3 (-4.5)	-3 (-4.5)	-2 (-3.0)	-2 (-3.0)	-5 (-7.5)	0 (0.0)
Oct	---	---	-1 (-1.3)	-1 (-1.3)	0 (0.0)	-1 (-1.3)	-4 (-5.2)	-1 (-1.3)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-6 (-8.6)	0 (0.0)
Dec	---	---	6 (6.9)	-5 (-5.7)	-2 (-2.3)	-1 (-1.1)	-11 (-12.6)	8 (9.2)
Average	---	---	0 (0.0)	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	-6 (-2.1)	3 (1.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-59 (-30.1)	-63 (-32.1)	-62 (-31.6)	-65 (-33.2)	-63 (-32.1)	-70 (-35.7)	-58 (-29.6)
Feb	---	-382 (-37.1)	-398 (-38.7)	-398 (-38.7)	-387 (-37.6)	-397 (-38.6)	-389 (-37.8)	-388 (-37.7)
Mar	---	-411 (-30.3)	-436 (-32.1)	-437 (-32.2)	-429 (-31.6)	-435 (-32.0)	-415 (-30.6)	-417 (-30.7)
Apr	---	-157 (-18.6)	-173 (-20.5)	-174 (-20.7)	-184 (-21.9)	-177 (-21.0)	-176 (-20.9)	-157 (-18.6)
May	---	-114 (-20.4)	-70 (-12.5)	-74 (-13.3)	-76 (-13.6)	-70 (-12.5)	-99 (-17.7)	-83 (-14.9)
Jun	---	-81 (-45.3)	-79 (-44.1)	-79 (-44.1)	-81 (-45.3)	-80 (-44.7)	-89 (-49.7)	-77 (-43.0)
Jul	---	-170 (-65.1)	-163 (-62.5)	-163 (-62.5)	-166 (-63.6)	-166 (-63.6)	-178 (-68.2)	-169 (-64.8)
Aug	---	-82 (-47.7)	-79 (-45.9)	-79 (-45.9)	-82 (-47.7)	-79 (-45.9)	-87 (-50.6)	-79 (-45.9)
Sep	---	-30 (-30.9)	-33 (-34.0)	-33 (-34.0)	-32 (-33.0)	-32 (-33.0)	-35 (-36.1)	-30 (-30.9)
Oct	---	-25 (-24.5)	-26 (-25.5)	-26 (-25.5)	-25 (-24.5)	-26 (-25.5)	-29 (-28.4)	-26 (-25.5)
Nov	---	35 (100.0)	35 (100.0)	35 (100.0)	35 (100.0)	35 (100.0)	29 (82.9)	35 (100.0)
Dec	---	-36 (-29.3)	-30 (-24.4)	-41 (-33.3)	-38 (-30.9)	-37 (-30.1)	-47 (-38.2)	-28 (-22.8)
Average	---	-125 (-30.6)	-125 (-30.6)	-126 (-30.8)	-126 (-30.8)	-126 (-30.8)	-131 (-32.0)	-122 (-29.8)

Table 90. Monthly Streamflow Wet Year (1997) – Arkansas River at Moffat Street (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	827	390	390	394	387	390	384	392
Feb	1,300	1,043	995	1,000	1,021	991	1,034	1,026
Mar	4,154	3,995	3,993	4,002	3,998	4,004	4,004	3,984
Apr	1,226	1,037	1,029	1,026	1,026	1,027	1,027	1,056
May	1,015	848	849	848	842	849	845	870
Jun	421	207	204	200	203	209	194	204
Jul	373	143	151	150	146	149	135	145
Aug	554	455	422	426	454	425	440	442
Sep	314	280	276	276	279	276	272	277
Oct	157	120	116	115	115	115	114	115
Nov	160	104	100	102	102	100	99	101
Dec	585	325	326	325	322	324	323	336
Average	925	747	739	740	743	740	740	747
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	4 (1.0)	-3 (-0.8)	0 (0.0)	-6 (-1.5)	2 (0.5)
Feb	---	---	-48 (-4.6)	-43 (-4.1)	-22 (-2.1)	-52 (-5.0)	-9 (-0.9)	-17 (-1.6)
Mar	---	---	-2 (-0.1)	7 (0.2)	3 (0.1)	9 (0.2)	9 (0.2)	-11 (-0.3)
Apr	---	---	-8 (-0.8)	-11 (-1.1)	-11 (-1.1)	-10 (-1.0)	-10 (-1.0)	19 (1.8)
May	---	---	1 (0.1)	0 (0.0)	-6 (-0.7)	1 (0.1)	-3 (-0.4)	22 (2.6)
Jun	---	---	-3 (-1.4)	-7 (-3.4)	-4 (-1.9)	2 (1.0)	-13 (-6.3)	-3 (-1.4)
Jul	---	---	8 (5.6)	7 (4.9)	3 (2.1)	6 (4.2)	-8 (-5.6)	2 (1.4)
Aug	---	---	-33 (-7.3)	-29 (-6.4)	-1 (-0.2)	-30 (-6.6)	-15 (-3.3)	-13 (-2.9)
Sep	---	---	-4 (-1.4)	-4 (-1.4)	-1 (-0.4)	-4 (-1.4)	-8 (-2.9)	-3 (-1.1)
Oct	---	---	-4 (-3.3)	-5 (-4.2)	-5 (-4.2)	-5 (-4.2)	-6 (-5.0)	-5 (-4.2)
Nov	---	---	-4 (-3.8)	-2 (-1.9)	-2 (-1.9)	-4 (-3.8)	-5 (-4.8)	-3 (-2.9)
Dec	---	---	1 (0.3)	0 (0.0)	-3 (-0.9)	-1 (-0.3)	-2 (-0.6)	11 (3.4)
Average	---	---	-8 (-1.1)	-7 (-0.9)	-4 (-0.5)	-7 (-0.9)	-7 (-0.9)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-437 (-52.8)	-437 (-52.8)	-433 (-52.4)	-440 (-53.2)	-437 (-52.8)	-443 (-53.6)	-435 (-52.6)
Feb	---	-257 (-19.8)	-305 (-23.5)	-300 (-23.1)	-279 (-21.5)	-309 (-23.8)	-266 (-20.5)	-274 (-21.1)
Mar	---	-159 (-3.8)	-161 (-3.9)	-152 (-3.7)	-156 (-3.8)	-150 (-3.6)	-150 (-3.6)	-170 (-4.1)
Apr	---	-189 (-15.4)	-197 (-16.1)	-200 (-16.3)	-200 (-16.3)	-199 (-16.2)	-199 (-16.2)	-170 (-13.9)
May	---	-167 (-16.5)	-166 (-16.4)	-167 (-16.5)	-173 (-17.0)	-166 (-16.4)	-170 (-16.7)	-145 (-14.3)
Jun	---	-214 (-50.8)	-217 (-51.5)	-221 (-52.5)	-218 (-51.8)	-212 (-50.4)	-227 (-53.9)	-217 (-51.5)
Jul	---	-230 (-61.7)	-222 (-59.5)	-223 (-59.8)	-227 (-60.9)	-224 (-60.1)	-238 (-63.8)	-228 (-61.1)
Aug	---	-99 (-17.9)	-132 (-23.8)	-128 (-23.1)	-100 (-18.1)	-129 (-23.3)	-114 (-20.6)	-112 (-20.2)
Sep	---	-34 (-10.8)	-38 (-12.1)	-38 (-12.1)	-35 (-11.1)	-38 (-12.1)	-42 (-13.4)	-37 (-11.8)
Oct	---	-37 (-23.6)	-41 (-26.1)	-42 (-26.8)	-42 (-26.8)	-42 (-26.8)	-43 (-27.4)	-42 (-26.8)
Nov	---	-56 (-35.0)	-60 (-37.5)	-58 (-36.3)	-58 (-36.3)	-60 (-37.5)	-61 (-38.1)	-59 (-36.9)
Dec	---	-260 (-44.4)	-259 (-44.3)	-260 (-44.4)	-263 (-45.0)	-261 (-44.6)	-262 (-44.8)	-249 (-42.6)
Average	---	-178 (-19.2)	-186 (-20.1)	-185 (-20.0)	-182 (-19.7)	-185 (-20.0)	-185 (-20.0)	-178 (-19.2)

Table 91. Monthly Streamflow Dry Year (2004) – Arkansas River at Moffat Street (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	319	174	176	177	172	177	167	172
Feb	794	222	197	198	209	199	212	202
Mar	1,097	602	574	576	594	581	586	590
Apr	586	413	402	401	408	400	381	411
May	295	195	196	194	193	194	183	194
Jun	77	53	48	47	52	49	36	49
Jul	128	86	75	75	83	75	70	81
Aug	158	99	96	96	99	96	91	96
Sep	113	65	67	67	68	67	62	66
Oct	61	48	49	49	49	49	42	48
Nov	100	46	45	45	45	45	41	45
Dec	132	56	65	65	54	65	61	72
Average	319	172	166	166	169	166	161	169
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	2 (1.1)	3 (1.7)	-2 (-1.1)	3 (1.7)	-7 (-4.0)	-2 (-1.1)
Feb	---	---	-25 (-11.3)	-24 (-10.8)	-13 (-5.9)	-23 (-10.4)	-10 (-4.5)	-20 (-9.0)
Mar	---	---	-28 (-4.7)	-26 (-4.3)	-8 (-1.3)	-21 (-3.5)	-16 (-2.7)	-12 (-2.0)
Apr	---	---	-11 (-2.7)	-12 (-2.9)	-5 (-1.2)	-13 (-3.1)	-32 (-7.7)	-2 (-0.5)
May	---	---	1 (0.5)	-1 (-0.5)	-2 (-1.0)	-1 (-0.5)	-12 (-6.2)	-1 (-0.5)
Jun	---	---	-5 (-9.4)	-6 (-11.3)	-1 (-1.9)	-4 (-7.5)	-17 (-32.1)	-4 (-7.5)
Jul	---	---	-11 (-12.8)	-11 (-12.8)	-3 (-3.5)	-11 (-12.8)	-16 (-18.6)	-5 (-5.8)
Aug	---	---	-3 (-3.0)	-3 (-3.0)	0 (0.0)	-3 (-3.0)	-8 (-8.1)	-3 (-3.0)
Sep	---	---	2 (3.1)	2 (3.1)	3 (4.6)	2 (3.1)	-3 (-4.6)	1 (1.5)
Oct	---	---	1 (2.1)	1 (2.1)	1 (2.1)	1 (2.1)	-6 (-12.5)	0 (0.0)
Nov	---	---	-1 (-2.2)	-1 (-2.2)	-1 (-2.2)	-1 (-2.2)	-5 (-10.9)	-1 (-2.2)
Dec	---	---	9 (16.1)	9 (16.1)	-2 (-3.6)	9 (16.1)	5 (8.9)	16 (28.6)
Average	---	---	-6 (-3.5)	-6 (-3.5)	-3 (-1.7)	-6 (-3.5)	-11 (-6.4)	-3 (-1.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-145 (-45.5)	-143 (-44.8)	-142 (-44.5)	-147 (-46.1)	-142 (-44.5)	-152 (-47.6)	-147 (-46.1)
Feb	---	-572 (-72.0)	-597 (-75.2)	-596 (-75.1)	-585 (-73.7)	-595 (-74.9)	-582 (-73.3)	-592 (-74.6)
Mar	---	-495 (-45.1)	-523 (-47.7)	-521 (-47.5)	-503 (-45.9)	-516 (-47.0)	-511 (-46.6)	-507 (-46.2)
Apr	---	-173 (-29.5)	-184 (-31.4)	-185 (-31.6)	-178 (-30.4)	-186 (-31.7)	-205 (-35.0)	-175 (-29.9)
May	---	-100 (-33.9)	-99 (-33.6)	-101 (-34.2)	-102 (-34.6)	-101 (-34.2)	-112 (-38.0)	-101 (-34.2)
Jun	---	-24 (-31.2)	-29 (-37.7)	-30 (-39.0)	-25 (-32.5)	-28 (-36.4)	-41 (-53.2)	-28 (-36.4)
Jul	---	-42 (-32.8)	-53 (-41.4)	-53 (-41.4)	-45 (-35.2)	-53 (-41.4)	-58 (-45.3)	-47 (-36.7)
Aug	---	-59 (-37.3)	-62 (-39.2)	-62 (-39.2)	-59 (-37.3)	-62 (-39.2)	-67 (-42.4)	-62 (-39.2)
Sep	---	-48 (-42.5)	-46 (-40.7)	-46 (-40.7)	-45 (-39.8)	-46 (-40.7)	-51 (-45.1)	-47 (-41.6)
Oct	---	-13 (-21.3)	-12 (-19.7)	-12 (-19.7)	-12 (-19.7)	-12 (-19.7)	-19 (-31.1)	-13 (-21.3)
Nov	---	-54 (-54.0)	-55 (-55.0)	-55 (-55.0)	-55 (-55.0)	-55 (-55.0)	-59 (-59.0)	-55 (-55.0)
Dec	---	-76 (-57.6)	-67 (-50.8)	-67 (-50.8)	-78 (-59.1)	-67 (-50.8)	-71 (-53.8)	-60 (-45.5)
Average	---	-147 (-46.1)	-153 (-48.0)	-153 (-48.0)	-150 (-47.0)	-153 (-48.0)	-158 (-49.5)	-150 (-47.0)

Arkansas River near Avondale

The Avondale gage is located downstream from Fountain Creek and upstream from Colorado Canal. Mean monthly simulated streamflow at the Avondale gage is shown in Table 92 through Table 95 for direct effects. All alternatives show negligible to minor decreases in flow compared to the No Action during most months. Cumulative Effects are shown in Table 96 through Table 99. In general, flows are higher than direct effect in the winter months when exchanges are curtailed for the winter water storage program and return flows are greater due to higher municipal demands in the basin. Flows are lower than direct effects in the summer months due to greater exchanges by municipal entities needed to meet higher demands. Differences between alternatives are similar to direct effects.

Table 92. Overall Average Monthly Streamflow – Arkansas River near Avondale (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	408	413	415	414	411	415	412	417
Feb	427	428	431	431	426	431	429	433
Mar	524	521	505	504	499	505	509	511
Apr	909	878	880	878	870	879	879	891
May	1,645	1,620	1,611	1,610	1,610	1,611	1,613	1,623
Jun	2,570	2,528	2,518	2,517	2,515	2,518	2,520	2,538
Jul	1,729	1,700	1,683	1,678	1,663	1,685	1,687	1,700
Aug	1,191	1,169	1,147	1,155	1,169	1,145	1,143	1,159
Sep	584	585	569	572	584	569	569	578
Oct	531	528	511	511	527	510	511	518
Nov	508	511	505	505	509	505	505	509
Dec	391	396	399	399	394	399	397	401
Average	953	941	933	933	933	933	933	941
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	2 (0.5)	1 (0.2)	-2 (-0.5)	2 (0.5)	-1 (-0.2)	4 (1.0)
Feb	---	---	3 (0.7)	3 (0.7)	-2 (-0.5)	3 (0.7)	1 (0.2)	5 (1.2)
Mar	---	---	-16 (-3.1)	-17 (-3.3)	-22 (-4.2)	-16 (-3.1)	-12 (-2.3)	-10 (-1.9)
Apr	---	---	2 (0.2)	0 (0.0)	-8 (-0.9)	1 (0.1)	1 (0.1)	13 (1.5)
May	---	---	-9 (-0.6)	-10 (-0.6)	-10 (-0.6)	-9 (-0.6)	-7 (-0.4)	3 (0.2)
Jun	---	---	-10 (-0.4)	-11 (-0.4)	-13 (-0.5)	-10 (-0.4)	-8 (-0.3)	10 (0.4)
Jul	---	---	-17 (-1.0)	-22 (-1.3)	-37 (-2.2)	-15 (-0.9)	-13 (-0.8)	0 (0.0)
Aug	---	---	-22 (-1.9)	-14 (-1.2)	0 (0.0)	-24 (-2.1)	-26 (-2.2)	-10 (-0.9)
Sep	---	---	-16 (-2.7)	-13 (-2.2)	-1 (-0.2)	-16 (-2.7)	-16 (-2.7)	-7 (-1.2)
Oct	---	---	-17 (-3.2)	-17 (-3.2)	-1 (-0.2)	-18 (-3.4)	-17 (-3.2)	-10 (-1.9)
Nov	---	---	-6 (-1.2)	-6 (-1.2)	-2 (-0.4)	-6 (-1.2)	-6 (-1.2)	-2 (-0.4)
Dec	---	---	3 (0.8)	3 (0.8)	-2 (-0.5)	3 (0.8)	1 (0.3)	5 (1.3)
Average	---	---	-8 (-0.9)	-8 (-0.9)	-8 (-0.9)	-8 (-0.9)	-8 (-0.9)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	5 (1.2)	7 (1.7)	6 (1.5)	3 (0.7)	7 (1.7)	4 (1.0)	9 (2.2)
Feb	---	1 (0.2)	4 (0.9)	4 (0.9)	-1 (-0.2)	4 (0.9)	2 (0.5)	6 (1.4)
Mar	---	-3 (-0.6)	-19 (-3.6)	-20 (-3.8)	-25 (-4.8)	-19 (-3.6)	-15 (-2.9)	-13 (-2.5)
Apr	---	-31 (-3.4)	-29 (-3.2)	-31 (-3.4)	-39 (-4.3)	-30 (-3.3)	-30 (-3.3)	-18 (-2.0)
May	---	-25 (-1.5)	-34 (-2.1)	-35 (-2.1)	-35 (-2.1)	-34 (-2.1)	-32 (-1.9)	-22 (-1.3)
Jun	---	-42 (-1.6)	-52 (-2.0)	-53 (-2.1)	-55 (-2.1)	-52 (-2.0)	-50 (-1.9)	-32 (-1.2)
Jul	---	-29 (-1.7)	-46 (-2.7)	-51 (-2.9)	-66 (-3.8)	-44 (-2.5)	-42 (-2.4)	-29 (-1.7)
Aug	---	-22 (-1.8)	-44 (-3.7)	-36 (-3.0)	-22 (-1.8)	-46 (-3.9)	-48 (-4.0)	-32 (-2.7)
Sep	---	1 (0.2)	-15 (-2.6)	-12 (-2.1)	0 (0.0)	-15 (-2.6)	-15 (-2.6)	-6 (-1.0)
Oct	---	-3 (-0.6)	-20 (-3.8)	-20 (-3.8)	-4 (-0.8)	-21 (-4.0)	-20 (-3.8)	-13 (-2.4)
Nov	---	3 (0.6)	-3 (-0.6)	-3 (-0.6)	1 (0.2)	-3 (-0.6)	-3 (-0.6)	1 (0.2)
Dec	---	5 (1.3)	8 (2.0)	8 (2.0)	3 (0.8)	8 (2.0)	6 (1.5)	10 (2.6)
Average	---	-11 (-1.2)	-20 (-2.1)	-20 (-2.1)	-19 (-2.0)	-20 (-2.1)	-20 (-2.1)	-11 (-1.2)

Table 93. Monthly Streamflow Normal Year (2005) – Arkansas River near Avondale (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	347	357	355	355	353	355	354	358
Feb	260	264	278	276	267	278	266	276
Mar	380	370	366	366	370	366	363	366
Apr	676	663	665	663	659	663	658	667
May	1,428	1,387	1,365	1,366	1,380	1,367	1,371	1,378
Jun	1,575	1,560	1,521	1,521	1,535	1,518	1,528	1,554
Jul	958	940	921	918	927	921	924	938
Aug	775	759	741	740	747	740	742	750
Sep	317	307	300	299	299	300	300	307
Oct	465	442	426	426	438	426	427	434
Nov	346	347	347	347	344	347	347	351
Dec	264	252	252	252	252	252	249	253
Average	652	639	630	629	633	630	629	638
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-2 (-0.6)	-2 (-0.6)	-4 (-1.1)	-2 (-0.6)	-3 (-0.8)	1 (0.3)
Feb	---	---	14 (5.3)	12 (4.5)	3 (1.1)	14 (5.3)	2 (0.8)	12 (4.5)
Mar	---	---	-4 (-1.1)	-4 (-1.1)	0 (0.0)	-4 (-1.1)	-7 (-1.9)	-4 (-1.1)
Apr	---	---	2 (0.3)	0 (0.0)	-4 (-0.6)	0 (0.0)	-5 (-0.8)	4 (0.6)
May	---	---	-22 (-1.6)	-21 (-1.5)	-7 (-0.5)	-20 (-1.4)	-16 (-1.2)	-9 (-0.6)
Jun	---	---	-39 (-2.5)	-39 (-2.5)	-25 (-1.6)	-42 (-2.7)	-32 (-2.1)	-6 (-0.4)
Jul	---	---	-19 (-2.0)	-22 (-2.3)	-13 (-1.4)	-19 (-2.0)	-16 (-1.7)	-2 (-0.2)
Aug	---	---	-18 (-2.4)	-19 (-2.5)	-12 (-1.6)	-19 (-2.5)	-17 (-2.2)	-9 (-1.2)
Sep	---	---	-7 (-2.3)	-8 (-2.6)	-8 (-2.6)	-7 (-2.3)	-7 (-2.3)	0 (0.0)
Oct	---	---	-16 (-3.6)	-16 (-3.6)	-4 (-0.9)	-16 (-3.6)	-15 (-3.4)	-8 (-1.8)
Nov	---	---	0 (0.0)	0 (0.0)	-3 (-0.9)	0 (0.0)	0 (0.0)	4 (1.2)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-3 (-1.2)	1 (0.4)
Average	---	---	-9 (-1.4)	-10 (-1.6)	-6 (-0.9)	-9 (-1.4)	-10 (-1.6)	-1 (-0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	10 (2.9)	8 (2.3)	8 (2.3)	6 (1.7)	8 (2.3)	7 (2.0)	11 (3.2)
Feb	---	4 (1.5)	18 (6.9)	16 (6.2)	7 (2.7)	18 (6.9)	6 (2.3)	16 (6.2)
Mar	---	-10 (-2.6)	-14 (-3.7)	-14 (-3.7)	-10 (-2.6)	-14 (-3.7)	-17 (-4.5)	-14 (-3.7)
Apr	---	-13 (-1.9)	-11 (-1.6)	-13 (-1.9)	-17 (-2.5)	-13 (-1.9)	-18 (-2.7)	-9 (-1.3)
May	---	-41 (-2.9)	-63 (-4.4)	-62 (-4.3)	-48 (-3.4)	-61 (-4.3)	-57 (-4.0)	-50 (-3.5)
Jun	---	-15 (-1.0)	-54 (-3.4)	-54 (-3.4)	-40 (-2.5)	-57 (-3.6)	-47 (-3.0)	-21 (-1.3)
Jul	---	-18 (-1.9)	-37 (-3.9)	-40 (-4.2)	-31 (-3.2)	-37 (-3.9)	-34 (-3.5)	-20 (-2.1)
Aug	---	-16 (-2.1)	-34 (-4.4)	-35 (-4.5)	-28 (-3.6)	-35 (-4.5)	-33 (-4.3)	-25 (-3.2)
Sep	---	-10 (-3.2)	-17 (-5.4)	-18 (-5.7)	-18 (-5.7)	-17 (-5.4)	-17 (-5.4)	-10 (-3.2)
Oct	---	-23 (-4.9)	-39 (-8.4)	-39 (-8.4)	-27 (-5.8)	-39 (-8.4)	-38 (-8.2)	-31 (-6.7)
Nov	---	1 (0.3)	1 (0.3)	1 (0.3)	-2 (-0.6)	1 (0.3)	1 (0.3)	5 (1.4)
Dec	---	-12 (-4.5)	-12 (-4.5)	-12 (-4.5)	-12 (-4.5)	-12 (-4.5)	-15 (-5.7)	-11 (-4.2)
Average	---	-13 (-2.0)	-22 (-3.4)	-23 (-3.5)	-19 (-2.9)	-22 (-3.4)	-23 (-3.5)	-14 (-2.1)

Table 94. Monthly Streamflow Wet Year (1997) – Arkansas River near Avondale (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	391	397		398		398		396		398		398		402	
Feb	399	405		408		408		404		408		405		409	
Mar	731	697		674		677		692		673		672		674	
Apr	1,173	1,142		1,141		1,135		1,141		1,141		1,141		1,144	
May	1,662	1,642		1,620		1,621		1,634		1,621		1,621		1,630	
Jun	5,067	4,988		5,037		5,039		4,955		5,038		5,040		5,055	
Jul	1,629	1,589		1,599		1,600		1,581		1,601		1,600		1,608	
Aug	1,613	1,599		1,591		1,591		1,587		1,590		1,591		1,601	
Sep	712	718		701		701		720		700		700		709	
Oct	683	681		659		659		678		659		659		665	
Nov	853	827		868		869		816		869		867		870	
Dec	590	598		595		595		595		595		593		598	
Average	1,292	1,274		1,274		1,274		1,267		1,274		1,274		1,280	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		1	(0.3)	1	(0.3)	-1	(-0.3)	1	(0.3)	1	(0.3)	5	(1.3)
Feb	---	---		3	(0.7)	3	(0.7)	-1	(-0.2)	3	(0.7)	0	(0.0)	4	(1.0)
Mar	---	---		-23	(-3.3)	-20	(-2.9)	-5	(-0.7)	-24	(-3.4)	-25	(-3.6)	-23	(-3.3)
Apr	---	---		-1	(-0.1)	-7	(-0.6)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	2	(0.2)
May	---	---		-22	(-1.3)	-21	(-1.3)	-8	(-0.5)	-21	(-1.3)	-21	(-1.3)	-12	(-0.7)
Jun	---	---		49	(1.0)	51	(1.0)	-33	(-0.7)	50	(1.0)	52	(1.0)	67	(1.3)
Jul	---	---		10	(0.6)	11	(0.7)	-8	(-0.5)	12	(0.8)	11	(0.7)	19	(1.2)
Aug	---	---		-8	(-0.5)	-8	(-0.5)	-12	(-0.8)	-9	(-0.6)	-8	(-0.5)	2	(0.1)
Sep	---	---		-17	(-2.4)	-17	(-2.4)	2	(0.3)	-18	(-2.5)	-18	(-2.5)	-9	(-1.3)
Oct	---	---		-22	(-3.2)	-22	(-3.2)	-3	(-0.4)	-22	(-3.2)	-22	(-3.2)	-16	(-2.3)
Nov	---	---		41	(5.0)	42	(5.1)	-11	(-1.3)	42	(5.1)	40	(4.8)	43	(5.2)
Dec	---	---		-3	(-0.5)	-3	(-0.5)	-3	(-0.5)	-3	(-0.5)	-5	(-0.8)	0	(0.0)
Average	---	---		0	(0.0)	0	(0.0)	-7	(-0.5)	0	(0.0)	0	(0.0)	6	(0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	6	(1.5)	7	(1.8)	7	(1.8)	5	(1.3)	7	(1.8)	7	(1.8)	11	(2.8)
Feb	---	6	(1.5)	9	(2.3)	9	(2.3)	5	(1.3)	9	(2.3)	6	(1.5)	10	(2.5)
Mar	---	-34	(-4.7)	-57	(-7.8)	-54	(-7.4)	-39	(-5.3)	-58	(-7.9)	-59	(-8.1)	-57	(-7.8)
Apr	---	-31	(-2.6)	-32	(-2.7)	-38	(-3.2)	-32	(-2.7)	-32	(-2.7)	-32	(-2.7)	-29	(-2.5)
May	---	-20	(-1.2)	-42	(-2.5)	-41	(-2.5)	-28	(-1.7)	-41	(-2.5)	-41	(-2.5)	-32	(-1.9)
Jun	---	-79	(-1.6)	-30	(-0.6)	-28	(-0.6)	-112	(-2.2)	-29	(-0.6)	-27	(-0.5)	-12	(-0.2)
Jul	---	-40	(-2.5)	-30	(-1.8)	-29	(-1.8)	-48	(-2.9)	-28	(-1.7)	-29	(-1.8)	-21	(-1.3)
Aug	---	-14	(-0.9)	-22	(-1.4)	-22	(-1.4)	-26	(-1.6)	-23	(-1.4)	-22	(-1.4)	-12	(-0.7)
Sep	---	6	(0.8)	-11	(-1.5)	-11	(-1.5)	8	(1.1)	-12	(-1.7)	-12	(-1.7)	-3	(-0.4)
Oct	---	-2	(-0.3)	-24	(-3.5)	-24	(-3.5)	-5	(-0.7)	-24	(-3.5)	-24	(-3.5)	-18	(-2.6)
Nov	---	-26	(-3.0)	15	(1.8)	16	(1.9)	-37	(-4.3)	16	(1.9)	14	(1.6)	17	(2.0)
Dec	---	8	(1.4)	5	(0.8)	5	(0.8)	5	(0.8)	5	(0.8)	3	(0.5)	8	(1.4)
Average	---	-18	(-1.4)	-18	(-1.4)	-18	(-1.4)	-25	(-1.9)	-18	(-1.4)	-18	(-1.4)	-12	(-0.9)

Table 95. Monthly Streamflow Dry Year (2004) – Arkansas River near Avondale (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	258	265	270	270	263	270	265	270
Feb	334	334	331	331	330	331	331	335
Mar	356	344	315	314	312	317	335	327
Apr	716	654	639	640	650	640	643	650
May	1,072	1,086	1,070	1,070	1,054	1,071	1,077	1,083
Jun	1,262	1,221	1,212	1,217	1,214	1,213	1,237	1,223
Jul	1,003	985	977	980	977	977	977	986
Aug	729	719	714	714	714	715	713	720
Sep	263	259	259	259	255	258	252	261
Oct	318	337	326	327	331	327	316	332
Nov	392	395	390	390	392	388	384	390
Dec	318	323	320	320	318	320	321	325
Average	586	578	570	571	569	570	572	576
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	5 (1.9)	5 (1.9)	-2 (-0.8)	5 (1.9)	0 (0.0)	5 (1.9)
Feb	---	---	-3 (-0.9)	-3 (-0.9)	-4 (-1.2)	-3 (-0.9)	-3 (-0.9)	1 (0.3)
Mar	---	---	-29 (-8.4)	-30 (-8.7)	-32 (-9.3)	-27 (-7.8)	-9 (-2.6)	-17 (-4.9)
Apr	---	---	-15 (-2.3)	-14 (-2.1)	-4 (-0.6)	-14 (-2.1)	-11 (-1.7)	-4 (-0.6)
May	---	---	-16 (-1.5)	-16 (-1.5)	-32 (-2.9)	-15 (-1.4)	-9 (-0.8)	-3 (-0.3)
Jun	---	---	-9 (-0.7)	-4 (-0.3)	-7 (-0.6)	-8 (-0.7)	16 (1.3)	2 (0.2)
Jul	---	---	-8 (-0.8)	-5 (-0.5)	-8 (-0.8)	-8 (-0.8)	-8 (-0.8)	1 (0.1)
Aug	---	---	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-4 (-0.6)	-6 (-0.8)	1 (0.1)
Sep	---	---	0 (0.0)	0 (0.0)	-4 (-1.5)	-1 (-0.4)	-7 (-2.7)	2 (0.8)
Oct	---	---	-11 (-3.3)	-10 (-3.0)	-6 (-1.8)	-10 (-3.0)	-21 (-6.2)	-5 (-1.5)
Nov	---	---	-5 (-1.3)	-5 (-1.3)	-3 (-0.8)	-7 (-1.8)	-11 (-2.8)	-5 (-1.3)
Dec	---	---	-3 (-0.9)	-3 (-0.9)	-5 (-1.5)	-3 (-0.9)	-2 (-0.6)	2 (0.6)
Average	---	---	-8 (-1.4)	-7 (-1.2)	-9 (-1.6)	-8 (-1.4)	-6 (-1.0)	-2 (-0.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	7 (2.7)	12 (4.7)	12 (4.7)	5 (1.9)	12 (4.7)	7 (2.7)	12 (4.7)
Feb	---	0 (0.0)	-3 (-0.9)	-3 (-0.9)	-4 (-1.2)	-3 (-0.9)	-3 (-0.9)	1 (0.3)
Mar	---	-12 (-3.4)	-41 (-11.5)	-42 (-11.8)	-44 (-12.4)	-39 (-11.0)	-21 (-5.9)	-29 (-8.1)
Apr	---	-62 (-8.7)	-77 (-10.8)	-76 (-10.6)	-66 (-9.2)	-76 (-10.6)	-73 (-10.2)	-66 (-9.2)
May	---	14 (1.3)	-2 (-0.2)	-2 (-0.2)	-18 (-1.7)	-1 (-0.1)	5 (0.5)	11 (1.0)
Jun	---	-41 (-3.2)	-50 (-4.0)	-45 (-3.6)	-48 (-3.8)	-49 (-3.9)	-25 (-2.0)	-39 (-3.1)
Jul	---	-18 (-1.8)	-26 (-2.6)	-23 (-2.3)	-26 (-2.6)	-26 (-2.6)	-26 (-2.6)	-17 (-1.7)
Aug	---	-10 (-1.4)	-15 (-2.1)	-15 (-2.1)	-15 (-2.1)	-14 (-1.9)	-16 (-2.2)	-9 (-1.2)
Sep	---	-4 (-1.5)	-4 (-1.5)	-4 (-1.5)	-8 (-3.0)	-5 (-1.9)	-11 (-4.2)	-2 (-0.8)
Oct	---	19 (6.0)	8 (2.5)	9 (2.8)	13 (4.1)	9 (2.8)	-2 (-0.6)	14 (4.4)
Nov	---	3 (0.8)	-2 (-0.5)	-2 (-0.5)	0 (0.0)	-4 (-1.0)	-8 (-2.0)	-2 (-0.5)
Dec	---	5 (1.6)	2 (0.6)	2 (0.6)	0 (0.0)	2 (0.6)	3 (0.9)	7 (2.2)
Average	---	-8 (-1.4)	-16 (-2.7)	-15 (-2.6)	-17 (-2.9)	-16 (-2.7)	-14 (-2.4)	-10 (-1.7)

Table 96. Overall Average Monthly Streamflow – Arkansas River near Avondale (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	408	458	457	457	456	458	456	460
Feb	427	479	479	479	477	479	476	481
Mar	524	520	515	516	516	516	513	521
Apr	909	825	818	817	811	816	815	822
May	1,645	1,539	1,522	1,523	1,529	1,523	1,523	1,533
Jun	2,570	2,446	2,428	2,429	2,431	2,428	2,432	2,441
Jul	1,729	1,635	1,618	1,610	1,604	1,616	1,617	1,642
Aug	1,191	1,153	1,144	1,147	1,143	1,145	1,144	1,148
Sep	584	553	549	550	548	548	546	555
Oct	531	502	487	490	497	488	488	495
Nov	508	517	512	511	513	512	509	514
Dec	391	438	437	438	436	437	435	439
Average	953	923	915	915	915	915	914	922
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-0.2)	-1 (-0.2)	-2 (-0.4)	0 (0.0)	-2 (-0.4)	2 (0.4)
Feb	---	---	0 (0.0)	0 (0.0)	-2 (-0.4)	0 (0.0)	-3 (-0.6)	2 (0.4)
Mar	---	---	-5 (-1.0)	-4 (-0.8)	-4 (-0.8)	-4 (-0.8)	-7 (-1.3)	1 (0.2)
Apr	---	---	-7 (-0.8)	-8 (-1.0)	-14 (-1.7)	-9 (-1.1)	-10 (-1.2)	-3 (-0.4)
May	---	---	-17 (-1.1)	-16 (-1.0)	-10 (-0.6)	-16 (-1.0)	-16 (-1.0)	-6 (-0.4)
Jun	---	---	-18 (-0.7)	-17 (-0.7)	-15 (-0.6)	-18 (-0.7)	-14 (-0.6)	-5 (-0.2)
Jul	---	---	-17 (-1.0)	-25 (-1.5)	-31 (-1.9)	-19 (-1.2)	-18 (-1.1)	7 (0.4)
Aug	---	---	-9 (-0.8)	-6 (-0.5)	-10 (-0.9)	-8 (-0.7)	-9 (-0.8)	-5 (-0.4)
Sep	---	---	-4 (-0.7)	-3 (-0.5)	-5 (-0.9)	-5 (-0.9)	-7 (-1.3)	2 (0.4)
Oct	---	---	-15 (-3.0)	-12 (-2.4)	-5 (-1.0)	-14 (-2.8)	-14 (-2.8)	-7 (-1.4)
Nov	---	---	-5 (-1.0)	-6 (-1.2)	-4 (-0.8)	-5 (-1.0)	-8 (-1.5)	-3 (-0.6)
Dec	---	---	-1 (-0.2)	0 (0.0)	-2 (-0.5)	-1 (-0.2)	-3 (-0.7)	1 (0.2)
Average	---	---	-8 (-0.9)	-8 (-0.9)	-8 (-0.9)	-8 (-0.9)	-9 (-1.0)	-1 (-0.1)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	50 (12.3)	49 (12.0)	49 (12.0)	48 (11.8)	50 (12.3)	48 (11.8)	52 (12.7)
Feb	---	52 (12.2)	52 (12.2)	52 (12.2)	50 (11.7)	52 (12.2)	49 (11.5)	54 (12.6)
Mar	---	-4 (-0.8)	-9 (-1.7)	-8 (-1.5)	-8 (-1.5)	-8 (-1.5)	-11 (-2.1)	-3 (-0.6)
Apr	---	-84 (-9.2)	-91 (-10.0)	-92 (-10.1)	-98 (-10.8)	-93 (-10.2)	-94 (-10.3)	-87 (-9.6)
May	---	-106 (-6.4)	-123 (-7.5)	-122 (-7.4)	-116 (-7.1)	-122 (-7.4)	-122 (-7.4)	-112 (-6.8)
Jun	---	-124 (-4.8)	-142 (-5.5)	-141 (-5.5)	-139 (-5.4)	-142 (-5.5)	-138 (-5.4)	-129 (-5.0)
Jul	---	-94 (-5.4)	-111 (-6.4)	-119 (-6.9)	-125 (-7.2)	-113 (-6.5)	-112 (-6.5)	-87 (-5.0)
Aug	---	-38 (-3.2)	-47 (-3.9)	-44 (-3.7)	-48 (-4.0)	-46 (-3.9)	-47 (-3.9)	-43 (-3.6)
Sep	---	-31 (-5.3)	-35 (-6.0)	-34 (-5.8)	-36 (-6.2)	-36 (-6.2)	-38 (-6.5)	-29 (-5.0)
Oct	---	-29 (-5.5)	-44 (-8.3)	-41 (-7.7)	-34 (-6.4)	-43 (-8.1)	-43 (-8.1)	-36 (-6.8)
Nov	---	9 (1.8)	4 (0.8)	3 (0.6)	5 (1.0)	4 (0.8)	1 (0.2)	6 (1.2)
Dec	---	47 (12.0)	46 (11.8)	47 (12.0)	45 (11.5)	46 (11.8)	44 (11.3)	48 (12.3)
Average	---	-29 (-3.0)	-37 (-3.9)	-37 (-3.9)	-38 (-4.0)	-37 (-3.9)	-38 (-4.0)	-30 (-3.1)

Table 97. Monthly Streamflow Normal Year (2005) – Arkansas River near Avondale (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	347	360	374	373	373	372	359	363
Feb	260	383	398	398	395	398	366	377
Mar	380	448	454	445	447	448	438	456
Apr	676	718	717	717	713	715	711	721
May	1,428	1,282	1,275	1,274	1,279	1,275	1,272	1,282
Jun	1,575	1,550	1,524	1,522	1,522	1,521	1,551	1,545
Jul	958	934	920	920	921	920	920	931
Aug	775	758	801	800	798	804	775	789
Sep	317	293	290	291	289	290	287	296
Oct	465	374	372	372	374	370	362	372
Nov	346	313	310	310	311	310	308	314
Dec	264	254	251	251	251	251	251	255
Average	652	640	642	641	641	641	635	643
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	14 (3.9)	13 (3.6)	13 (3.6)	12 (3.3)	-1 (-0.3)	3 (0.8)
Feb	---	---	15 (3.9)	15 (3.9)	12 (3.1)	15 (3.9)	-17 (-4.4)	-6 (-1.6)
Mar	---	---	6 (1.3)	-3 (-0.7)	-1 (-0.2)	0 (0.0)	-10 (-2.2)	8 (1.8)
Apr	---	---	-1 (-0.1)	-1 (-0.1)	-5 (-0.7)	-3 (-0.4)	-7 (-1.0)	3 (0.4)
May	---	---	-7 (-0.5)	-8 (-0.6)	-3 (-0.2)	-7 (-0.5)	-10 (-0.8)	0 (0.0)
Jun	---	---	-26 (-1.7)	-28 (-1.8)	-28 (-1.8)	-29 (-1.9)	1 (0.1)	-5 (-0.3)
Jul	---	---	-14 (-1.5)	-14 (-1.5)	-13 (-1.4)	-14 (-1.5)	-14 (-1.5)	-3 (-0.3)
Aug	---	---	43 (5.7)	42 (5.5)	40 (5.3)	46 (6.1)	17 (2.2)	31 (4.1)
Sep	---	---	-3 (-1.0)	-2 (-0.7)	-4 (-1.4)	-3 (-1.0)	-6 (-2.0)	3 (1.0)
Oct	---	---	-2 (-0.5)	-2 (-0.5)	0 (0.0)	-4 (-1.1)	-12 (-3.2)	-2 (-0.5)
Nov	---	---	-3 (-1.0)	-3 (-1.0)	-2 (-0.6)	-3 (-1.0)	-5 (-1.6)	1 (0.3)
Dec	---	---	-3 (-1.2)	-3 (-1.2)	-3 (-1.2)	-3 (-1.2)	-3 (-1.2)	1 (0.4)
Average	---	---	2 (0.3)	1 (0.2)	1 (0.2)	1 (0.2)	-5 (-0.8)	3 (0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	13 (3.7)	27 (7.8)	26 (7.5)	26 (7.5)	25 (7.2)	12 (3.5)	16 (4.6)
Feb	---	123 (47.3)	138 (53.1)	138 (53.1)	135 (51.9)	138 (53.1)	106 (40.8)	117 (45.0)
Mar	---	68 (17.9)	74 (19.5)	65 (17.1)	67 (17.6)	68 (17.9)	58 (15.3)	76 (20.0)
Apr	---	42 (6.2)	41 (6.1)	41 (6.1)	37 (5.5)	39 (5.8)	35 (5.2)	45 (6.7)
May	---	-146 (-10.2)	-153 (-10.7)	-154 (-10.8)	-149 (-10.4)	-153 (-10.7)	-156 (-10.9)	-146 (-10.2)
Jun	---	-25 (-1.6)	-51 (-3.2)	-53 (-3.4)	-53 (-3.4)	-54 (-3.4)	-24 (-1.5)	-30 (-1.9)
Jul	---	-24 (-2.5)	-38 (-4.0)	-38 (-4.0)	-37 (-3.9)	-38 (-4.0)	-38 (-4.0)	-27 (-2.8)
Aug	---	-17 (-2.2)	26 (3.4)	25 (3.2)	23 (3.0)	29 (3.7)	0 (0.0)	14 (1.8)
Sep	---	-24 (-7.6)	-27 (-8.5)	-26 (-8.2)	-28 (-8.8)	-27 (-8.5)	-30 (-9.5)	-21 (-6.6)
Oct	---	-91 (-19.6)	-93 (-20.0)	-93 (-20.0)	-91 (-19.6)	-95 (-20.4)	-103 (-22.2)	-93 (-20.0)
Nov	---	-33 (-9.5)	-36 (-10.4)	-36 (-10.4)	-35 (-10.1)	-36 (-10.4)	-38 (-11.0)	-32 (-9.2)
Dec	---	-10 (-3.8)	-13 (-4.9)	-13 (-4.9)	-13 (-4.9)	-13 (-4.9)	-13 (-4.9)	-9 (-3.4)
Average	---	-12 (-1.8)	-10 (-1.5)	-11 (-1.7)	-11 (-1.7)	-11 (-1.7)	-17 (-2.6)	-9 (-1.4)

Table 98. Monthly Streamflow Wet Year (1997) – Arkansas River near Avondale (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	391	435	431	430	430	431	430	431
Feb	399	419	420	419	417	420	418	423
Mar	731	672	664	664	668	660	664	673
Apr	1,173	1,093	1,091	1,092	1,090	1,090	1,092	1,098
May	1,662	1,575	1,578	1,579	1,571	1,579	1,577	1,588
Jun	5,067	5,035	5,033	5,044	5,041	5,044	5,045	5,022
Jul	1,629	1,563	1,557	1,555	1,553	1,555	1,556	1,580
Aug	1,613	1,563	1,563	1,564	1,557	1,564	1,562	1,585
Sep	712	598	597	595	594	602	589	596
Oct	683	560	560	561	561	560	548	558
Nov	853	929	904	906	931	906	916	918
Dec	590	648	644	644	645	643	642	646
Average	1,292	1,257	1,253	1,254	1,255	1,254	1,253	1,260
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-4 (-0.9)	-5 (-1.1)	-5 (-1.1)	-4 (-0.9)	-5 (-1.1)	-4 (-0.9)
Feb	---	---	1 (0.2)	0 (0.0)	-2 (-0.5)	1 (0.2)	-1 (-0.2)	4 (1.0)
Mar	---	---	-8 (-1.2)	-8 (-1.2)	-4 (-0.6)	-12 (-1.8)	-8 (-1.2)	1 (0.1)
Apr	---	---	-2 (-0.2)	-1 (-0.1)	-3 (-0.3)	-3 (-0.3)	-1 (-0.1)	5 (0.5)
May	---	---	3 (0.2)	4 (0.3)	-4 (-0.3)	4 (0.3)	2 (0.1)	13 (0.8)
Jun	---	---	-2 (0.0)	9 (0.2)	6 (0.1)	9 (0.2)	10 (0.2)	-13 (-0.3)
Jul	---	---	-6 (-0.4)	-8 (-0.5)	-10 (-0.6)	-8 (-0.5)	-7 (-0.4)	17 (1.1)
Aug	---	---	0 (0.0)	1 (0.1)	-6 (-0.4)	1 (0.1)	-1 (-0.1)	22 (1.4)
Sep	---	---	-1 (-0.2)	-3 (-0.5)	-4 (-0.7)	4 (0.7)	-9 (-1.5)	-2 (-0.3)
Oct	---	---	0 (0.0)	1 (0.2)	1 (0.2)	0 (0.0)	-12 (-2.1)	-2 (-0.4)
Nov	---	---	-25 (-2.7)	-23 (-2.5)	2 (0.2)	-23 (-2.5)	-13 (-1.4)	-11 (-1.2)
Dec	---	---	-4 (-0.6)	-4 (-0.6)	-3 (-0.5)	-5 (-0.8)	-6 (-0.9)	-2 (-0.3)
Average	---	---	-4 (-0.3)	-3 (-0.2)	-2 (-0.2)	-3 (-0.2)	-4 (-0.3)	3 (0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	44 (11.3)	40 (10.2)	39 (10.0)	39 (10.0)	40 (10.2)	39 (10.0)	40 (10.2)
Feb	---	20 (5.0)	21 (5.3)	20 (5.0)	18 (4.5)	21 (5.3)	19 (4.8)	24 (6.0)
Mar	---	-59 (-8.1)	-67 (-9.2)	-67 (-9.2)	-63 (-8.6)	-71 (-9.7)	-67 (-9.2)	-58 (-7.9)
Apr	---	-80 (-6.8)	-82 (-7.0)	-81 (-6.9)	-83 (-7.1)	-83 (-7.1)	-81 (-6.9)	-75 (-6.4)
May	---	-87 (-5.2)	-84 (-5.1)	-83 (-5.0)	-91 (-5.5)	-83 (-5.0)	-85 (-5.1)	-74 (-4.5)
Jun	---	-32 (-0.6)	-34 (-0.7)	-23 (-0.5)	-26 (-0.5)	-23 (-0.5)	-22 (-0.4)	-45 (-0.9)
Jul	---	-66 (-4.1)	-72 (-4.4)	-74 (-4.5)	-76 (-4.7)	-74 (-4.5)	-73 (-4.5)	-49 (-3.0)
Aug	---	-50 (-3.1)	-50 (-3.1)	-49 (-3.0)	-56 (-3.5)	-49 (-3.0)	-51 (-3.2)	-28 (-1.7)
Sep	---	-114 (-16.0)	-115 (-16.2)	-117 (-16.4)	-118 (-16.6)	-110 (-15.4)	-123 (-17.3)	-116 (-16.3)
Oct	---	-123 (-18.0)	-123 (-18.0)	-122 (-17.9)	-122 (-17.9)	-123 (-18.0)	-135 (-19.8)	-125 (-18.3)
Nov	---	76 (8.9)	51 (6.0)	53 (6.2)	78 (9.1)	53 (6.2)	63 (7.4)	65 (7.6)
Dec	---	58 (9.8)	54 (9.2)	54 (9.2)	55 (9.3)	53 (9.0)	52 (8.8)	56 (9.5)
Average	---	-35 (-2.7)	-39 (-3.0)	-38 (-2.9)	-37 (-2.9)	-38 (-2.9)	-39 (-3.0)	-32 (-2.5)

Table 99. Monthly Streamflow Dry Year (2004) – Arkansas River near Avondale (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	258	367	372	372	369	372	365	370
Feb	334	388	392	392	387	392	388	392
Mar	356	380	390	390	378	390	386	397
Apr	716	678	681	681	675	681	673	677
May	1,072	817	794	795	805	795	821	802
Jun	1,262	1,120	1,100	1,101	1,117	1,106	1,095	1,110
Jul	1,003	944	936	935	940	934	916	944
Aug	729	691	692	692	691	691	686	693
Sep	263	260	254	254	255	256	248	259
Oct	318	328	303	304	313	303	316	324
Nov	392	400	391	391	396	391	391	396
Dec	318	317	318	318	316	319	317	322
Average	586	558	553	553	554	553	551	558
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	5 (1.4)	5 (1.4)	2 (0.5)	5 (1.4)	-2 (-0.5)	3 (0.8)
Feb	---	---	4 (1.0)	4 (1.0)	-1 (-0.3)	4 (1.0)	0 (0.0)	4 (1.0)
Mar	---	---	10 (2.6)	10 (2.6)	-2 (-0.5)	10 (2.6)	6 (1.6)	17 (4.5)
Apr	---	---	3 (0.4)	3 (0.4)	-3 (-0.4)	3 (0.4)	-5 (-0.7)	-1 (-0.1)
May	---	---	-23 (-2.8)	-22 (-2.7)	-12 (-1.5)	-22 (-2.7)	4 (0.5)	-15 (-1.8)
Jun	---	---	-20 (-1.8)	-19 (-1.7)	-3 (-0.3)	-14 (-1.3)	-25 (-2.2)	-10 (-0.9)
Jul	---	---	-8 (-0.8)	-9 (-1.0)	-4 (-0.4)	-10 (-1.1)	-28 (-3.0)	0 (0.0)
Aug	---	---	1 (0.1)	1 (0.1)	0 (0.0)	0 (0.0)	-5 (-0.7)	2 (0.3)
Sep	---	---	-6 (-2.3)	-6 (-2.3)	-5 (-1.9)	-4 (-1.5)	-12 (-4.6)	-1 (-0.4)
Oct	---	---	-25 (-7.6)	-24 (-7.3)	-15 (-4.6)	-25 (-7.6)	-12 (-3.7)	-4 (-1.2)
Nov	---	---	-9 (-2.3)	-9 (-2.3)	-4 (-1.0)	-9 (-2.3)	-9 (-2.3)	-4 (-1.0)
Dec	---	---	1 (0.3)	1 (0.3)	-1 (-0.3)	2 (0.6)	0 (0.0)	5 (1.6)
Average	---	---	-5 (-0.9)	-5 (-0.9)	-4 (-0.7)	-5 (-0.9)	-7 (-1.3)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	109 (42.2)	114 (44.2)	114 (44.2)	111 (43.0)	114 (44.2)	107 (41.5)	112 (43.4)
Feb	---	54 (16.2)	58 (17.4)	58 (17.4)	53 (15.9)	58 (17.4)	54 (16.2)	58 (17.4)
Mar	---	24 (6.7)	34 (9.6)	34 (9.6)	22 (6.2)	34 (9.6)	30 (8.4)	41 (11.5)
Apr	---	-38 (-5.3)	-35 (-4.9)	-35 (-4.9)	-41 (-5.7)	-35 (-4.9)	-43 (-6.0)	-39 (-5.4)
May	---	-255 (-23.8)	-278 (-25.9)	-277 (-25.8)	-267 (-24.9)	-277 (-25.8)	-251 (-23.4)	-270 (-25.2)
Jun	---	-142 (-11.3)	-162 (-12.8)	-161 (-12.8)	-145 (-11.5)	-156 (-12.4)	-167 (-13.2)	-152 (-12.0)
Jul	---	-59 (-5.9)	-67 (-6.7)	-68 (-6.8)	-63 (-6.3)	-69 (-6.9)	-87 (-8.7)	-59 (-5.9)
Aug	---	-38 (-5.2)	-37 (-5.1)	-37 (-5.1)	-38 (-5.2)	-38 (-5.2)	-43 (-5.9)	-36 (-4.9)
Sep	---	-3 (-1.1)	-9 (-3.4)	-9 (-3.4)	-8 (-3.0)	-7 (-2.7)	-15 (-5.7)	-4 (-1.5)
Oct	---	10 (3.1)	-15 (-4.7)	-14 (-4.4)	-5 (-1.6)	-15 (-4.7)	-2 (-0.6)	6 (1.9)
Nov	---	8 (2.0)	-1 (-0.3)	-1 (-0.3)	4 (1.0)	-1 (-0.3)	-1 (-0.3)	4 (1.0)
Dec	---	-1 (-0.3)	0 (0.0)	0 (0.0)	-2 (-0.6)	1 (0.3)	-1 (-0.3)	4 (1.3)
Average	---	-28 (-4.8)	-33 (-5.6)	-33 (-5.6)	-32 (-5.5)	-33 (-5.6)	-35 (-6.0)	-28 (-4.8)

Arkansas River near Rocky Ford Gage

The Arkansas River near Rocky Ford gage is located just upstream of where the Rocky Ford group's return flows would come back to the river. This is midway between the AVC participants' simulation points. At this location, streamflow begins to be more similar to the No Action Alternative because most exchanges are occurring upstream. Also, half of the AVC participants' return flows have returned to the river by this point.

Mean monthly simulated direct effects streamflow analysis at the Rocky Ford gage is shown in Table 100 through Table 103. Effects on streamflow are negligible during most months, with a few months having minor increases or decreases in flow. October has the largest percentage increase in flow compared to the No Action for all action alternatives with a Master Contract, particularly in the typical dry year of 2004 (Table 103). Alternatives without their own Master Contract, such as the No Action and the Joint Use Pipeline North Alternative rely more heavily on Super-Ditch leases from LAVWCD. Exchanges of Super Ditch downstream of Rocky Ford to LAVWCD's excess capacity contract are greater for these alternatives, reducing streamflow. Alternatives with a Master Contract show greater flow in this reach, especially during dry years. Simulated streamflow at the Rocky Ford gage for Cumulative Effects is shown in Table 104 through Table 107. All months have negligible to minor effects. The typical dry year of 2004 and the typical normal year of 2005 show increased flows compared to the No Action in the month of February for all alternatives except the River South and Master Contract Only. These are due to the timing of diversions into Colorado Canal which change based on operations at Pueblo.

Table 100. Overall Average Monthly Streamflow – Arkansas River near Rocky Ford (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	132	138	138	138	136	138	138	140
Feb	189	197	195	195	197	195	195	196
Mar	223	239	225	225	231	225	228	227
Apr	427	432	442	442	425	442	441	451
May	976	994	990	989	987	991	991	998
Jun	1,521	1,527	1,521	1,521	1,520	1,521	1,522	1,537
Jul	969	979	971	965	945	972	975	981
Aug	642	648	639	642	648	638	638	649
Sep	242	255	249	249	250	249	249	254
Oct	257	251	258	259	248	258	259	261
Nov	251	255	254	254	253	254	254	256
Dec	95	104	102	102	103	102	102	104
Average	495	502	500	499	496	500	500	505
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	-2 (-1.4)	0 (0.0)	0 (0.0)	2 (1.4)
Feb	---	---	-2 (-1.0)	-2 (-1.0)	0 (0.0)	-2 (-1.0)	-2 (-1.0)	-1 (-0.5)
Mar	---	---	-14 (-5.9)	-14 (-5.9)	-8 (-3.3)	-14 (-5.9)	-11 (-4.6)	-12 (-5.0)
Apr	---	---	10 (2.3)	10 (2.3)	-7 (-1.6)	10 (2.3)	9 (2.1)	19 (4.4)
May	---	---	-4 (-0.4)	-5 (-0.5)	-7 (-0.7)	-3 (-0.3)	-3 (-0.3)	4 (0.4)
Jun	---	---	-6 (-0.4)	-6 (-0.4)	-7 (-0.5)	-6 (-0.4)	-5 (-0.3)	10 (0.7)
Jul	---	---	-8 (-0.8)	-14 (-1.4)	-34 (-3.5)	-7 (-0.7)	-4 (-0.4)	2 (0.2)
Aug	---	---	-9 (-1.4)	-6 (-0.9)	0 (0.0)	-10 (-1.5)	-10 (-1.5)	1 (0.2)
Sep	---	---	-6 (-2.4)	-6 (-2.4)	-5 (-2.0)	-6 (-2.4)	-6 (-2.4)	-1 (-0.4)
Oct	---	---	7 (2.8)	8 (3.2)	-3 (-1.2)	7 (2.8)	8 (3.2)	10 (4.0)
Nov	---	---	-1 (-0.4)	-1 (-0.4)	-2 (-0.8)	-1 (-0.4)	-1 (-0.4)	1 (0.4)
Dec	---	---	-2 (-1.9)	-2 (-1.9)	-1 (-1.0)	-2 (-1.9)	-2 (-1.9)	0 (0.0)
Average	---	---	-2 (-0.4)	-3 (-0.6)	-6 (-1.2)	-2 (-0.4)	-2 (-0.4)	3 (0.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	6 (4.5)	6 (4.5)	6 (4.5)	4 (3.0)	6 (4.5)	6 (4.5)	8 (6.1)
Feb	---	8 (4.2)	6 (3.2)	6 (3.2)	8 (4.2)	6 (3.2)	6 (3.2)	7 (3.7)
Mar	---	16 (7.2)	2 (0.9)	2 (0.9)	8 (3.6)	2 (0.9)	5 (2.2)	4 (1.8)
Apr	---	5 (1.2)	15 (3.5)	15 (3.5)	-2 (-0.5)	15 (3.5)	14 (3.3)	24 (5.6)
May	---	18 (1.8)	14 (1.4)	13 (1.3)	11 (1.1)	15 (1.5)	15 (1.5)	22 (2.3)
Jun	---	6 (0.4)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	1 (0.1)	16 (1.1)
Jul	---	10 (1.0)	2 (0.2)	-4 (-0.4)	-24 (-2.5)	3 (0.3)	6 (0.6)	12 (1.2)
Aug	---	6 (0.9)	-3 (-0.5)	0 (0.0)	6 (0.9)	-4 (-0.6)	-4 (-0.6)	7 (1.1)
Sep	---	13 (5.4)	7 (2.9)	7 (2.9)	8 (3.3)	7 (2.9)	7 (2.9)	12 (5.0)
Oct	---	-6 (-2.3)	1 (0.4)	2 (0.8)	-9 (-3.5)	1 (0.4)	2 (0.8)	4 (1.6)
Nov	---	4 (1.6)	3 (1.2)	3 (1.2)	2 (0.8)	3 (1.2)	3 (1.2)	5 (2.0)
Dec	---	9 (9.5)	7 (7.4)	7 (7.4)	8 (8.4)	7 (7.4)	7 (7.4)	9 (9.5)
Average	---	8 (1.6)	5 (1.0)	5 (1.0)	2 (0.4)	5 (1.0)	6 (1.2)	11 (2.2)

Table 101. Monthly Streamflow Normal Year (2005) – Arkansas River near Rocky Ford (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	125	114	115	115	113	115	116	117
Feb	237	228	223	230	228	224	230	226
Mar	166	170	170	171	170	170	169	171
Apr	453	482	478	478	478	478	479	482
May	766	770	771	770	765	771	765	776
Jun	939	964	951	950	959	951	953	964
Jul	851	866	854	854	860	854	855	863
Aug	569	582	571	571	577	571	572	578
Sep	122	130	126	127	126	126	126	128
Oct	193	180	188	188	176	188	191	192
Nov	102	108	110	110	107	110	111	112
Dec	23	27	26	26	26	26	26	28
Average	380	386	383	383	383	383	384	387
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	1 (0.9)	1 (0.9)	-1 (-0.9)	1 (0.9)	2 (1.8)	3 (2.6)
Feb	---	---	-5 (-2.2)	2 (0.9)	0 (0.0)	-4 (-1.8)	2 (0.9)	-2 (-0.9)
Mar	---	---	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	-1 (-0.6)	1 (0.6)
Apr	---	---	-4 (-0.8)	-4 (-0.8)	-4 (-0.8)	-4 (-0.8)	-3 (-0.6)	0 (0.0)
May	---	---	1 (0.1)	0 (0.0)	-5 (-0.6)	1 (0.1)	-5 (-0.6)	6 (0.8)
Jun	---	---	-13 (-1.3)	-14 (-1.5)	-5 (-0.5)	-13 (-1.3)	-11 (-1.1)	0 (0.0)
Jul	---	---	-12 (-1.4)	-12 (-1.4)	-6 (-0.7)	-12 (-1.4)	-11 (-1.3)	-3 (-0.3)
Aug	---	---	-11 (-1.9)	-11 (-1.9)	-5 (-0.9)	-11 (-1.9)	-10 (-1.7)	-4 (-0.7)
Sep	---	---	-4 (-3.1)	-3 (-2.3)	-4 (-3.1)	-4 (-3.1)	-4 (-3.1)	-2 (-1.5)
Oct	---	---	8 (4.4)	8 (4.4)	-4 (-2.2)	8 (4.4)	11 (6.1)	12 (6.7)
Nov	---	---	2 (1.9)	2 (1.9)	-1 (-0.9)	2 (1.9)	3 (2.8)	4 (3.7)
Dec	---	---	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	1 (3.7)
Average	---	---	-3 (-0.8)	-3 (-0.8)	-3 (-0.8)	-3 (-0.8)	-2 (-0.5)	1 (0.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-11 (-8.8)	-10 (-8.0)	-10 (-8.0)	-12 (-9.6)	-10 (-8.0)	-9 (-7.2)	-8 (-6.4)
Feb	---	-9 (-3.8)	-14 (-5.9)	-7 (-3.0)	-9 (-3.8)	-13 (-5.5)	-7 (-3.0)	-11 (-4.6)
Mar	---	4 (2.4)	4 (2.4)	5 (3.0)	4 (2.4)	4 (2.4)	3 (1.8)	5 (3.0)
Apr	---	29 (6.4)	25 (5.5)	25 (5.5)	25 (5.5)	25 (5.5)	26 (5.7)	29 (6.4)
May	---	4 (0.5)	5 (0.7)	4 (0.5)	-1 (-0.1)	5 (0.7)	-1 (-0.1)	10 (1.3)
Jun	---	25 (2.7)	12 (1.3)	11 (1.2)	20 (2.1)	12 (1.3)	14 (1.5)	25 (2.7)
Jul	---	15 (1.8)	3 (0.4)	3 (0.4)	9 (1.1)	3 (0.4)	4 (0.5)	12 (1.4)
Aug	---	13 (2.3)	2 (0.4)	2 (0.4)	8 (1.4)	2 (0.4)	3 (0.5)	9 (1.6)
Sep	---	8 (6.6)	4 (3.3)	5 (4.1)	4 (3.3)	4 (3.3)	4 (3.3)	6 (4.9)
Oct	---	-13 (-6.7)	-5 (-2.6)	-5 (-2.6)	-17 (-8.8)	-5 (-2.6)	-2 (-1.0)	-1 (-0.5)
Nov	---	6 (5.9)	8 (7.8)	8 (7.8)	5 (4.9)	8 (7.8)	9 (8.8)	10 (9.8)
Dec	---	4 (17.4)	3 (13.0)	3 (13.0)	3 (13.0)	3 (13.0)	3 (13.0)	5 (21.7)
Average	---	6 (1.6)	3 (0.8)	3 (0.8)	3 (0.8)	3 (0.8)	4 (1.1)	7 (1.8)

Table 102. Monthly Streamflow Wet Year (1997) – Arkansas River near Rocky Ford (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	63	72	70	70	68	70	72	72
Feb	265	272	270	270	270	270	270	272
Mar	312	326	318	318	323	318	318	320
Apr	376	396	393	393	392	393	393	397
May	779	798	805	805	792	805	805	810
Jun	3,244	3,249	3,265	3,265	3,242	3,265	3,265	3,271
Jul	618	629	637	638	622	638	637	640
Aug	1,397	1,407	1,401	1,401	1,401	1,401	1,401	1,407
Sep	330	343	335	335	348	334	335	339
Oct	327	320	329	329	318	329	329	331
Nov	420	419	423	423	417	423	422	424
Dec	550	565	563	563	565	563	561	564
Average	723	733	734	734	729	734	734	737
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-2 (-2.8)	-2 (-2.8)	-4 (-5.6)	-2 (-2.8)	0 (0.0)	0 (0.0)
Feb	---	---	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	0 (0.0)
Mar	---	---	-8 (-2.5)	-8 (-2.5)	-3 (-0.9)	-8 (-2.5)	-8 (-2.5)	-6 (-1.8)
Apr	---	---	-3 (-0.8)	-3 (-0.8)	-4 (-1.0)	-3 (-0.8)	-3 (-0.8)	1 (0.3)
May	---	---	7 (0.9)	7 (0.9)	-6 (-0.8)	7 (0.9)	7 (0.9)	12 (1.5)
Jun	---	---	16 (0.5)	16 (0.5)	-7 (-0.2)	16 (0.5)	16 (0.5)	22 (0.7)
Jul	---	---	8 (1.3)	9 (1.4)	-7 (-1.1)	9 (1.4)	8 (1.3)	11 (1.7)
Aug	---	---	-6 (-0.4)	-6 (-0.4)	-6 (-0.4)	-6 (-0.4)	-6 (-0.4)	0 (0.0)
Sep	---	---	-8 (-2.3)	-8 (-2.3)	5 (1.5)	-9 (-2.6)	-8 (-2.3)	-4 (-1.2)
Oct	---	---	9 (2.8)	9 (2.8)	-2 (-0.6)	9 (2.8)	9 (2.8)	11 (3.4)
Nov	---	---	4 (1.0)	4 (1.0)	-2 (-0.5)	4 (1.0)	3 (0.7)	5 (1.2)
Dec	---	---	-2 (-0.4)	-2 (-0.4)	0 (0.0)	-2 (-0.4)	-4 (-0.7)	-1 (-0.2)
Average	---	---	1 (0.1)	1 (0.1)	-4 (-0.5)	1 (0.1)	1 (0.1)	4 (0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	9 (14.3)	7 (11.1)	7 (11.1)	5 (7.9)	7 (11.1)	9 (14.3)	9 (14.3)
Feb	---	7 (2.6)	5 (1.9)	5 (1.9)	5 (1.9)	5 (1.9)	5 (1.9)	7 (2.6)
Mar	---	14 (4.5)	6 (1.9)	6 (1.9)	11 (3.5)	6 (1.9)	6 (1.9)	8 (2.6)
Apr	---	20 (5.3)	17 (4.5)	17 (4.5)	16 (4.3)	17 (4.5)	17 (4.5)	21 (5.6)
May	---	19 (2.4)	26 (3.3)	26 (3.3)	13 (1.7)	26 (3.3)	26 (3.3)	31 (4.0)
Jun	---	5 (0.2)	21 (0.6)	21 (0.6)	-2 (-0.1)	21 (0.6)	21 (0.6)	27 (0.8)
Jul	---	11 (1.8)	19 (3.1)	20 (3.2)	4 (0.6)	20 (3.2)	19 (3.1)	22 (3.6)
Aug	---	10 (0.7)	4 (0.3)	4 (0.3)	4 (0.3)	4 (0.3)	4 (0.3)	10 (0.7)
Sep	---	13 (3.9)	5 (1.5)	5 (1.5)	18 (5.5)	4 (1.2)	5 (1.5)	9 (2.7)
Oct	---	-7 (-2.1)	2 (0.6)	2 (0.6)	-9 (-2.8)	2 (0.6)	2 (0.6)	4 (1.2)
Nov	---	-1 (-0.2)	3 (0.7)	3 (0.7)	-3 (-0.7)	3 (0.7)	2 (0.5)	4 (1.0)
Dec	---	15 (2.7)	13 (2.4)	13 (2.4)	15 (2.7)	13 (2.4)	11 (2.0)	14 (2.5)
Average	---	10 (1.4)	11 (1.5)	11 (1.5)	6 (0.8)	11 (1.5)	11 (1.5)	14 (1.9)

Table 103. Monthly Streamflow Dry Year (2004) – Arkansas River near Rocky Ford (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	53	55	56	56	54	56	56	58
Feb	59	61	60	60	59	60	60	62
Mar	143	149	145	148	152	145	139	154
Apr	465	448	445	445	442	447	446	448
May	760	802	792	790	797	792	797	802
Jun	907	923	918	918	919	918	918	923
Jul	716	728	724	724	725	724	724	728
Aug	392	402	402	402	399	400	401	405
Sep	125	125	127	127	123	128	125	128
Oct	147	150	161	161	147	162	164	163
Nov	223	225	227	227	223	226	226	228
Dec	112	117	115	116	115	116	116	118
Average	343	350	349	349	348	349	349	353
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	1 (1.8)	1 (1.8)	-1 (-1.8)	1 (1.8)	1 (1.8)	3 (5.5)
Feb	---	---	-1 (-1.6)	-1 (-1.6)	-2 (-3.3)	-1 (-1.6)	-1 (-1.6)	1 (1.6)
Mar	---	---	-4 (-2.7)	-1 (-0.7)	3 (2.0)	-4 (-2.7)	-10 (-6.7)	5 (3.4)
Apr	---	---	-3 (-0.7)	-3 (-0.7)	-6 (-1.3)	-1 (-0.2)	-2 (-0.4)	0 (0.0)
May	---	---	-10 (-1.2)	-12 (-1.5)	-5 (-0.6)	-10 (-1.2)	-5 (-0.6)	0 (0.0)
Jun	---	---	-5 (-0.5)	-5 (-0.5)	-4 (-0.4)	-5 (-0.5)	-5 (-0.5)	0 (0.0)
Jul	---	---	-4 (-0.5)	-4 (-0.5)	-3 (-0.4)	-4 (-0.5)	-4 (-0.5)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	-3 (-0.7)	-2 (-0.5)	-1 (-0.2)	3 (0.7)
Sep	---	---	2 (1.6)	2 (1.6)	-2 (-1.6)	3 (2.4)	0 (0.0)	3 (2.4)
Oct	---	---	11 (7.3)	11 (7.3)	-3 (-2.0)	12 (8.0)	14 (9.3)	13 (8.7)
Nov	---	---	2 (0.9)	2 (0.9)	-2 (-0.9)	1 (0.4)	1 (0.4)	3 (1.3)
Dec	---	---	-2 (-1.7)	-1 (-0.9)	-2 (-1.7)	-1 (-0.9)	-1 (-0.9)	1 (0.9)
Average	---	---	-1 (-0.3)	-1 (-0.3)	-2 (-0.6)	-1 (-0.3)	-1 (-0.3)	3 (0.9)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	2 (3.8)	3 (5.7)	3 (5.7)	1 (1.9)	3 (5.7)	3 (5.7)	5 (9.4)
Feb	---	2 (3.4)	1 (1.7)	1 (1.7)	0 (0.0)	1 (1.7)	1 (1.7)	3 (5.1)
Mar	---	6 (4.2)	2 (1.4)	5 (3.5)	9 (6.3)	2 (1.4)	-4 (-2.8)	11 (7.7)
Apr	---	-17 (-3.7)	-20 (-4.3)	-20 (-4.3)	-23 (-4.9)	-18 (-3.9)	-19 (-4.1)	-17 (-3.7)
May	---	42 (5.5)	32 (4.2)	30 (3.9)	37 (4.9)	32 (4.2)	37 (4.9)	42 (5.5)
Jun	---	16 (1.8)	11 (1.2)	11 (1.2)	12 (1.3)	11 (1.2)	11 (1.2)	16 (1.8)
Jul	---	12 (1.7)	8 (1.1)	8 (1.1)	9 (1.3)	8 (1.1)	8 (1.1)	12 (1.7)
Aug	---	10 (2.6)	10 (2.6)	10 (2.6)	7 (1.8)	8 (2.0)	9 (2.3)	13 (3.3)
Sep	---	0 (0.0)	2 (1.6)	2 (1.6)	-2 (-1.6)	3 (2.4)	0 (0.0)	3 (2.4)
Oct	---	3 (2.0)	14 (9.5)	14 (9.5)	0 (0.0)	15 (10.2)	17 (11.6)	16 (10.9)
Nov	---	2 (0.9)	4 (1.8)	4 (1.8)	0 (0.0)	3 (1.3)	3 (1.3)	5 (2.2)
Dec	---	5 (4.5)	3 (2.7)	4 (3.6)	3 (2.7)	4 (3.6)	4 (3.6)	6 (5.4)
Average	---	7 (2.0)	6 (1.7)	6 (1.7)	5 (1.5)	6 (1.7)	6 (1.7)	10 (2.9)

Table 104. Overall Average Monthly Streamflow – Arkansas River near Rocky Ford (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	132	140	138	138	139	138	138	140
Feb	189	208	210	210	211	211	204	207
Mar	223	237	234	234	235	234	234	236
Apr	427	403	399	398	396	399	396	401
May	976	983	973	973	971	973	973	984
Jun	1,521	1,484	1,483	1,483	1,476	1,483	1,483	1,488
Jul	969	929	920	917	917	919	921	935
Aug	642	661	657	658	654	657	654	660
Sep	242	261	257	256	256	257	257	261
Oct	257	261	263	265	258	265	264	265
Nov	251	256	256	256	256	256	256	257
Dec	95	101	99	99	99	99	99	101
Average	495	494	492	491	490	492	491	495
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-2 (-1.4)	-2 (-1.4)	-1 (-0.7)	-2 (-1.4)	-2 (-1.4)	0 (0.0)
Feb	---	---	2 (1.0)	2 (1.0)	3 (1.4)	3 (1.4)	-4 (-1.9)	-1 (-0.5)
Mar	---	---	-3 (-1.3)	-3 (-1.3)	-2 (-0.8)	-3 (-1.3)	-3 (-1.3)	-1 (-0.4)
Apr	---	---	-4 (-1.0)	-5 (-1.2)	-7 (-1.7)	-4 (-1.0)	-7 (-1.7)	-2 (-0.5)
May	---	---	-10 (-1.0)	-10 (-1.0)	-12 (-1.2)	-10 (-1.0)	-10 (-1.0)	1 (0.1)
Jun	---	---	-1 (-0.1)	-1 (-0.1)	-8 (-0.5)	-1 (-0.1)	-1 (-0.1)	4 (0.3)
Jul	---	---	-9 (-1.0)	-12 (-1.3)	-12 (-1.3)	-10 (-1.1)	-8 (-0.9)	6 (0.6)
Aug	---	---	-4 (-0.6)	-3 (-0.5)	-7 (-1.1)	-4 (-0.6)	-7 (-1.1)	-1 (-0.2)
Sep	---	---	-4 (-1.5)	-5 (-1.9)	-5 (-1.9)	-4 (-1.5)	-4 (-1.5)	0 (0.0)
Oct	---	---	2 (0.8)	4 (1.5)	-3 (-1.1)	4 (1.5)	3 (1.1)	4 (1.5)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)
Dec	---	---	-2 (-2.0)	-2 (-2.0)	-2 (-2.0)	-2 (-2.0)	-2 (-2.0)	0 (0.0)
Average	---	---	-2 (-0.4)	-3 (-0.6)	-4 (-0.8)	-2 (-0.4)	-3 (-0.6)	1 (0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	8 (6.1)	6 (4.5)	6 (4.5)	7 (5.3)	6 (4.5)	6 (4.5)	8 (6.1)
Feb	---	19 (10.1)	21 (11.1)	21 (11.1)	22 (11.6)	22 (11.6)	15 (7.9)	18 (9.5)
Mar	---	14 (6.3)	11 (4.9)	11 (4.9)	12 (5.4)	11 (4.9)	11 (4.9)	13 (5.8)
Apr	---	-24 (-5.6)	-28 (-6.6)	-29 (-6.8)	-31 (-7.3)	-28 (-6.6)	-31 (-7.3)	-26 (-6.1)
May	---	7 (0.7)	-3 (-0.3)	-3 (-0.3)	-5 (-0.5)	-3 (-0.3)	-3 (-0.3)	8 (0.8)
Jun	---	-37 (-2.4)	-38 (-2.5)	-38 (-2.5)	-45 (-3.0)	-38 (-2.5)	-38 (-2.5)	-33 (-2.2)
Jul	---	-40 (-4.1)	-49 (-5.1)	-52 (-5.4)	-52 (-5.4)	-50 (-5.2)	-48 (-5.0)	-34 (-3.5)
Aug	---	19 (3.0)	15 (2.3)	16 (2.5)	12 (1.9)	15 (2.3)	12 (1.9)	18 (2.8)
Sep	---	19 (7.9)	15 (6.2)	14 (5.8)	14 (5.8)	15 (6.2)	15 (6.2)	19 (7.9)
Oct	---	4 (1.6)	6 (2.3)	8 (3.1)	1 (0.4)	8 (3.1)	7 (2.7)	8 (3.1)
Nov	---	5 (2.0)	5 (2.0)	5 (2.0)	5 (2.0)	5 (2.0)	5 (2.0)	6 (2.4)
Dec	---	6 (6.3)	4 (4.2)	4 (4.2)	4 (4.2)	4 (4.2)	4 (4.2)	6 (6.3)
Average	---	0 (0.0)	-3 (-0.6)	-3 (-0.6)	-5 (-1.0)	-3 (-0.6)	-4 (-0.8)	1 (0.2)

Table 105. Monthly Streamflow Normal Year (2005) – Arkansas River near Rocky Ford (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	125	114	113	113	112	113	113	115
Feb	237	105	138	137	137	138	96	107
Mar	166	212	209	211	211	209	213	210
Apr	453	469	466	466	466	466	466	468
May	766	765	757	757	760	757	765	764
Jun	939	965	961	961	960	960	960	965
Jul	851	867	860	861	861	860	861	866
Aug	569	583	577	577	577	577	575	583
Sep	122	140	135	134	134	134	134	138
Oct	193	190	190	190	184	191	193	194
Nov	102	109	109	109	108	109	109	111
Dec	23	27	26	26	26	26	26	28
Average	380	381	380	380	379	380	378	381
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-0.9)	-1 (-0.9)	-2 (-1.8)	-1 (-0.9)	-1 (-0.9)	1 (0.9)
Feb	---	---	33 (31.4)	32 (30.5)	32 (30.5)	33 (31.4)	-9 (-8.6)	2 (1.9)
Mar	---	---	-3 (-1.4)	-1 (-0.5)	-1 (-0.5)	-3 (-1.4)	1 (0.5)	-2 (-0.9)
Apr	---	---	-3 (-0.6)	-3 (-0.6)	-3 (-0.6)	-3 (-0.6)	-3 (-0.6)	-1 (-0.2)
May	---	---	-8 (-1.0)	-8 (-1.0)	-5 (-0.7)	-8 (-1.0)	0 (0.0)	-1 (-0.1)
Jun	---	---	-4 (-0.4)	-4 (-0.4)	-5 (-0.5)	-5 (-0.5)	-5 (-0.5)	0 (0.0)
Jul	---	---	-7 (-0.8)	-6 (-0.7)	-6 (-0.7)	-7 (-0.8)	-6 (-0.7)	-1 (-0.1)
Aug	---	---	-6 (-1.0)	-6 (-1.0)	-6 (-1.0)	-6 (-1.0)	-8 (-1.4)	0 (0.0)
Sep	---	---	-5 (-3.6)	-6 (-4.3)	-6 (-4.3)	-6 (-4.3)	-6 (-4.3)	-2 (-1.4)
Oct	---	---	0 (0.0)	0 (0.0)	-6 (-3.2)	1 (0.5)	3 (1.6)	4 (2.1)
Nov	---	---	0 (0.0)	0 (0.0)	-1 (-0.9)	0 (0.0)	0 (0.0)	2 (1.8)
Dec	---	---	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	-1 (-3.7)	1 (3.7)
Average	---	---	-1 (-0.3)	-1 (-0.3)	-2 (-0.5)	-1 (-0.3)	-3 (-0.8)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-11 (-8.8)	-12 (-9.6)	-12 (-9.6)	-13 (-10.4)	-12 (-9.6)	-12 (-9.6)	-10 (-8.0)
Feb	---	-132 (-55.7)	-99 (-41.8)	-100 (-42.2)	-100 (-42.2)	-99 (-41.8)	-141 (-59.5)	-130 (-54.9)
Mar	---	46 (27.7)	43 (25.9)	45 (27.1)	45 (27.1)	43 (25.9)	47 (28.3)	44 (26.5)
Apr	---	16 (3.5)	13 (2.9)	13 (2.9)	13 (2.9)	13 (2.9)	13 (2.9)	15 (3.3)
May	---	-1 (-0.1)	-9 (-1.2)	-9 (-1.2)	-6 (-0.8)	-9 (-1.2)	-1 (-0.1)	-2 (-0.3)
Jun	---	26 (2.8)	22 (2.3)	22 (2.3)	21 (2.2)	21 (2.2)	21 (2.2)	26 (2.8)
Jul	---	16 (1.9)	9 (1.1)	10 (1.2)	10 (1.2)	9 (1.1)	10 (1.2)	15 (1.8)
Aug	---	14 (2.5)	8 (1.4)	8 (1.4)	8 (1.4)	8 (1.4)	6 (1.1)	14 (2.5)
Sep	---	18 (14.8)	13 (10.7)	12 (9.8)	12 (9.8)	12 (9.8)	12 (9.8)	16 (13.1)
Oct	---	-3 (-1.6)	-3 (-1.6)	-3 (-1.6)	-9 (-4.7)	-2 (-1.0)	0 (0.0)	1 (0.5)
Nov	---	7 (6.9)	7 (6.9)	7 (6.9)	6 (5.9)	7 (6.9)	7 (6.9)	9 (8.8)
Dec	---	4 (17.4)	3 (13.0)	3 (13.0)	3 (13.0)	3 (13.0)	3 (13.0)	5 (21.7)
Average	---	1 (0.3)	0 (0.0)	0 (0.0)	-1 (-0.3)	0 (0.0)	-2 (-0.5)	1 (0.3)

Table 106. Monthly Streamflow Wet Year (1997) – Arkansas River near Rocky Ford (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	63	72	71	71	70	71	71	72
Feb	265	273	271	271	271	271	271	272
Mar	312	328	324	326	326	324	324	322
Apr	376	399	393	395	396	393	395	396
May	779	798	806	806	793	806	807	812
Jun	3,244	3,251	3,266	3,266	3,245	3,266	3,266	3,272
Jul	618	630	635	631	623	631	633	649
Aug	1,397	1,408	1,402	1,402	1,402	1,402	1,407	1,416
Sep	330	359	351	351	355	353	354	357
Oct	327	344	342	342	341	342	341	346
Nov	420	419	422	422	417	422	420	423
Dec	550	562	556	556	560	556	561	557
Average	723	737	736	736	733	736	737	741
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-1.4)	-1 (-1.4)	-2 (-2.8)	-1 (-1.4)	-1 (-1.4)	0 (0.0)
Feb	---	---	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-2 (-0.7)	-1 (-0.4)
Mar	---	---	-4 (-1.2)	-2 (-0.6)	-2 (-0.6)	-4 (-1.2)	-4 (-1.2)	-6 (-1.8)
Apr	---	---	-6 (-1.5)	-4 (-1.0)	-3 (-0.8)	-6 (-1.5)	-4 (-1.0)	-3 (-0.8)
May	---	---	8 (1.0)	8 (1.0)	-5 (-0.6)	8 (1.0)	9 (1.1)	14 (1.8)
Jun	---	---	15 (0.5)	15 (0.5)	-6 (-0.2)	15 (0.5)	15 (0.5)	21 (0.6)
Jul	---	---	5 (0.8)	1 (0.2)	-7 (-1.1)	1 (0.2)	3 (0.5)	19 (3.0)
Aug	---	---	-6 (-0.4)	-6 (-0.4)	-6 (-0.4)	-6 (-0.4)	-1 (-0.1)	8 (0.6)
Sep	---	---	-8 (-2.2)	-8 (-2.2)	-4 (-1.1)	-6 (-1.7)	-5 (-1.4)	-2 (-0.6)
Oct	---	---	-2 (-0.6)	-2 (-0.6)	-3 (-0.9)	-2 (-0.6)	-3 (-0.9)	2 (0.6)
Nov	---	---	3 (0.7)	3 (0.7)	-2 (-0.5)	3 (0.7)	1 (0.2)	4 (1.0)
Dec	---	---	-6 (-1.1)	-6 (-1.1)	-2 (-0.4)	-6 (-1.1)	-1 (-0.2)	-5 (-0.9)
Average	---	---	-1 (-0.1)	-1 (-0.1)	-4 (-0.5)	-1 (-0.1)	0 (0.0)	4 (0.5)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	9 (14.3)	8 (12.7)	8 (12.7)	7 (11.1)	8 (12.7)	8 (12.7)	9 (14.3)
Feb	---	8 (3.0)	6 (2.3)	6 (2.3)	6 (2.3)	6 (2.3)	6 (2.3)	7 (2.6)
Mar	---	16 (5.1)	12 (3.8)	14 (4.5)	14 (4.5)	12 (3.8)	12 (3.8)	10 (3.2)
Apr	---	23 (6.1)	17 (4.5)	19 (5.1)	20 (5.3)	17 (4.5)	19 (5.1)	20 (5.3)
May	---	19 (2.4)	27 (3.5)	27 (3.5)	14 (1.8)	27 (3.5)	28 (3.6)	33 (4.2)
Jun	---	7 (0.2)	22 (0.7)	22 (0.7)	1 (0.0)	22 (0.7)	22 (0.7)	28 (0.9)
Jul	---	12 (1.9)	17 (2.8)	13 (2.1)	5 (0.8)	13 (2.1)	15 (2.4)	31 (5.0)
Aug	---	11 (0.8)	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	10 (0.7)	19 (1.4)
Sep	---	29 (8.8)	21 (6.4)	21 (6.4)	25 (7.6)	23 (7.0)	24 (7.3)	27 (8.2)
Oct	---	17 (5.2)	15 (4.6)	15 (4.6)	14 (4.3)	15 (4.6)	14 (4.3)	19 (5.8)
Nov	---	-1 (-0.2)	2 (0.5)	2 (0.5)	-3 (-0.7)	2 (0.5)	0 (0.0)	3 (0.7)
Dec	---	12 (2.2)	6 (1.1)	6 (1.1)	10 (1.8)	6 (1.1)	11 (2.0)	7 (1.3)
Average	---	14 (1.9)	13 (1.8)	13 (1.8)	10 (1.4)	13 (1.8)	14 (1.9)	18 (2.5)

Table 107. Monthly Streamflow Dry Year (2004) – Arkansas River near Rocky Ford (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	53	53	51	51	51	51	51	53
Feb	59	132	165	168	155	166	127	137
Mar	143	234	234	235	233	235	232	234
Apr	465	470	467	467	468	468	468	469
May	760	818	810	810	811	810	803	807
Jun	907	942	938	939	938	938	938	943
Jul	716	739	735	736	739	739	746	744
Aug	392	439	439	440	438	437	425	429
Sep	125	132	128	128	129	128	130	132
Oct	147	159	165	164	159	164	165	167
Nov	223	225	225	225	223	225	225	227
Dec	112	114	113	113	112	113	113	115
Average	343	373	373	374	372	374	370	373
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	0 (0.0)
Feb	---	---	33 (25.0)	36 (27.3)	23 (17.4)	34 (25.8)	-5 (-3.8)	5 (3.8)
Mar	---	---	0 (0.0)	1 (0.4)	-1 (-0.4)	1 (0.4)	-2 (-0.9)	0 (0.0)
Apr	---	---	-3 (-0.6)	-3 (-0.6)	-2 (-0.4)	-2 (-0.4)	-2 (-0.4)	-1 (-0.2)
May	---	---	-8 (-1.0)	-8 (-1.0)	-7 (-0.9)	-8 (-1.0)	-15 (-1.8)	-11 (-1.3)
Jun	---	---	-4 (-0.4)	-3 (-0.3)	-4 (-0.4)	-4 (-0.4)	-4 (-0.4)	1 (0.1)
Jul	---	---	-4 (-0.5)	-3 (-0.4)	0 (0.0)	0 (0.0)	7 (0.9)	5 (0.7)
Aug	---	---	0 (0.0)	1 (0.2)	-1 (-0.2)	-2 (-0.5)	-14 (-3.2)	-10 (-2.3)
Sep	---	---	-4 (-3.0)	-4 (-3.0)	-3 (-2.3)	-4 (-3.0)	-2 (-1.5)	0 (0.0)
Oct	---	---	6 (3.8)	5 (3.1)	0 (0.0)	5 (3.1)	6 (3.8)	8 (5.0)
Nov	---	---	0 (0.0)	0 (0.0)	-2 (-0.9)	0 (0.0)	0 (0.0)	2 (0.9)
Dec	---	---	-1 (-0.9)	-1 (-0.9)	-2 (-1.8)	-1 (-0.9)	-1 (-0.9)	1 (0.9)
Average	---	---	0 (0.0)	1 (0.3)	-1 (-0.3)	1 (0.3)	-3 (-0.8)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	-2 (-3.8)	0 (0.0)
Feb	---	73 (123.7)	106 (179.7)	109 (184.7)	96 (162.7)	107 (181.4)	68 (115.3)	78 (132.2)
Mar	---	91 (63.6)	91 (63.6)	92 (64.3)	90 (62.9)	92 (64.3)	89 (62.2)	91 (63.6)
Apr	---	5 (1.1)	2 (0.4)	2 (0.4)	3 (0.6)	3 (0.6)	3 (0.6)	4 (0.9)
May	---	58 (7.6)	50 (6.6)	50 (6.6)	51 (6.7)	50 (6.6)	43 (5.7)	47 (6.2)
Jun	---	35 (3.9)	31 (3.4)	32 (3.5)	31 (3.4)	31 (3.4)	31 (3.4)	36 (4.0)
Jul	---	23 (3.2)	19 (2.7)	20 (2.8)	23 (3.2)	23 (3.2)	30 (4.2)	28 (3.9)
Aug	---	47 (12.0)	47 (12.0)	48 (12.2)	46 (11.7)	45 (11.5)	33 (8.4)	37 (9.4)
Sep	---	7 (5.6)	3 (2.4)	3 (2.4)	4 (3.2)	3 (2.4)	5 (4.0)	7 (5.6)
Oct	---	12 (8.2)	18 (12.2)	17 (11.6)	12 (8.2)	17 (11.6)	18 (12.2)	20 (13.6)
Nov	---	2 (0.9)	2 (0.9)	2 (0.9)	0 (0.0)	2 (0.9)	2 (0.9)	4 (1.8)
Dec	---	2 (1.8)	1 (0.9)	1 (0.9)	0 (0.0)	1 (0.9)	1 (0.9)	3 (2.7)
Average	---	30 (8.7)	30 (8.7)	31 (9.0)	29 (8.5)	31 (9.0)	27 (7.9)	30 (8.7)

Arkansas River at Las Animas Gage

The Arkansas River at Las Animas gage is the most downstream node in the Arkansas River Basin. Demand nodes were constructed in the Daily Model to meet downstream demands in the Arkansas Basin, including flows used to meet Arkansas River Compact requirements. The link into this node is set as the highest priority in the system meaning that demands must be met at the expense of all other demands in the basin. There is also a demand node that allows flows that are not diverted by other water rights in the basin to flow past the Las Animas gage into John Martin Reservoir and a node that accounts for the rule 10 and seep ditch demand for Super Ditch water.

The demand nodes are constructed to ensure that the Daily Model does not alter operations downstream of the Las Animas gage except during times when the historical call was junior to John Martin Reservoir or when there is excess flow in the river. Overall effects during most months are negligible compared to the No Action. During some months, there are minor effects on streamflow that occur due to changes in filling and spilling of Pueblo Reservoir during wet conditions.

Monthly simulated direct effects streamflow analysis at the Las Animas gage is shown in Table 108 through Table 111. Overall differences among the alternatives would be relatively minor.

Table 108. Overall Average Monthly Streamflow – Arkansas River at Las Animas (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	195	193	194	194	194	194	194	194
Feb	219	219	220	220	221	220	219	219
Mar	146	165	164	164	160	164	166	163
Apr	177	178	192	192	176	192	191	197
May	596	603	605	604	602	605	605	607
Jun	897	893	891	891	893	891	892	900
Jul	531	539	539	532	513	540	542	543
Aug	328	334	336	337	337	336	336	339
Sep	134	137	137	137	138	138	137	137
Oct	173	174	174	174	174	175	175	173
Nov	172	172	173	173	173	172	173	173
Dec	162	162	162	162	163	162	162	162
Average	311	314	316	315	312	316	316	318
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)
Feb	---	---	1 (0.5)	1 (0.5)	2 (0.9)	1 (0.5)	0 (0.0)	0 (0.0)
Mar	---	---	-1 (-0.6)	-1 (-0.6)	-5 (-3.0)	-1 (-0.6)	1 (0.6)	-2 (-1.2)
Apr	---	---	14 (7.9)	14 (7.9)	-2 (-1.1)	14 (7.9)	13 (7.3)	19 (10.7)
May	---	---	2 (0.3)	1 (0.2)	-1 (-0.2)	2 (0.3)	2 (0.3)	4 (0.7)
Jun	---	---	-2 (-0.2)	-2 (-0.2)	0 (0.0)	-2 (-0.2)	-1 (-0.1)	7 (0.8)
Jul	---	---	0 (0.0)	-7 (-1.3)	-26 (-4.8)	1 (0.2)	3 (0.6)	4 (0.7)
Aug	---	---	2 (0.6)	3 (0.9)	3 (0.9)	2 (0.6)	2 (0.6)	5 (1.5)
Sep	---	---	0 (0.0)	0 (0.0)	1 (0.7)	1 (0.7)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	1 (0.6)	-1 (-0.6)
Nov	---	---	1 (0.6)	1 (0.6)	1 (0.6)	0 (0.0)	1 (0.6)	1 (0.6)
Dec	---	---	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	2 (0.6)	1 (0.3)	-2 (-0.6)	2 (0.6)	2 (0.6)	4 (1.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-2 (-1.0)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)	-1 (-0.5)
Feb	---	0 (0.0)	1 (0.5)	1 (0.5)	2 (0.9)	1 (0.5)	0 (0.0)	0 (0.0)
Mar	---	19 (13.0)	18 (12.3)	18 (12.3)	14 (9.6)	18 (12.3)	20 (13.7)	17 (11.6)
Apr	---	1 (0.6)	15 (8.5)	15 (8.5)	-1 (-0.6)	15 (8.5)	14 (7.9)	20 (11.3)
May	---	7 (1.2)	9 (1.5)	8 (1.3)	6 (1.0)	9 (1.5)	9 (1.5)	11 (1.8)
Jun	---	-4 (-0.4)	-6 (-0.7)	-6 (-0.7)	-4 (-0.4)	-6 (-0.7)	-5 (-0.6)	3 (0.3)
Jul	---	8 (1.5)	8 (1.5)	1 (0.2)	-18 (-3.4)	9 (1.7)	11 (2.1)	12 (2.3)
Aug	---	6 (1.8)	8 (2.4)	9 (2.7)	9 (2.7)	8 (2.4)	8 (2.4)	11 (3.4)
Sep	---	3 (2.2)	3 (2.2)	3 (2.2)	4 (3.0)	4 (3.0)	3 (2.2)	3 (2.2)
Oct	---	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	2 (1.2)	2 (1.2)	0 (0.0)
Nov	---	0 (0.0)	1 (0.6)	1 (0.6)	1 (0.6)	0 (0.0)	1 (0.6)	1 (0.6)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	4 (1.3)	5 (1.6)	4 (1.3)	1 (0.3)	5 (1.6)	5 (1.6)	7 (2.3)

Table 109. Monthly Streamflow Normal Year (2005) – Arkansas River at Las Animas (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	189	177	177	177	177	177	177	177
Feb	279	268	265	271	270	265	271	265
Mar	112	109	115	115	111	114	113	113
Apr	24	29	29	29	29	29	29	29
May	202	216	220	219	216	220	216	221
Jun	298	303	303	303	303	303	303	303
Jul	215	220	220	220	220	220	220	220
Aug	158	164	165	165	165	165	165	164
Sep	37	41	41	41	41	41	41	40
Oct	72	72	73	73	72	73	73	72
Nov	80	80	81	81	80	81	81	81
Dec	89	86	86	87	86	86	86	86
Average	146	146	147	148	147	147	147	147
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	-3 (-1.1)	3 (1.1)	2 (0.7)	-3 (-1.1)	3 (1.1)	-3 (-1.1)
Mar	---	---	6 (5.5)	6 (5.5)	2 (1.8)	5 (4.6)	4 (3.7)	4 (3.7)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	4 (1.9)	3 (1.4)	0 (0.0)	4 (1.9)	0 (0.0)	5 (2.3)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-2.4)
Oct	---	---	1 (1.4)	1 (1.4)	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)
Nov	---	---	1 (1.3)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.3)	1 (1.3)
Dec	---	---	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (0.7)	2 (1.4)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)
Feb	---	-11 (-3.9)	-14 (-5.0)	-8 (-2.9)	-9 (-3.2)	-14 (-5.0)	-8 (-2.9)	-14 (-5.0)
Mar	---	-3 (-2.7)	3 (2.7)	3 (2.7)	-1 (-0.9)	2 (1.8)	1 (0.9)	1 (0.9)
Apr	---	5 (20.8)	5 (20.8)	5 (20.8)	5 (20.8)	5 (20.8)	5 (20.8)	5 (20.8)
May	---	14 (6.9)	18 (8.9)	17 (8.4)	14 (6.9)	18 (8.9)	14 (6.9)	19 (9.4)
Jun	---	5 (1.7)	5 (1.7)	5 (1.7)	5 (1.7)	5 (1.7)	5 (1.7)	5 (1.7)
Jul	---	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)
Aug	---	6 (3.8)	7 (4.4)	7 (4.4)	7 (4.4)	7 (4.4)	7 (4.4)	6 (3.8)
Sep	---	4 (10.8)	4 (10.8)	4 (10.8)	4 (10.8)	4 (10.8)	4 (10.8)	3 (8.1)
Oct	---	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)
Nov	---	0 (0.0)	1 (1.3)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.3)	1 (1.3)
Dec	---	-3 (-3.4)	-3 (-3.4)	-2 (-2.2)	-3 (-3.4)	-3 (-3.4)	-3 (-3.4)	-3 (-3.4)
Average	---	0 (0.0)	1 (0.7)	2 (1.4)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)

Table 110. Monthly Streamflow Wet Year (1997) – Arkansas River at Las Animas (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	166	166	166	166	166	166	166	166
Feb	370	370	370	370	370	370	370	370
Mar	232	245	250	250	245	249	249	246
Apr	74	79	79	79	79	79	79	79
May	217	223	223	223	223	223	223	223
Jun	2,682	2,688	2,688	2,688	2,688	2,688	2,688	2,688
Jul	154	159	159	159	159	159	159	159
Aug	1,274	1,279	1,279	1,279	1,279	1,279	1,279	1,279
Sep	114	117	117	117	117	117	117	117
Oct	381	382	382	382	383	382	382	382
Nov	811	811	811	811	811	811	810	810
Dec	349	351	354	354	352	354	353	353
Average	566	570	571	571	570	571	571	570
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	5 (2.0)	5 (2.0)	0 (0.0)	4 (1.6)	4 (1.6)	1 (0.4)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	-1 (-0.1)
Dec	---	---	3 (0.9)	3 (0.9)	1 (0.3)	3 (0.9)	2 (0.6)	2 (0.6)
Average	---	---	1 (0.2)	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.2)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	13 (5.6)	18 (7.8)	18 (7.8)	13 (5.6)	17 (7.3)	17 (7.3)	14 (6.0)
Apr	---	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)
May	---	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)
Jun	---	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)
Jul	---	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)
Aug	---	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)
Sep	---	3 (2.6)	3 (2.6)	3 (2.6)	3 (2.6)	3 (2.6)	3 (2.6)	3 (2.6)
Oct	---	1 (0.3)	1 (0.3)	1 (0.3)	2 (0.5)	1 (0.3)	1 (0.3)	1 (0.3)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	-1 (-0.1)
Dec	---	2 (0.6)	5 (1.4)	5 (1.4)	3 (0.9)	5 (1.4)	4 (1.1)	4 (1.1)
Average	---	4 (0.7)	5 (0.9)	5 (0.9)	4 (0.7)	5 (0.9)	5 (0.9)	4 (0.7)

Table 111. Monthly Streamflow Dry Year (2004) – Arkansas River at Las Animas (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	72	72	72	72	73	72	72	72
Feb	76	76	76	76	76	76	76	76
Mar	40	46	68	70	59	67	62	62
Apr	91	112	107	105	109	110	113	113
May	272	278	278	278	278	278	278	278
Jun	447	452	453	453	453	453	453	452
Jul	301	307	308	308	309	308	308	307
Aug	348	355	356	356	357	354	356	355
Sep	46	47	49	49	50	50	48	47
Oct	36	37	41	40	39	41	37	35
Nov	151	151	151	151	151	151	151	151
Dec	158	158	158	158	158	158	158	158
Average	170	175	177	177	177	177	177	176
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	22 (47.8)	24 (52.2)	13 (28.3)	21 (45.7)	16 (34.8)	16 (34.8)
Apr	---	---	-5 (-4.5)	-7 (-6.3)	-3 (-2.7)	-2 (-1.8)	1 (0.9)	1 (0.9)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	0 (0.0)
Jul	---	---	1 (0.3)	1 (0.3)	2 (0.7)	1 (0.3)	1 (0.3)	0 (0.0)
Aug	---	---	1 (0.3)	1 (0.3)	2 (0.6)	-1 (-0.3)	1 (0.3)	0 (0.0)
Sep	---	---	2 (4.3)	2 (4.3)	3 (6.4)	3 (6.4)	1 (2.1)	0 (0.0)
Oct	---	---	4 (10.8)	3 (8.1)	2 (5.4)	4 (10.8)	0 (0.0)	-2 (-5.4)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	2 (1.1)	2 (1.1)	2 (1.1)	2 (1.1)	2 (1.1)	1 (0.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	6 (15.0)	28 (70.0)	30 (75.0)	19 (47.5)	27 (67.5)	22 (55.0)	22 (55.0)
Apr	---	21 (23.1)	16 (17.6)	14 (15.4)	18 (19.8)	19 (20.9)	22 (24.2)	22 (24.2)
May	---	6 (2.2)	6 (2.2)	6 (2.2)	6 (2.2)	6 (2.2)	6 (2.2)	6 (2.2)
Jun	---	5 (1.1)	6 (1.3)	6 (1.3)	6 (1.3)	6 (1.3)	6 (1.3)	5 (1.1)
Jul	---	6 (2.0)	7 (2.3)	7 (2.3)	8 (2.7)	7 (2.3)	7 (2.3)	6 (2.0)
Aug	---	7 (2.0)	8 (2.3)	8 (2.3)	9 (2.6)	6 (1.7)	8 (2.3)	7 (2.0)
Sep	---	1 (2.2)	3 (6.5)	3 (6.5)	4 (8.7)	4 (8.7)	2 (4.3)	1 (2.2)
Oct	---	1 (2.8)	5 (13.9)	4 (11.1)	3 (8.3)	5 (13.9)	1 (2.8)	-1 (-2.8)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	5 (2.9)	7 (4.1)	7 (4.1)	7 (4.1)	7 (4.1)	7 (4.1)	6 (3.5)

A summary of historical and simulated annual direct effects analysis streamflow at the Las Animas gage is presented in Table 112. Simulated streamflow exceeds historical streamflow during all years in the study period. The following years have days when the historical call was junior to the John Martin Reservoir:

- 1985
- 1995
- 1998
- 1999

Table 112. Historical and Simulated Annual Streamflow - Arkansas River at Las Animas (Direct Effects).

	Historical (ac-ft)	Existing Conditions (ac-ft)	No Action (ac-ft)	Comanche – South (ac-ft)	Pueblo Dam – South (ac-ft)	JUP – North (ac-ft)	Pueblo Dam – North (ac-ft)	River South (ac-ft)	Master Contract Only (ac-ft)
1982	185,220	189,370	193,150	194,140	194,180	193,570	194,140	194,050	194,080
1983	283,720	306,600	290,770	291,530	291,510	290,520	291,410	291,910	302,040
1984	425,950	456,240	464,810	460,500	461,330	452,370	461,550	465,010	463,920
*1985	352,940	366,080	369,930	371,680	371,520	366,730	371,880	373,530	373,590
1986	185,150	211,030	218,740	222,930	222,350	217,310	222,920	223,130	223,380
1987	457,820	467,200	472,360	470,540	470,360	469,930	471,000	469,360	474,400
1988	79,800	104,300	107,020	109,400	109,890	105,840	109,240	109,840	110,310
1989	94,170	96,410	99,060	99,340	99,360	99,260	99,320	99,260	99,060
1990	147,080	150,960	153,710	153,650	153,980	154,920	153,620	153,660	153,810
1991	133,530	136,650	139,690	140,130	140,240	140,580	140,260	140,000	139,740
1992	151,960	153,400	155,560	156,030	155,950	155,640	156,030	155,940	155,660
1993	179,560	184,060	185,350	187,690	187,620	185,600	187,680	187,250	186,490
1994	216,410	221,350	224,310	225,010	225,020	225,090	224,980	224,520	224,590
*1995	592,610	638,750	632,900	636,730	626,590	606,030	636,660	639,090	647,290
1996	157,620	168,730	174,670	180,420	180,600	173,060	180,530	180,790	181,840
1997	412,620	410,070	412,790	413,330	413,320	412,970	413,310	413,140	412,970
*1998	213,190	216,360	220,180	220,910	220,950	218,120	220,660	221,210	222,260
*1999	540,270	562,690	567,880	570,470	568,770	563,750	570,730	571,320	576,280
2000	86,530	86,710	88,860	89,440	89,440	88,880	89,530	89,240	90,320
2001	120,180	122,280	125,720	125,110	125,200	127,250	125,070	125,270	125,020
2002	32,140	43,210	47,520	50,640	49,800	48,310	50,620	50,050	49,340
2003	73,230	80,020	82,940	82,260	82,300	82,850	82,270	82,910	82,050
2004	120,020	123,770	126,990	128,550	128,490	128,220	128,660	128,280	127,930
2005	92,360	105,460	106,050	106,620	107,010	106,380	106,670	106,670	106,440
2006	157,320	158,750	161,380	162,180	162,180	161,510	162,170	161,970	161,870
2007	203,970	204,760	207,190	207,940	207,930	207,320	207,940	207,800	207,450
2008	197,410	198,660	201,420	201,370	201,380	201,820	201,380	201,420	200,960
2009	134,120	137,160	139,870	140,730	140,740	140,260	140,730	140,450	140,330
Average	200,780	209,790	212,250	213,230	212,900	210,940	213,310	213,470	214,210

Notes:
(1) * Years with historical calls junior to John Martin Reservoir.

Mean monthly simulated streamflow for the cumulative effects analysis is presented in Table 113 through Table 116. There is little difference between alternatives. The same increase in streamflow during February that was seen at the Rocky Ford gage for Cumulative Effects is seen at the Las Animas gage. Again, this is due to the timing of diversions into Colorado Canal during February of 2004 and 2005.

Table 113. Overall Average Monthly Streamflow – Arkansas River at Las Animas (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	195	195	195	195	195	195	195	195
Feb	219	227	232	232	232	232	225	227
Mar	146	165	168	167	165	167	167	167
Apr	177	146	147	146	143	146	143	147
May	596	594	591	591	588	591	591	596
Jun	897	852	857	857	851	857	857	855
Jul	531	484	484	483	485	483	485	491
Aug	328	335	338	337	334	338	335	334
Sep	134	143	144	145	144	144	144	143
Oct	173	176	178	178	176	177	179	176
Nov	172	173	173	173	175	173	173	173
Dec	162	162	162	162	162	162	162	162
Average	311	305	306	306	304	306	305	306
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	5 (2.2)	5 (2.2)	5 (2.2)	5 (2.2)	-2 (-0.9)	0 (0.0)
Mar	---	---	3 (1.8)	2 (1.2)	0 (0.0)	2 (1.2)	2 (1.2)	2 (1.2)
Apr	---	---	1 (0.7)	0 (0.0)	-3 (-2.1)	0 (0.0)	-3 (-2.1)	1 (0.7)
May	---	---	-3 (-0.5)	-3 (-0.5)	-6 (-1.0)	-3 (-0.5)	-3 (-0.5)	2 (0.3)
Jun	---	---	5 (0.6)	5 (0.6)	-1 (-0.1)	5 (0.6)	5 (0.6)	3 (0.4)
Jul	---	---	0 (0.0)	-1 (-0.2)	1 (0.2)	-1 (-0.2)	1 (0.2)	7 (1.4)
Aug	---	---	3 (0.9)	2 (0.6)	-1 (-0.3)	3 (0.9)	0 (0.0)	-1 (-0.3)
Sep	---	---	1 (0.7)	2 (1.4)	1 (0.7)	1 (0.7)	1 (0.7)	0 (0.0)
Oct	---	---	2 (1.1)	2 (1.1)	0 (0.0)	1 (0.6)	3 (1.7)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	2 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (0.3)	1 (0.3)	-1 (-0.3)	1 (0.3)	0 (0.0)	1 (0.3)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	8 (3.7)	13 (5.9)	13 (5.9)	13 (5.9)	13 (5.9)	6 (2.7)	8 (3.7)
Mar	---	19 (13.0)	22 (15.1)	21 (14.4)	19 (13.0)	21 (14.4)	21 (14.4)	21 (14.4)
Apr	---	-31 (-17.5)	-30 (-16.9)	-31 (-17.5)	-34 (-19.2)	-31 (-17.5)	-34 (-19.2)	-30 (-16.9)
May	---	-2 (-0.3)	-5 (-0.8)	-5 (-0.8)	-8 (-1.3)	-5 (-0.8)	-5 (-0.8)	0 (0.0)
Jun	---	-45 (-5.0)	-40 (-4.5)	-40 (-4.5)	-46 (-5.1)	-40 (-4.5)	-40 (-4.5)	-42 (-4.7)
Jul	---	-47 (-8.9)	-47 (-8.9)	-48 (-9.0)	-46 (-8.7)	-48 (-9.0)	-46 (-8.7)	-40 (-7.5)
Aug	---	7 (2.1)	10 (3.0)	9 (2.7)	6 (1.8)	10 (3.0)	7 (2.1)	6 (1.8)
Sep	---	9 (6.7)	10 (7.5)	11 (8.2)	10 (7.5)	10 (7.5)	10 (7.5)	9 (6.7)
Oct	---	3 (1.7)	5 (2.9)	5 (2.9)	3 (1.7)	4 (2.3)	6 (3.5)	3 (1.7)
Nov	---	1 (0.6)	1 (0.6)	1 (0.6)	3 (1.7)	1 (0.6)	1 (0.6)	1 (0.6)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-6 (-1.9)	-5 (-1.6)	-5 (-1.6)	-6 (-1.9)	-5 (-1.6)	-6 (-1.9)	-5 (-1.6)

Table 114. Monthly Streamflow Normal Year (2005) – Arkansas River at Las Animas (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	189	177	177	177	177	177	177	177
Feb	279	154	187	186	187	187	143	151
Mar	112	153	162	159	153	159	158	162
Apr	24	30	30	30	30	30	30	30
May	202	215	215	215	216	215	222	216
Jun	298	304	304	304	304	304	304	304
Jul	215	220	220	220	220	220	220	220
Aug	158	164	164	164	164	164	164	164
Sep	37	47	47	46	46	46	46	45
Oct	72	75	74	74	72	74	76	74
Nov	80	81	81	81	81	81	81	81
Dec	89	89	89	89	89	89	89	89
Average	146	143	146	145	145	145	143	143
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	33 (21.4)	32 (20.8)	33 (21.4)	33 (21.4)	-11 (-7.1)	-3 (-1.9)
Mar	---	---	9 (5.9)	6 (3.9)	0 (0.0)	6 (3.9)	5 (3.3)	9 (5.9)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	7 (3.3)	1 (0.5)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	-1 (-2.1)	-1 (-2.1)	-1 (-2.1)	-1 (-2.1)	-2 (-4.3)
Oct	---	---	-1 (-1.3)	-1 (-1.3)	-3 (-4.0)	-1 (-1.3)	1 (1.3)	-1 (-1.3)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	3 (2.1)	2 (1.4)	2 (1.4)	2 (1.4)	0 (0.0)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)	-12 (-6.3)
Feb	---	-125 (-44.8)	-92 (-33.0)	-93 (-33.3)	-92 (-33.0)	-92 (-33.0)	-136 (-48.7)	-128 (-45.9)
Mar	---	41 (36.6)	50 (44.6)	47 (42.0)	41 (36.6)	47 (42.0)	46 (41.1)	50 (44.6)
Apr	---	6 (25.0)	6 (25.0)	6 (25.0)	6 (25.0)	6 (25.0)	6 (25.0)	6 (25.0)
May	---	13 (6.4)	13 (6.4)	13 (6.4)	14 (6.9)	13 (6.4)	20 (9.9)	14 (6.9)
Jun	---	6 (2.0)	6 (2.0)	6 (2.0)	6 (2.0)	6 (2.0)	6 (2.0)	6 (2.0)
Jul	---	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)	5 (2.3)
Aug	---	6 (3.8)	6 (3.8)	6 (3.8)	6 (3.8)	6 (3.8)	6 (3.8)	6 (3.8)
Sep	---	10 (27.0)	10 (27.0)	9 (24.3)	9 (24.3)	9 (24.3)	9 (24.3)	8 (21.6)
Oct	---	3 (4.2)	2 (2.8)	2 (2.8)	0 (0.0)	2 (2.8)	4 (5.6)	2 (2.8)
Nov	---	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-3 (-2.1)	0 (0.0)	-1 (-0.7)	-1 (-0.7)	-1 (-0.7)	-3 (-2.1)	-3 (-2.1)

Table 115. Monthly Streamflow Wet Year (1997) – Arkansas River at Las Animas (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	166	166	166	166	166	166	166	166
Feb	370	370	370	370	370	370	370	370
Mar	232	242	247	242	242	243	242	252
Apr	74	79	79	79	79	79	79	79
May	217	223	223	223	223	223	223	223
Jun	2,682	2,688	2,688	2,688	2,688	2,688	2,688	2,688
Jul	154	159	159	159	159	159	159	159
Aug	1,274	1,279	1,279	1,279	1,279	1,279	1,284	1,279
Sep	114	121	121	121	122	121	122	121
Oct	381	398	393	393	397	393	395	394
Nov	811	810	810	810	810	810	810	810
Dec	349	347	348	348	348	348	348	348
Average	566	571	571	571	571	571	572	572
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	5 (2.1)	0 (0.0)	0 (0.0)	1 (0.4)	0 (0.0)	10 (4.1)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (0.4)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.8)	0 (0.0)
Oct	---	---	-5 (-1.3)	-5 (-1.3)	-1 (-0.3)	-5 (-1.3)	-3 (-0.8)	-4 (-1.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)	1 (0.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	10 (4.3)	15 (6.5)	10 (4.3)	10 (4.3)	11 (4.7)	10 (4.3)	20 (8.6)
Apr	---	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)	5 (6.8)
May	---	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)	6 (2.8)
Jun	---	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)	6 (0.2)
Jul	---	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)	5 (3.2)
Aug	---	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	10 (0.8)	5 (0.4)
Sep	---	7 (6.1)	7 (6.1)	7 (6.1)	8 (7.0)	7 (6.1)	8 (7.0)	7 (6.1)
Oct	---	17 (4.5)	12 (3.1)	12 (3.1)	16 (4.2)	12 (3.1)	14 (3.7)	13 (3.4)
Nov	---	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
Dec	---	-2 (-0.6)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Average	---	5 (0.9)	5 (0.9)	5 (0.9)	5 (0.9)	5 (0.9)	6 (1.1)	6 (1.1)

Table 116. Monthly Streamflow Dry Year (2004) – Arkansas River at Las Animas (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	72	76	77	77	77	77	77	76
Feb	76	146	179	182	170	179	143	151
Mar	40	128	137	138	129	138	135	127
Apr	91	93	93	94	95	94	95	96
May	272	331	328	329	329	328	322	328
Jun	447	469	471	471	471	471	471	471
Jul	301	318	319	320	323	323	329	322
Aug	348	387	392	393	393	390	378	376
Sep	46	51	51	51	52	51	52	50
Oct	36	35	36	36	37	36	36	35
Nov	151	151	151	151	151	151	151	151
Dec	158	158	158	158	158	158	158	158
Average	170	196	200	200	199	200	196	196
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	1 (1.3)	0 (0.0)
Feb	---	---	33 (22.6)	36 (24.7)	24 (16.4)	33 (22.6)	-3 (-2.1)	5 (3.4)
Mar	---	---	9 (7.0)	10 (7.8)	1 (0.8)	10 (7.8)	7 (5.5)	-1 (-0.8)
Apr	---	---	0 (0.0)	1 (1.1)	2 (2.2)	1 (1.1)	2 (2.2)	3 (3.2)
May	---	---	-3 (-0.9)	-2 (-0.6)	-2 (-0.6)	-3 (-0.9)	-9 (-2.7)	-3 (-0.9)
Jun	---	---	2 (0.4)	2 (0.4)	2 (0.4)	2 (0.4)	2 (0.4)	2 (0.4)
Jul	---	---	1 (0.3)	2 (0.6)	5 (1.6)	5 (1.6)	11 (3.5)	4 (1.3)
Aug	---	---	5 (1.3)	6 (1.6)	6 (1.6)	3 (0.8)	-9 (-2.3)	-11 (-2.8)
Sep	---	---	0 (0.0)	0 (0.0)	1 (2.0)	0 (0.0)	1 (2.0)	-1 (-2.0)
Oct	---	---	1 (2.9)	1 (2.9)	2 (5.7)	1 (2.9)	1 (2.9)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	4 (2.0)	4 (2.0)	3 (1.5)	4 (2.0)	0 (0.0)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	4 (5.6)	5 (6.9)	5 (6.9)	5 (6.9)	5 (6.9)	5 (6.9)	4 (5.6)
Feb	---	70 (92.1)	103 (135.5)	106 (139.5)	94 (123.7)	103 (135.5)	67 (88.2)	75 (98.7)
Mar	---	88 (220.0)	97 (242.5)	98 (245.0)	89 (222.5)	98 (245.0)	95 (237.5)	87 (217.5)
Apr	---	2 (2.2)	2 (2.2)	3 (3.3)	4 (4.4)	3 (3.3)	4 (4.4)	5 (5.5)
May	---	59 (21.7)	56 (20.6)	57 (21.0)	57 (21.0)	56 (20.6)	50 (18.4)	56 (20.6)
Jun	---	22 (4.9)	24 (5.4)	24 (5.4)	24 (5.4)	24 (5.4)	24 (5.4)	24 (5.4)
Jul	---	17 (5.6)	18 (6.0)	19 (6.3)	22 (7.3)	22 (7.3)	28 (9.3)	21 (7.0)
Aug	---	39 (11.2)	44 (12.6)	45 (12.9)	45 (12.9)	42 (12.1)	30 (8.6)	28 (8.0)
Sep	---	5 (10.9)	5 (10.9)	5 (10.9)	6 (13.0)	5 (10.9)	6 (13.0)	4 (8.7)
Oct	---	-1 (-2.8)	0 (0.0)	0 (0.0)	1 (2.8)	0 (0.0)	0 (0.0)	-1 (-2.8)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	26 (15.3)	30 (17.6)	30 (17.6)	29 (17.1)	30 (17.6)	26 (15.3)	26 (15.3)

Fountain Creek Basin

The Fountain Creek Basin includes gages on Fountain Creek from the 33rd Street gage to its confluence with the Arkansas River, Monument Creek from Palmer Lake to its confluence with Fountain Creek, Jimmy Camp Creek, and Williams Creek. A summary of the average annual simulated streamflow for the direct effects analysis at several of the gages in the Fountain Creek Basin is presented in Table 117 while annual simulated streamflow for the cumulative effects analysis is presented in Table 118.

As shown, all average annual effects are negligible except at the Fountain gage, where they are minor, for direct effects. Alternatives that simulate the full Master Contract space have slightly higher flows downstream of Fountain due to the Master Contract participants releasing supplies for exchange into Pueblo Reservoir. All average annual effects are negligible for the cumulative effects analysis.

Table 117. Mean Annual Streamflow – Fountain Creek Basin (Direct Effects).

Node Description	Existing Conditions (cfs)	No Action (cfs)	Comanche South (cfs)	Pueblo Dam South (cfs)	JUP North (cfs)	Pueblo Dam North (cfs)	River South (cfs)	Master Contract Only (cfs)
Simulated Streamflow (cfs)								
Fountain Creek Below Janitell Rd Below Colorado Springs	119	120	120	120	120	120	120	120
Fountain Creek At Security	145	146	147	147	147	147	147	147
Fountain Creek Near Fountain	165	172	175	175	172	175	175	175
Fountain Creek Near Piñon	154	160	164	164	160	164	164	163
Fountain Creek At Pueblo	164	170	173	173	170	173	173	173
Effects (cfs) (Alternative - No Action)								
Fountain Creek Below Janitell Rd Below Colorado Springs	---	---	0	0	0	0	0	0
Fountain Creek At Security	---	---	1	1	1	1	1	1
Fountain Creek Near Fountain	---	---	3	3	0	3	3	3
Fountain Creek Near Piñon	---	---	4	4	0	4	4	3
Fountain Creek At Pueblo	---	---	3	3	0	3	3	3
Effects (%) (Alternative - No Action / No Action)								
Fountain Creek Below Janitell Rd Below Colorado Springs	---	---	0.0	0.0	0.0	0.0	0.0	0.0
Fountain Creek At Security	---	---	0.7	0.7	0.7	0.7	0.7	0.7
Fountain Creek Near Fountain	---	---	1.7	1.7	0.0	1.7	1.7	1.7
Fountain Creek Near Piñon	---	---	2.5	2.5	0.0	2.5	2.5	1.9
Fountain Creek At Pueblo	---	---	1.8	1.8	0.0	1.8	1.8	1.8

Table 118. Mean Annual Streamflow – Fountain Creek Basin (Cumulative Effects).

Node Description	Existing Conditions (cfs)	No Action (cfs)	Comanche South (cfs)	Pueblo Dam South (cfs)	JUP North (cfs)	Pueblo Dam North (cfs)	River South (cfs)	Master Contract Only (cfs)
Simulated Streamflow (cfs)								
Fountain Creek Below Janitell Rd Below Colorado Springs	119	217	217	217	217	217	217	217
Fountain Creek At Security	145	245	245	245	245	245	245	245
Fountain Creek Near Fountain	165	276	277	277	276	277	278	278
Fountain Creek Near Piñon	154	262	263	263	262	263	263	263
Fountain Creek At Pueblo	164	270	271	271	270	271	271	271
Effects (cfs) (Alternative - No Action)								
Fountain Creek Below Janitell Rd Below Colorado Springs	---	---	0	0	0	0	0	0
Fountain Creek At Security	---	---	0	0	0	0	0	0
Fountain Creek Near Fountain	---	---	1	1	0	1	2	2
Fountain Creek Near Piñon	---	---	1	1	0	1	1	1
Fountain Creek At Pueblo	---	---	1	1	0	1	1	1
Effects (%) (Alternative - No Action / No Action)								
Fountain Creek Below Janitell Rd Below Colorado Springs	---	---	0.0	0.0	0.0	0.0	0.0	0.0
Fountain Creek At Security	---	---	0.0	0.0	0.0	0.0	0.0	0.0
Fountain Creek Near Fountain	---	---	0.4	0.4	0.0	0.4	0.7	0.7
Fountain Creek Near Piñon	---	---	0.4	0.4	0.0	0.4	0.4	0.4
Fountain Creek At Pueblo	---	---	0.4	0.4	0.0	0.4	0.4	0.4

Fountain Creek at Pueblo

The Fountain Creek at Pueblo gage is located within the city of Pueblo and essentially represents flows in Fountain Creek at its confluence with the Arkansas River. Streamflow at this gage includes the net effects of all operations for Master Contract that occur on Fountain Creek. In general, streamflow at the Fountain Creek at Pueblo gage would increase between action alternatives and the No Action. Reusable return flows would flow down Fountain Creek for subsequent exchange to Pueblo Reservoir or storage in ROY or the Colorado Canal system.

The overall average, normal year, typical wet year and typical dry year mean monthly streamflow for the direct effects analysis at the Fountain Creek at Pueblo gage are shown in Table 119 through Table 122. As described above, there are minor effects on streamflow, especially during dry years and winter low flow conditions. Master Contract participants release supplies for storage in Colorado Canal and subsequent exchange into Pueblo Reservoir, after the Winter Water season. The cumulative effects overall average, normal year, typical wet year and typical dry year mean monthly streamflow at the Fountain Creek at Pueblo gage are shown in Table 123 through Table 126. In general, the cumulative effects show fewer months with minor effects. During the wet year of 1997, the month of May shows higher flows for most alternatives during May due to releases by Master Contract participants for exchange into Pueblo Reservoir when flows are high.

Table 119. Overall Average Monthly Streamflow – Fountain Creek at Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	125	130	139	139	130	139	139	139
Feb	136	140	148	148	140	148	148	148
Mar	151	154	160	160	154	160	160	159
Apr	175	180	186	186	180	186	186	186
May	274	278	281	281	278	281	281	281
Jun	230	234	235	235	234	235	235	235
Jul	160	165	165	166	165	165	165	165
Aug	212	215	215	215	215	215	215	215
Sep	110	115	115	115	115	115	115	115
Oct	130	145	145	145	145	145	145	145
Nov	141	155	155	155	155	155	155	155
Dec	121	132	135	135	132	135	135	135
Average	164	170	173	173	170	173	173	173
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	9 (6.9)	9 (6.9)	0 (0.0)	9 (6.9)	9 (6.9)	9 (6.9)
Feb	---	---	8 (5.7)	8 (5.7)	0 (0.0)	8 (5.7)	8 (5.7)	8 (5.7)
Mar	---	---	6 (3.9)	6 (3.9)	0 (0.0)	6 (3.9)	6 (3.9)	5 (3.2)
Apr	---	---	6 (3.3)	6 (3.3)	0 (0.0)	6 (3.3)	6 (3.3)	6 (3.3)
May	---	---	3 (1.1)	3 (1.1)	0 (0.0)	3 (1.1)	3 (1.1)	3 (1.1)
Jun	---	---	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)
Jul	---	---	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	3 (2.3)	3 (2.3)	0 (0.0)	3 (2.3)	3 (2.3)	3 (2.3)
Average	---	---	3 (1.8)	3 (1.8)	0 (0.0)	3 (1.8)	3 (1.8)	3 (1.8)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	5 (4.0)	14 (11.2)	14 (11.2)	5 (4.0)	14 (11.2)	14 (11.2)	14 (11.2)
Feb	---	4 (2.9)	12 (8.8)	12 (8.8)	4 (2.9)	12 (8.8)	12 (8.8)	12 (8.8)
Mar	---	3 (2.0)	9 (6.0)	9 (6.0)	3 (2.0)	9 (6.0)	9 (6.0)	8 (5.3)
Apr	---	5 (2.9)	11 (6.3)	11 (6.3)	5 (2.9)	11 (6.3)	11 (6.3)	11 (6.3)
May	---	4 (1.5)	7 (2.6)	7 (2.6)	4 (1.5)	7 (2.6)	7 (2.6)	7 (2.6)
Jun	---	4 (1.7)	5 (2.2)	5 (2.2)	4 (1.7)	5 (2.2)	5 (2.2)	5 (2.2)
Jul	---	5 (3.1)	5 (3.1)	6 (3.8)	5 (3.1)	5 (3.1)	5 (3.1)	5 (3.1)
Aug	---	3 (1.4)	3 (1.4)	3 (1.4)	3 (1.4)	3 (1.4)	3 (1.4)	3 (1.4)
Sep	---	5 (4.5)	5 (4.5)	5 (4.5)	5 (4.5)	5 (4.5)	5 (4.5)	5 (4.5)
Oct	---	15 (11.5)	15 (11.5)	15 (11.5)	15 (11.5)	15 (11.5)	15 (11.5)	15 (11.5)
Nov	---	14 (9.9)	14 (9.9)	14 (9.9)	14 (9.9)	14 (9.9)	14 (9.9)	14 (9.9)
Dec	---	11 (9.1)	14 (11.6)	14 (11.6)	11 (9.1)	14 (11.6)	14 (11.6)	14 (11.6)
Average	---	6 (3.7)	10 (6.1)	10 (6.1)	7 (4.3)	10 (6.1)	10 (6.1)	9 (5.5)

Table 120. Monthly Streamflow Normal Year (2005) – Fountain Creek at Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	113	116	127	127	116	127	127	127
Feb	117	117	126	126	117	126	126	126
Mar	103	103	110	111	103	110	110	110
Apr	172	174	185	185	174	185	185	185
May	131	135	140	140	135	140	140	140
Jun	130	133	134	134	133	134	134	134
Jul	31	39	39	39	39	39	39	39
Aug	141	145	145	145	145	145	145	145
Sep	30	35	36	36	36	36	36	36
Oct	94	110	110	110	110	110	110	110
Nov	93	106	106	106	106	106	106	106
Dec	84	94	96	96	94	96	96	96
Average	103	109	113	113	109	113	113	113
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	11 (9.5)	11 (9.5)	0 (0.0)	11 (9.5)	11 (9.5)	11 (9.5)
Feb	---	---	9 (7.7)	9 (7.7)	0 (0.0)	9 (7.7)	9 (7.7)	9 (7.7)
Mar	---	---	7 (6.8)	8 (7.8)	0 (0.0)	7 (6.8)	7 (6.8)	7 (6.8)
Apr	---	---	11 (6.3)	11 (6.3)	0 (0.0)	11 (6.3)	11 (6.3)	11 (6.3)
May	---	---	5 (3.7)	5 (3.7)	0 (0.0)	5 (3.7)	5 (3.7)	5 (3.7)
Jun	---	---	1 (0.8)	1 (0.8)	0 (0.0)	1 (0.8)	1 (0.8)	1 (0.8)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	1 (2.9)	1 (2.9)	1 (2.9)	1 (2.9)	1 (2.9)	1 (2.9)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	2 (2.1)	2 (2.1)	0 (0.0)	2 (2.1)	2 (2.1)	2 (2.1)
Average	---	---	4 (3.7)	4 (3.7)	0 (0.0)	4 (3.7)	4 (3.7)	4 (3.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	3 (2.7)	14 (12.4)	14 (12.4)	3 (2.7)	14 (12.4)	14 (12.4)	14 (12.4)
Feb	---	0 (0.0)	9 (7.7)	9 (7.7)	0 (0.0)	9 (7.7)	9 (7.7)	9 (7.7)
Mar	---	0 (0.0)	7 (6.8)	8 (7.8)	0 (0.0)	7 (6.8)	7 (6.8)	7 (6.8)
Apr	---	2 (1.2)	13 (7.6)	13 (7.6)	2 (1.2)	13 (7.6)	13 (7.6)	13 (7.6)
May	---	4 (3.1)	9 (6.9)	9 (6.9)	4 (3.1)	9 (6.9)	9 (6.9)	9 (6.9)
Jun	---	3 (2.3)	4 (3.1)	4 (3.1)	3 (2.3)	4 (3.1)	4 (3.1)	4 (3.1)
Jul	---	8 (25.8)	8 (25.8)	8 (25.8)	8 (25.8)	8 (25.8)	8 (25.8)	8 (25.8)
Aug	---	4 (2.8)	4 (2.8)	4 (2.8)	4 (2.8)	4 (2.8)	4 (2.8)	4 (2.8)
Sep	---	5 (16.7)	6 (20.0)	6 (20.0)	6 (20.0)	6 (20.0)	6 (20.0)	6 (20.0)
Oct	---	16 (17.0)	16 (17.0)	16 (17.0)	16 (17.0)	16 (17.0)	16 (17.0)	16 (17.0)
Nov	---	13 (14.0)	13 (14.0)	13 (14.0)	13 (14.0)	13 (14.0)	13 (14.0)	13 (14.0)
Dec	---	10 (11.9)	12 (14.3)	12 (14.3)	10 (11.9)	12 (14.3)	12 (14.3)	12 (14.3)
Average	---	6 (5.8)	10 (9.7)	10 (9.7)	6 (5.8)	10 (9.7)	10 (9.7)	10 (9.7)

Table 121. Monthly Streamflow Wet Year (1997) – Fountain Creek at Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	109	116	125	125	116	125	125	125
Feb	139	143	149	149	143	149	150	149
Mar	141	143	147	147	143	147	147	147
Apr	214	226	229	229	226	229	229	229
May	272	279	280	280	279	280	280	280
Jun	1,100	1,096	1,097	1,097	1,096	1,097	1,097	1,097
Jul	167	175	175	175	175	175	175	175
Aug	366	374	374	374	374	374	374	374
Sep	169	179	179	179	179	179	179	179
Oct	192	205	206	206	205	206	206	205
Nov	212	226	226	226	226	226	226	226
Dec	191	203	205	205	203	205	205	205
Average	272	280	282	282	280	282	282	282
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	9 (7.8)	9 (7.8)	0 (0.0)	9 (7.8)	9 (7.8)	9 (7.8)
Feb	---	---	6 (4.2)	6 (4.2)	0 (0.0)	6 (4.2)	7 (4.9)	6 (4.2)
Mar	---	---	4 (2.8)	4 (2.8)	0 (0.0)	4 (2.8)	4 (2.8)	4 (2.8)
Apr	---	---	3 (1.3)	3 (1.3)	0 (0.0)	3 (1.3)	3 (1.3)	3 (1.3)
May	---	---	1 (0.4)	1 (0.4)	0 (0.0)	1 (0.4)	1 (0.4)	1 (0.4)
Jun	---	---	1 (0.1)	1 (0.1)	0 (0.0)	1 (0.1)	1 (0.1)	1 (0.1)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	1 (0.5)	1 (0.5)	0 (0.0)	1 (0.5)	1 (0.5)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	2 (1.0)	2 (1.0)	0 (0.0)	2 (1.0)	2 (1.0)	2 (1.0)
Average	---	---	2 (0.7)	2 (0.7)	0 (0.0)	2 (0.7)	2 (0.7)	2 (0.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	7 (6.4)	16 (14.7)	16 (14.7)	7 (6.4)	16 (14.7)	16 (14.7)	16 (14.7)
Feb	---	4 (2.9)	10 (7.2)	10 (7.2)	4 (2.9)	10 (7.2)	11 (7.9)	10 (7.2)
Mar	---	2 (1.4)	6 (4.3)	6 (4.3)	2 (1.4)	6 (4.3)	6 (4.3)	6 (4.3)
Apr	---	12 (5.6)	15 (7.0)	15 (7.0)	12 (5.6)	15 (7.0)	15 (7.0)	15 (7.0)
May	---	7 (2.6)	8 (2.9)	8 (2.9)	7 (2.6)	8 (2.9)	8 (2.9)	8 (2.9)
Jun	---	-4 (-0.4)	-3 (-0.3)	-3 (-0.3)	-4 (-0.4)	-3 (-0.3)	-3 (-0.3)	-3 (-0.3)
Jul	---	8 (4.8)	8 (4.8)	8 (4.8)	8 (4.8)	8 (4.8)	8 (4.8)	8 (4.8)
Aug	---	8 (2.2)	8 (2.2)	8 (2.2)	8 (2.2)	8 (2.2)	8 (2.2)	8 (2.2)
Sep	---	10 (5.9)	10 (5.9)	10 (5.9)	10 (5.9)	10 (5.9)	10 (5.9)	10 (5.9)
Oct	---	13 (6.8)	14 (7.3)	14 (7.3)	13 (6.8)	14 (7.3)	14 (7.3)	13 (6.8)
Nov	---	14 (6.6)	14 (6.6)	14 (6.6)	14 (6.6)	14 (6.6)	14 (6.6)	14 (6.6)
Dec	---	12 (6.3)	14 (7.3)	14 (7.3)	12 (6.3)	14 (7.3)	14 (7.3)	14 (7.3)
Average	---	8 (2.9)	10 (3.7)	10 (3.7)	8 (2.9)	10 (3.7)	10 (3.7)	10 (3.7)

Table 122. Monthly Streamflow Dry Year (2004) – Fountain Creek at Pueblo (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	80	88	99	99	88	99	99	99
Feb	110	113	125	125	113	125	125	122
Mar	104	107	119	119	107	119	118	115
Apr	273	276	287	289	276	287	286	286
May	85	94	102	103	94	102	102	102
Jun	157	161	163	163	161	163	163	163
Jul	324	326	328	329	326	328	328	328
Aug	323	321	322	322	321	322	322	322
Sep	80	82	83	83	82	83	83	83
Oct	73	86	87	87	86	87	86	86
Nov	111	123	123	124	123	123	123	123
Dec	80	90	92	93	90	92	92	92
Average	150	156	161	161	156	161	161	160
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	11 (12.5)	11 (12.5)	0 (0.0)	11 (12.5)	11 (12.5)	11 (12.5)
Feb	---	---	12 (10.6)	12 (10.6)	0 (0.0)	12 (10.6)	12 (10.6)	9 (8.0)
Mar	---	---	12 (11.2)	12 (11.2)	0 (0.0)	12 (11.2)	11 (10.3)	8 (7.5)
Apr	---	---	11 (4.0)	13 (4.7)	0 (0.0)	11 (4.0)	10 (3.6)	10 (3.6)
May	---	---	8 (8.5)	9 (9.6)	0 (0.0)	8 (8.5)	8 (8.5)	8 (8.5)
Jun	---	---	2 (1.2)	2 (1.2)	0 (0.0)	2 (1.2)	2 (1.2)	2 (1.2)
Jul	---	---	2 (0.6)	3 (0.9)	0 (0.0)	2 (0.6)	2 (0.6)	2 (0.6)
Aug	---	---	1 (0.3)	1 (0.3)	0 (0.0)	1 (0.3)	1 (0.3)	1 (0.3)
Sep	---	---	1 (1.2)	1 (1.2)	0 (0.0)	1 (1.2)	1 (1.2)	1 (1.2)
Oct	---	---	1 (1.2)	1 (1.2)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	2 (2.2)	3 (3.3)	0 (0.0)	2 (2.2)	2 (2.2)	2 (2.2)
Average	---	---	5 (3.2)	5 (3.2)	0 (0.0)	5 (3.2)	5 (3.2)	4 (2.6)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	8 (10.0)	19 (23.8)	19 (23.8)	8 (10.0)	19 (23.8)	19 (23.8)	19 (23.8)
Feb	---	3 (2.7)	15 (13.6)	15 (13.6)	3 (2.7)	15 (13.6)	15 (13.6)	12 (10.9)
Mar	---	3 (2.9)	15 (14.4)	15 (14.4)	3 (2.9)	15 (14.4)	14 (13.5)	11 (10.6)
Apr	---	3 (1.1)	14 (5.1)	16 (5.9)	3 (1.1)	14 (5.1)	13 (4.8)	13 (4.8)
May	---	9 (10.6)	17 (20.0)	18 (21.2)	9 (10.6)	17 (20.0)	17 (20.0)	17 (20.0)
Jun	---	4 (2.5)	6 (3.8)	6 (3.8)	4 (2.5)	6 (3.8)	6 (3.8)	6 (3.8)
Jul	---	2 (0.6)	4 (1.2)	5 (1.5)	2 (0.6)	4 (1.2)	4 (1.2)	4 (1.2)
Aug	---	-2 (-0.6)	-1 (-0.3)	-1 (-0.3)	-2 (-0.6)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Sep	---	2 (2.5)	3 (3.8)	3 (3.8)	2 (2.5)	3 (3.8)	3 (3.8)	3 (3.8)
Oct	---	13 (17.8)	14 (19.2)	14 (19.2)	13 (17.8)	14 (19.2)	13 (17.8)	13 (17.8)
Nov	---	12 (10.8)	12 (10.8)	13 (11.7)	12 (10.8)	12 (10.8)	12 (10.8)	12 (10.8)
Dec	---	10 (12.5)	12 (15.0)	13 (16.3)	10 (12.5)	12 (15.0)	12 (15.0)	12 (15.0)
Average	---	6 (4.0)	11 (7.3)	11 (7.3)	6 (4.0)	11 (7.3)	11 (7.3)	10 (6.7)

Table 123. Overall Average Monthly Streamflow – Fountain Creek at Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	125	202		202		202		201		202		205		204	
Feb	136	201		205		205		201		205		203		204	
Mar	151	226		225		225		226		225		225		224	
Apr	175	317		316		316		320		316		321		315	
May	274	465		475		476		474		476		465		469	
Jun	230	429		436		434		432		435		430		434	
Jul	160	276		278		277		274		279		279		280	
Aug	212	312		312		313		310		312		314		313	
Sep	110	185		184		185		183		183		188		187	
Oct	130	209		203		206		207		204		207		207	
Nov	141	227		225		223		223		225		226		225	
Dec	121	188		187		187		186		187		190		189	
Average	164	270		271		271		270		271		271		271	
Change in Streamflow Compared to No Action [cfs (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	-1	(-0.5)	0	(0.0)	3	(1.5)	2	(1.0)
Feb	---	---		4	(2.0)	4	(2.0)	0	(0.0)	4	(2.0)	2	(1.0)	3	(1.5)
Mar	---	---		-1	(-0.4)	-1	(-0.4)	0	(0.0)	-1	(-0.4)	-1	(-0.4)	-2	(-0.9)
Apr	---	---		-1	(-0.3)	-1	(-0.3)	3	(0.9)	-1	(-0.3)	4	(1.3)	-2	(-0.6)
May	---	---		10	(2.2)	11	(2.4)	9	(1.9)	11	(2.4)	0	(0.0)	4	(0.9)
Jun	---	---		7	(1.6)	5	(1.2)	3	(0.7)	6	(1.4)	1	(0.2)	5	(1.2)
Jul	---	---		2	(0.7)	1	(0.4)	-2	(-0.7)	3	(1.1)	3	(1.1)	4	(1.4)
Aug	---	---		0	(0.0)	1	(0.3)	-2	(-0.6)	0	(0.0)	2	(0.6)	1	(0.3)
Sep	---	---		-1	(-0.5)	0	(0.0)	-2	(-1.1)	-2	(-1.1)	3	(1.6)	2	(1.1)
Oct	---	---		-6	(-2.9)	-3	(-1.4)	-2	(-1.0)	-5	(-2.4)	-2	(-1.0)	-2	(-1.0)
Nov	---	---		-2	(-0.9)	-4	(-1.8)	-4	(-1.8)	-2	(-0.9)	-1	(-0.4)	-2	(-0.9)
Dec	---	---		-1	(-0.5)	-1	(-0.5)	-2	(-1.1)	-1	(-0.5)	2	(1.1)	1	(0.5)
Average	---	---		1	(0.4)	1	(0.4)	0	(0.0)	1	(0.4)	1	(0.4)	1	(0.4)
Change in Streamflow Compared to Existing Conditions [cfs (%)]															
Jan	---	77	(61.6)	77	(61.6)	77	(61.6)	76	(60.8)	77	(61.6)	80	(64.0)	79	(63.2)
Feb	---	65	(47.8)	69	(50.7)	69	(50.7)	65	(47.8)	69	(50.7)	67	(49.3)	68	(50.0)
Mar	---	75	(49.7)	74	(49.0)	74	(49.0)	75	(49.7)	74	(49.0)	74	(49.0)	73	(48.3)
Apr	---	142	(81.1)	141	(80.6)	141	(80.6)	145	(82.9)	141	(80.6)	146	(83.4)	140	(80.0)
May	---	191	(69.7)	201	(73.4)	202	(73.7)	200	(73.0)	202	(73.7)	191	(69.7)	195	(71.2)
Jun	---	199	(86.5)	206	(89.6)	204	(88.7)	202	(87.8)	205	(89.1)	200	(87.0)	204	(88.7)
Jul	---	116	(72.5)	118	(73.8)	117	(73.1)	114	(71.3)	119	(74.4)	119	(74.4)	120	(75.0)
Aug	---	100	(47.2)	100	(47.2)	101	(47.6)	98	(46.2)	100	(47.2)	102	(48.1)	101	(47.6)
Sep	---	75	(68.2)	74	(67.3)	75	(68.2)	73	(66.4)	73	(66.4)	78	(70.9)	77	(70.0)
Oct	---	79	(60.8)	73	(56.2)	76	(58.5)	77	(59.2)	74	(56.9)	77	(59.2)	77	(59.2)
Nov	---	86	(61.0)	84	(59.6)	82	(58.2)	82	(58.2)	84	(59.6)	85	(60.3)	84	(59.6)
Dec	---	67	(55.4)	66	(54.5)	66	(54.5)	65	(53.7)	66	(54.5)	69	(57.0)	68	(56.2)
Average	---	106	(64.6)	107	(65.2)	107	(65.2)	106	(64.6)	107	(65.2)	107	(65.2)	107	(65.2)

Table 124. Monthly Streamflow Normal Year (2005) – Fountain Creek at Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	113	141	156	155	153	154	144	144
Feb	117	193	210	210	205	210	183	188
Mar	103	191	191	192	191	192	192	191
Apr	172	258	261	262	259	262	262	261
May	131	327	332	332	327	332	323	331
Jun	130	502	498	497	490	494	504	502
Jul	31	162	163	164	173	167	166	160
Aug	141	225	224	226	226	226	227	225
Sep	30	74	68	70	69	69	76	73
Oct	94	158	151	151	155	151	155	156
Nov	93	131	125	124	129	125	132	129
Dec	84	93	92	92	92	92	95	93
Average	103	204	206	206	206	206	205	204
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	15 (10.6)	14 (9.9)	12 (8.5)	13 (9.2)	3 (2.1)	3 (2.1)
Feb	---	---	17 (8.8)	17 (8.8)	12 (6.2)	17 (8.8)	-10 (-5.2)	-5 (-2.6)
Mar	---	---	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.5)	1 (0.5)	0 (0.0)
Apr	---	---	3 (1.2)	4 (1.6)	1 (0.4)	4 (1.6)	4 (1.6)	3 (1.2)
May	---	---	5 (1.5)	5 (1.5)	0 (0.0)	5 (1.5)	-4 (-1.2)	4 (1.2)
Jun	---	---	-4 (-0.8)	-5 (-1.0)	-12 (-2.4)	-8 (-1.6)	2 (0.4)	0 (0.0)
Jul	---	---	1 (0.6)	2 (1.2)	11 (6.8)	5 (3.1)	4 (2.5)	-2 (-1.2)
Aug	---	---	-1 (-0.4)	1 (0.4)	1 (0.4)	1 (0.4)	2 (0.9)	0 (0.0)
Sep	---	---	-6 (-8.1)	-4 (-5.4)	-5 (-6.8)	-5 (-6.8)	2 (2.7)	-1 (-1.4)
Oct	---	---	-7 (-4.4)	-7 (-4.4)	-3 (-1.9)	-7 (-4.4)	-3 (-1.9)	-2 (-1.3)
Nov	---	---	-6 (-4.6)	-7 (-5.3)	-2 (-1.5)	-6 (-4.6)	1 (0.8)	-2 (-1.5)
Dec	---	---	-1 (-1.1)	-1 (-1.1)	-1 (-1.1)	-1 (-1.1)	2 (2.2)	0 (0.0)
Average	---	---	2 (1.0)	2 (1.0)	2 (1.0)	2 (1.0)	1 (0.5)	0 (0.0)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	28 (24.8)	43 (38.1)	42 (37.2)	40 (35.4)	41 (36.3)	31 (27.4)	31 (27.4)
Feb	---	76 (65.0)	93 (79.5)	93 (79.5)	88 (75.2)	93 (79.5)	66 (56.4)	71 (60.7)
Mar	---	88 (85.4)	88 (85.4)	89 (86.4)	88 (85.4)	89 (86.4)	89 (86.4)	88 (85.4)
Apr	---	86 (50.0)	89 (51.7)	90 (52.3)	87 (50.6)	90 (52.3)	90 (52.3)	89 (51.7)
May	---	196 (149.6)	201 (153.4)	201 (153.4)	196 (149.6)	201 (153.4)	192 (146.6)	200 (152.7)
Jun	---	372 (286.2)	368 (283.1)	367 (282.3)	360 (276.9)	364 (280.0)	374 (287.7)	372 (286.2)
Jul	---	131 (422.6)	132 (425.8)	133 (429.0)	142 (458.1)	136 (438.7)	135 (435.5)	129 (416.1)
Aug	---	84 (59.6)	83 (58.9)	85 (60.3)	85 (60.3)	85 (60.3)	86 (61.0)	84 (59.6)
Sep	---	44 (146.7)	38 (126.7)	40 (133.3)	39 (130.0)	39 (130.0)	46 (153.3)	43 (143.3)
Oct	---	64 (68.1)	57 (60.6)	57 (60.6)	61 (64.9)	57 (60.6)	61 (64.9)	62 (66.0)
Nov	---	38 (40.9)	32 (34.4)	31 (33.3)	36 (38.7)	32 (34.4)	39 (41.9)	36 (38.7)
Dec	---	9 (10.7)	8 (9.5)	8 (9.5)	8 (9.5)	8 (9.5)	11 (13.1)	9 (10.7)
Average	---	101 (98.1)	103 (100.0)	103 (100.0)	103 (100.0)	103 (100.0)	102 (99.0)	101 (98.1)

Table 125. Monthly Streamflow Wet Year (1997) – Fountain Creek at Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	109	180	181	180	180	180	182	181
Feb	139	201	206	203	200	206	206	207
Mar	141	299	291	290	298	289	293	290
Apr	214	587	585	583	587	584	591	589
May	272	427	471	468	442	476	437	455
Jun	1,100	1,211	1,210	1,212	1,211	1,210	1,212	1,210
Jul	167	279	279	280	279	279	280	279
Aug	366	470	468	470	470	469	472	471
Sep	169	255	257	259	255	257	259	257
Oct	192	285	277	278	283	278	281	281
Nov	212	377	385	383	379	384	379	380
Dec	191	275	274	274	274	274	277	276
Average	272	403	406	406	404	407	405	406
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.1)	1 (0.6)
Feb	---	---	5 (2.5)	2 (1.0)	-1 (-0.5)	5 (2.5)	5 (2.5)	6 (3.0)
Mar	---	---	-8 (-2.7)	-9 (-3.0)	-1 (-0.3)	-10 (-3.3)	-6 (-2.0)	-9 (-3.0)
Apr	---	---	-2 (-0.3)	-4 (-0.7)	0 (0.0)	-3 (-0.5)	4 (0.7)	2 (0.3)
May	---	---	44 (10.3)	41 (9.6)	15 (3.5)	49 (11.5)	10 (2.3)	28 (6.6)
Jun	---	---	-1 (-0.1)	1 (0.1)	0 (0.0)	-1 (-0.1)	1 (0.1)	-1 (-0.1)
Jul	---	---	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	1 (0.4)	0 (0.0)
Aug	---	---	-2 (-0.4)	0 (0.0)	0 (0.0)	-1 (-0.2)	2 (0.4)	1 (0.2)
Sep	---	---	2 (0.8)	4 (1.6)	0 (0.0)	2 (0.8)	4 (1.6)	2 (0.8)
Oct	---	---	-8 (-2.8)	-7 (-2.5)	-2 (-0.7)	-7 (-2.5)	-4 (-1.4)	-4 (-1.4)
Nov	---	---	8 (2.1)	6 (1.6)	2 (0.5)	7 (1.9)	2 (0.5)	3 (0.8)
Dec	---	---	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	-1 (-0.4)	2 (0.7)	1 (0.4)
Average	---	---	3 (0.7)	3 (0.7)	1 (0.2)	4 (1.0)	2 (0.5)	3 (0.7)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	71 (65.1)	72 (66.1)	71 (65.1)	71 (65.1)	71 (65.1)	73 (67.0)	72 (66.1)
Feb	---	62 (44.6)	67 (48.2)	64 (46.0)	61 (43.9)	67 (48.2)	67 (48.2)	68 (48.9)
Mar	---	158 (112.1)	150 (106.4)	149 (105.7)	157 (111.3)	148 (105.0)	152 (107.8)	149 (105.7)
Apr	---	373 (174.3)	371 (173.4)	369 (172.4)	373 (174.3)	370 (172.9)	377 (176.2)	375 (175.2)
May	---	155 (57.0)	199 (73.2)	196 (72.1)	170 (62.5)	204 (75.0)	165 (60.7)	183 (67.3)
Jun	---	111 (10.1)	110 (10.0)	112 (10.2)	111 (10.1)	110 (10.0)	112 (10.2)	110 (10.0)
Jul	---	112 (67.1)	112 (67.1)	113 (67.7)	112 (67.1)	112 (67.1)	113 (67.7)	112 (67.1)
Aug	---	104 (28.4)	102 (27.9)	104 (28.4)	104 (28.4)	103 (28.1)	106 (29.0)	105 (28.7)
Sep	---	86 (50.9)	88 (52.1)	90 (53.3)	86 (50.9)	88 (52.1)	90 (53.3)	88 (52.1)
Oct	---	93 (48.4)	85 (44.3)	86 (44.8)	91 (47.4)	86 (44.8)	89 (46.4)	89 (46.4)
Nov	---	165 (77.8)	173 (81.6)	171 (80.7)	167 (78.8)	172 (81.1)	167 (78.8)	168 (79.2)
Dec	---	84 (44.0)	83 (43.5)	83 (43.5)	83 (43.5)	83 (43.5)	86 (45.0)	85 (44.5)
Average	---	131 (48.2)	134 (49.3)	134 (49.3)	132 (48.5)	135 (49.6)	133 (48.9)	134 (49.3)

Table 126. Monthly Streamflow Dry Year (2004) – Fountain Creek at Pueblo (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	80	193	196	196	193	196	196	196
Feb	110	206	212	212	206	212	212	212
Mar	104	197	197	197	197	197	197	197
Apr	273	368	370	369	368	369	371	370
May	85	339	337	338	337	337	355	342
Jun	157	504	501	501	503	502	494	502
Jul	324	428	437	436	429	436	428	432
Aug	323	372	371	372	372	371	377	375
Sep	80	89	88	88	86	89	94	93
Oct	73	113	99	99	101	99	116	115
Nov	111	165	160	161	162	160	166	165
Dec	80	114	114	113	110	115	117	117
Average	150	257	257	257	255	257	260	260
Change in Streamflow Compared to No Action [cfs (%)]								
Jan	---	---	3 (1.6)	3 (1.6)	0 (0.0)	3 (1.6)	3 (1.6)	3 (1.6)
Feb	---	---	6 (2.9)	6 (2.9)	0 (0.0)	6 (2.9)	6 (2.9)	6 (2.9)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	2 (0.5)	1 (0.3)	0 (0.0)	1 (0.3)	3 (0.8)	2 (0.5)
May	---	---	-2 (-0.6)	-1 (-0.3)	-2 (-0.6)	-2 (-0.6)	16 (4.7)	3 (0.9)
Jun	---	---	-3 (-0.6)	-3 (-0.6)	-1 (-0.2)	-2 (-0.4)	-10 (-2.0)	-2 (-0.4)
Jul	---	---	9 (2.1)	8 (1.9)	1 (0.2)	8 (1.9)	0 (0.0)	4 (0.9)
Aug	---	---	-1 (-0.3)	0 (0.0)	0 (0.0)	-1 (-0.3)	5 (1.3)	3 (0.8)
Sep	---	---	-1 (-1.1)	-1 (-1.1)	-3 (-3.4)	0 (0.0)	5 (5.6)	4 (4.5)
Oct	---	---	-14 (-12.4)	-14 (-12.4)	-12 (-10.6)	-14 (-12.4)	3 (2.7)	2 (1.8)
Nov	---	---	-5 (-3.0)	-4 (-2.4)	-3 (-1.8)	-5 (-3.0)	1 (0.6)	0 (0.0)
Dec	---	---	0 (0.0)	-1 (-0.9)	-4 (-3.5)	1 (0.9)	3 (2.6)	3 (2.6)
Average	---	---	0 (0.0)	0 (0.0)	-2 (-0.8)	0 (0.0)	3 (1.2)	3 (1.2)
Change in Streamflow Compared to Existing Conditions [cfs (%)]								
Jan	---	113 (141.3)	116 (145.0)	116 (145.0)	113 (141.3)	116 (145.0)	116 (145.0)	116 (145.0)
Feb	---	96 (87.3)	102 (92.7)	102 (92.7)	96 (87.3)	102 (92.7)	102 (92.7)	102 (92.7)
Mar	---	93 (89.4)	93 (89.4)	93 (89.4)	93 (89.4)	93 (89.4)	93 (89.4)	93 (89.4)
Apr	---	95 (34.8)	97 (35.5)	96 (35.2)	95 (34.8)	96 (35.2)	98 (35.9)	97 (35.5)
May	---	254 (298.8)	252 (296.5)	253 (297.6)	252 (296.5)	252 (296.5)	270 (317.6)	257 (302.4)
Jun	---	347 (221.0)	344 (219.1)	344 (219.1)	346 (220.4)	345 (219.7)	337 (214.6)	345 (219.7)
Jul	---	104 (32.1)	113 (34.9)	112 (34.6)	105 (32.4)	112 (34.6)	104 (32.1)	108 (33.3)
Aug	---	49 (15.2)	48 (14.9)	49 (15.2)	49 (15.2)	48 (14.9)	54 (16.7)	52 (16.1)
Sep	---	9 (11.3)	8 (10.0)	8 (10.0)	6 (7.5)	9 (11.3)	14 (17.5)	13 (16.3)
Oct	---	40 (54.8)	26 (35.6)	26 (35.6)	28 (38.4)	26 (35.6)	43 (58.9)	42 (57.5)
Nov	---	54 (48.6)	49 (44.1)	50 (45.0)	51 (45.9)	49 (44.1)	55 (49.5)	54 (48.6)
Dec	---	34 (42.5)	34 (42.5)	33 (41.3)	30 (37.5)	35 (43.8)	37 (46.3)	37 (46.3)
Average	---	107 (71.3)	107 (71.3)	107 (71.3)	105 (70.0)	107 (71.3)	110 (73.3)	110 (73.3)

Reservoir Effects

This section describes simulated reservoir contents at the major reservoir nodes within the model. Most of the summary information contained herein is simulated reservoir contents, which is a direct output of the Daily Model. Indirect output for reservoirs includes estimated water depth, water surface elevation, and surface area corresponding to the simulated reservoir contents at several of the reservoirs. This data was calculated from direct model output and established rating curves from the Office of the State Engineer (Colorado Department of Wildlife 2003) and can be found at the AVC hydrology website. Effects for water surface elevations were calculated as shown below. These are seen on the website and are not discussed in this document.

$$\text{Effects} = \text{Alternative WSEL} - \text{No Action WSEL}$$

$$\text{Effects (\%)} = \frac{\text{Alternative WSEL} - \text{No Action WSEL}}{\text{No Action Depth}}$$

The Daily Model simulates the operations of Arkansas River Basin Fry-Ark reservoirs, including Turquoise Reservoir, Twin Lakes Reservoir, and Pueblo Reservoir. The reservoirs are owned and operated by Reclamation as part of the Fry-Ark Project. Mean annual storage for the major reservoirs along the Arkansas River is presented in Table 127 for the direct effects analysis and Table 128 for the cumulative effects analysis. As shown, there is very little difference in storage for most of the alternatives when compared to the No Action Alternative on an average annual basis. Storage under the cumulative effects is less than the direct effects in all reservoirs due to the higher demands simulated by all Arkansas basin municipalities in the cumulative effects analysis. Differences between the alternatives are similar to those seen in the direct effects. These reservoirs are described in more detail below.

Table 127. Mean Annual Storage (Direct Effects).

Location	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Turquoise Reservoir	94,700	94,300	94,900	94,600	93,800	95,000	95,000	95,000
Twin Lakes Reservoir	108,200	107,100	107,300	107,300	107,100	107,300	107,300	107,400
Pueblo Reservoir	203,300	198,800	200,800	197,200	182,000	201,100	202,500	209,100
Total Fry-Ark	406,200	400,200	403,000	399,100	382,900	403,400	404,800	411,500
Lake Henry	8,300	8,400	8,300	8,300	8,500	8,300	8,300	8,300
Lake Meredith	34,800	35,100	34,700	34,800	35,400	34,600	34,700	34,600
Total Colorado Canal	43,100	43,500	43,000	43,100	43,900	42,900	43,000	42,900
Holbrook Reservoir	3,300	3,100	3,100	3,100	3,100	3,100	3,100	3,100
Effects (ac-ft) (Alternative – No Action)								
Turquoise Reservoir	---	---	600	300	-500	700	700	700
Twin Lakes Reservoir	---	---	200	200	0	200	200	300
Pueblo Reservoir	---	---	2,000	-1,600	-16,800	2,300	3,700	10,300
Total Fry-Ark	---	---	2,800	-1,100	-17,300	3,200	4,600	11,300
Lake Henry	---	---	-100	-100	100	-100	-100	-100
Lake Meredith	---	---	-400	-300	300	-500	-400	-500
Total Colorado Canal	---	---	-500	-400	400	-600	-500	-600
Holbrook Reservoir	---	---	0	0	0	0	0	0
Effects (%) (Alternative - No Action / No Action)								
Turquoise Reservoir	---	---	0.6	0.3	-0.5	0.7	0.7	0.7
Twin Lakes Reservoir	---	---	0.2	0.2	0.0	0.2	0.2	0.3
Pueblo Reservoir	---	---	1.0	-0.8	-8.5	1.2	1.9	5.2
Total Fry-Ark	---	---	0.7	-0.3	-4.3	0.8	1.1	2.8
Lake Henry	---	---	-1.2	-1.2	1.2	-1.2	-1.2	-1.2
Lake Meredith	---	---	-1.1	-0.9	0.9	-1.4	-1.1	-1.4
Total Colorado Canal	---	---	-1.1	-0.9	0.9	-1.4	-1.1	-1.4
Holbrook Reservoir	---	---	0.0	0.0	0.0	0.0	0.0	0.0

Table 128. Mean Annual Storage (Cumulative Effects).

Location	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Turquoise Reservoir	94,700	87,000	87,000	86,700	85,900	86,900	86,500	87,600
Twin Lakes Reservoir	108,200	99,100	98,900	99,000	98,800	98,900	99,100	99,000
Pueblo Reservoir	203,300	156,100	154,900	152,600	145,500	154,600	155,600	164,900
Total Fry-Ark	406,200	342,200	340,800	338,300	330,200	340,400	341,200	351,500
Lake Henry	8,300	5,900	6,000	5,900	6,000	5,900	5,800	5,800
Lake Meredith	34,800	28,400	28,400	28,400	29,000	28,300	28,000	28,000
Total Colorado Canal	43,100	34,300	34,400	34,300	35,000	34,200	33,800	33,800
Holbrook Reservoir	3,300	2,900	2,900	2,900	2,900	2,900	2,900	2,900
Effects (ac-ft) (Alternative – No Action)								
Turquoise Reservoir	---	---	0	-300	-1,100	-100	-500	600
Twin Lakes Reservoir	---	---	-200	-100	-300	-200	0	-100
Pueblo Reservoir	---	---	-1,200	-3,500	-10,600	-1,500	-500	8,800
Total Fry-Ark	---	---	-1,400	-3,900	-12,000	-1,800	-1,000	9,300
Lake Henry	---	---	100	0	100	0	-100	-100
Lake Meredith	---	---	0	0	600	-100	-400	-400
Total Colorado Canal	---	---	100	0	700	-100	-500	-500
Holbrook Reservoir	---	---	0	0	0	0	0	0
Effects (%) (Alternative - No Action / No Action)								
Turquoise Reservoir	---	---	0.0	-0.3	-1.3	-0.1	-0.6	0.7
Twin Lakes Reservoir	---	---	-0.2	-0.1	-0.3	-0.2	0.0	-0.1
Pueblo Reservoir	---	---	-0.8	-2.2	-6.8	-1.0	-0.3	5.6
Total Fry-Ark	---	---	-0.4	-1.1	-3.5	-0.5	-0.3	2.7
Lake Henry	---	---	1.7	0.0	1.7	0.0	-1.7	-1.7
Lake Meredith	---	---	0.0	0.0	2.1	-0.4	-1.4	-1.4
Total Colorado Canal	---	---	0.3	0.0	2.0	-0.3	-1.5	-1.5
Holbrook Reservoir	---	---	0.0	0.0	0.0	0.0	0.0	0.0

Fry-Ark Reservoirs

Turquoise Reservoir

Turquoise Reservoir is located on Lake Fork Creek, a tributary of the Arkansas River near Leadville, and is the uppermost reservoir in the Fry-Ark Project. The reservoir typically diverts a small amount of native streamflow from Lake Fork and is the receiving reservoir for transmountain imports from the Homestake Tunnel, Boustead Tunnel (Fry-Ark Project imports), and the Busk-Ivanhoe Tunnel.

Direct effects storage contents for Turquoise Reservoir are presented in Table 129 through Table 132. Most effects are negligible for this reservoir. Upper Basin reservoirs are not greatly affected by operations of Master Contract of the AVC. Some minor effects occur during the typical wet year of 1997 between January and May. All alternatives with a Master Contract in Pueblo Reservoir have slightly greater storage than the No Action Alternative. Alternatives without a Master Contract rely more heavily on Fry-Ark project water and use Fry-Ark water in Turquoise in the wet year during the time when the other alternatives are storing the higher runoff. The same is seen in the dry year of 2004, to a lesser degree.

Cumulative effects for storage in Turquoise Reservoir are shown in Table 133 through Table 136. Cumulative effects storage is negligible to minor for all alternatives.

Table 129. Monthly Storage Contents Overall Average – Turquoise Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	88,400	88,100	88,600	88,400	87,500	88,700	88,700	88,700
Feb	80,400	80,200	80,700	80,500	79,600	80,700	80,800	80,800
Mar	77,400	77,200	77,800	77,500	76,300	77,900	78,100	78,100
Apr	75,100	74,800	75,600	75,200	73,800	75,700	75,800	75,900
May	77,800	77,600	78,300	77,900	76,500	78,400	78,600	78,800
Jun	100,200	99,800	100,300	99,900	99,400	100,400	100,500	100,500
Jul	113,300	112,700	113,100	112,900	112,500	113,200	113,300	113,400
Aug	109,100	108,700	109,200	108,900	108,600	109,200	109,300	109,200
Sep	106,700	106,200	106,700	106,400	106,100	106,900	106,900	106,800
Oct	106,100	105,600	106,200	105,900	105,600	106,300	106,300	106,200
Nov	103,500	102,900	103,600	103,200	102,800	103,600	103,600	103,500
Dec	97,000	96,500	97,200	96,900	96,200	97,300	97,300	97,200
Average	94,700	94,300	94,900	94,600	93,800	95,000	95,000	95,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	500 (0.6)	300 (0.3)	-600 (-0.7)	600 (0.7)	600 (0.7)	600 (0.7)
Feb	---	---	500 (0.6)	300 (0.4)	-600 (-0.7)	500 (0.6)	600 (0.7)	600 (0.7)
Mar	---	---	600 (0.8)	300 (0.4)	-900 (-1.2)	700 (0.9)	900 (1.2)	900 (1.2)
Apr	---	---	800 (1.1)	400 (0.5)	-1,000 (-1.3)	900 (1.2)	1,000 (1.3)	1,100 (1.5)
May	---	---	700 (0.9)	300 (0.4)	-1,100 (-1.4)	800 (1.0)	1,000 (1.3)	1,200 (1.5)
Jun	---	---	500 (0.5)	100 (0.1)	-400 (-0.4)	600 (0.6)	700 (0.7)	700 (0.7)
Jul	---	---	400 (0.4)	200 (0.2)	-200 (-0.2)	500 (0.4)	600 (0.5)	700 (0.6)
Aug	---	---	500 (0.5)	200 (0.2)	-100 (-0.1)	500 (0.5)	600 (0.6)	500 (0.5)
Sep	---	---	500 (0.5)	200 (0.2)	-100 (-0.1)	700 (0.7)	700 (0.7)	600 (0.6)
Oct	---	---	600 (0.6)	300 (0.3)	0 (0.0)	700 (0.7)	700 (0.7)	600 (0.6)
Nov	---	---	700 (0.7)	300 (0.3)	-100 (-0.1)	700 (0.7)	700 (0.7)	600 (0.6)
Dec	---	---	700 (0.7)	400 (0.4)	-300 (-0.3)	800 (0.8)	800 (0.8)	700 (0.7)
Average	---	---	600 (0.6)	300 (0.3)	-500 (-0.5)	700 (0.7)	700 (0.7)	700 (0.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-300 (-0.3)	200 (0.2)	0 (0.0)	-900 (-1.0)	300 (0.3)	300 (0.3)	300 (0.3)
Feb	---	-200 (-0.2)	300 (0.4)	100 (0.1)	-800 (-1.0)	300 (0.4)	400 (0.5)	400 (0.5)
Mar	---	-200 (-0.3)	400 (0.5)	100 (0.1)	-1,100 (-1.4)	500 (0.6)	700 (0.9)	700 (0.9)
Apr	---	-300 (-0.4)	500 (0.7)	100 (0.1)	-1,300 (-1.7)	600 (0.8)	700 (0.9)	800 (1.1)
May	---	-200 (-0.3)	500 (0.6)	100 (0.1)	-1,300 (-1.7)	600 (0.8)	800 (1.0)	1,000 (1.3)
Jun	---	-400 (-0.4)	100 (0.1)	-300 (-0.3)	-800 (-0.8)	200 (0.2)	300 (0.3)	300 (0.3)
Jul	---	-600 (-0.5)	-200 (-0.2)	-400 (-0.4)	-800 (-0.7)	-100 (-0.1)	0 (0.0)	100 (0.1)
Aug	---	-400 (-0.4)	100 (0.1)	-200 (-0.2)	-500 (-0.5)	100 (0.1)	200 (0.2)	100 (0.1)
Sep	---	-500 (-0.5)	0 (0.0)	-300 (-0.3)	-600 (-0.6)	200 (0.2)	200 (0.2)	100 (0.1)
Oct	---	-500 (-0.5)	100 (0.1)	-200 (-0.2)	-500 (-0.5)	200 (0.2)	200 (0.2)	100 (0.1)
Nov	---	-600 (-0.6)	100 (0.1)	-300 (-0.3)	-700 (-0.7)	100 (0.1)	100 (0.1)	0 (0.0)
Dec	---	-500 (-0.5)	200 (0.2)	-100 (-0.1)	-800 (-0.8)	300 (0.3)	300 (0.3)	200 (0.2)
Average	---	-400 (-0.4)	200 (0.2)	-100 (-0.1)	-900 (-1.0)	300 (0.3)	300 (0.3)	300 (0.3)

Table 130. Monthly Storage Contents Normal Year (2005) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	49,000	51,000	50,800	51,000	50,700	51,000	51,000	50,600
Feb	44,300	46,200	46,000	46,200	45,900	46,200	46,200	45,800
Mar	39,600	41,300	40,900	41,000	41,000	41,000	41,000	40,600
Apr	35,500	37,200	36,500	36,700	36,900	36,700	36,700	36,300
May	37,400	39,500	38,600	38,700	39,200	38,800	38,800	38,300
Jun	66,500	68,200	67,400	67,600	68,000	67,600	67,700	67,100
Jul	90,300	91,500	90,900	91,000	91,300	91,100	91,100	90,600
Aug	84,400	85,600	84,900	85,000	85,300	85,100	85,200	84,700
Sep	80,600	81,800	81,100	81,200	81,400	81,300	81,300	80,800
Oct	85,400	85,100	84,600	84,600	84,800	84,700	84,700	84,400
Nov	83,800	83,400	82,900	82,900	83,100	83,000	83,000	82,700
Dec	75,400	75,100	74,700	74,700	74,900	74,800	74,800	74,500
Average	64,500	65,600	65,100	65,200	65,300	65,200	65,300	64,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-200 (-0.4)	0 (0.0)	-300 (-0.6)	0 (0.0)	0 (0.0)	-400 (-0.8)
Feb	---	---	-200 (-0.4)	0 (0.0)	-300 (-0.6)	0 (0.0)	0 (0.0)	-400 (-0.9)
Mar	---	---	-400 (-1.0)	-300 (-0.7)	-300 (-0.7)	-300 (-0.7)	-300 (-0.7)	-700 (-1.7)
Apr	---	---	-700 (-1.9)	-500 (-1.3)	-300 (-0.8)	-500 (-1.3)	-500 (-1.3)	-900 (-2.4)
May	---	---	-900 (-2.3)	-800 (-2.0)	-300 (-0.8)	-700 (-1.8)	-700 (-1.8)	-1,200 (-3.0)
Jun	---	---	-800 (-1.2)	-600 (-0.9)	-200 (-0.3)	-600 (-0.9)	-500 (-0.7)	-1,100 (-1.6)
Jul	---	---	-600 (-0.7)	-500 (-0.5)	-200 (-0.2)	-400 (-0.4)	-400 (-0.4)	-900 (-1.0)
Aug	---	---	-700 (-0.8)	-600 (-0.7)	-300 (-0.4)	-500 (-0.6)	-400 (-0.5)	-900 (-1.1)
Sep	---	---	-700 (-0.9)	-600 (-0.7)	-400 (-0.5)	-500 (-0.6)	-500 (-0.6)	-1,000 (-1.2)
Oct	---	---	-500 (-0.6)	-500 (-0.6)	-300 (-0.4)	-400 (-0.5)	-400 (-0.5)	-700 (-0.8)
Nov	---	---	-500 (-0.6)	-500 (-0.6)	-300 (-0.4)	-400 (-0.5)	-400 (-0.5)	-700 (-0.8)
Dec	---	---	-400 (-0.5)	-400 (-0.5)	-200 (-0.3)	-300 (-0.4)	-300 (-0.4)	-600 (-0.8)
Average	---	---	-500 (-0.8)	-400 (-0.6)	-300 (-0.5)	-400 (-0.6)	-300 (-0.5)	-800 (-1.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	2,000 (4.1)	1,800 (3.7)	2,000 (4.1)	1,700 (3.5)	2,000 (4.1)	2,000 (4.1)	1,600 (3.3)
Feb	---	1,900 (4.3)	1,700 (3.8)	1,900 (4.3)	1,600 (3.6)	1,900 (4.3)	1,900 (4.3)	1,500 (3.4)
Mar	---	1,700 (4.3)	1,300 (3.3)	1,400 (3.5)	1,400 (3.5)	1,400 (3.5)	1,400 (3.5)	1,000 (2.5)
Apr	---	1,700 (4.8)	1,000 (2.8)	1,200 (3.4)	1,400 (3.9)	1,200 (3.4)	1,200 (3.4)	800 (2.3)
May	---	2,100 (5.6)	1,200 (3.2)	1,300 (3.5)	1,800 (4.8)	1,400 (3.7)	1,400 (3.7)	900 (2.4)
Jun	---	1,700 (2.6)	900 (1.4)	1,100 (1.7)	1,500 (2.3)	1,100 (1.7)	1,200 (1.8)	600 (0.9)
Jul	---	1,200 (1.3)	600 (0.7)	700 (0.8)	1,000 (1.1)	800 (0.9)	800 (0.9)	300 (0.3)
Aug	---	1,200 (1.4)	500 (0.6)	600 (0.7)	900 (1.1)	700 (0.8)	800 (0.9)	300 (0.4)
Sep	---	1,200 (1.5)	500 (0.6)	600 (0.7)	800 (1.0)	700 (0.9)	700 (0.9)	200 (0.2)
Oct	---	-300 (-0.4)	-800 (-0.9)	-800 (-0.9)	-600 (-0.7)	-700 (-0.8)	-700 (-0.8)	-1,000 (-1.2)
Nov	---	-400 (-0.5)	-900 (-1.1)	-900 (-1.1)	-700 (-0.8)	-800 (-1.0)	-800 (-1.0)	-1,100 (-1.3)
Dec	---	-300 (-0.4)	-700 (-0.9)	-700 (-0.9)	-500 (-0.7)	-600 (-0.8)	-600 (-0.8)	-900 (-1.2)
Average	---	1,100 (1.7)	600 (0.9)	700 (1.1)	800 (1.2)	700 (1.1)	800 (1.2)	300 (0.5)

Table 131. Monthly Storage Contents Wet Year (1997) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	101,100	101,200	103,000	103,000	100,800	103,000	103,000	103,200
Feb	98,100	98,000	100,500	100,500	96,800	100,500	100,500	100,800
Mar	101,000	100,500	103,100	103,000	99,100	103,100	103,000	103,400
Apr	97,500	96,900	100,400	100,300	94,600	100,400	100,300	101,200
May	98,600	97,800	101,900	101,700	95,300	101,900	101,700	102,800
Jun	124,900	124,400	126,200	126,200	123,100	126,200	126,200	126,500
Jul	128,800	128,800	128,800	128,800	128,800	128,800	128,800	129,100
Aug	123,500	123,300	123,400	123,400	123,200	123,400	123,400	123,800
Sep	118,700	118,200	118,400	118,400	118,200	118,400	118,400	118,900
Oct	118,500	117,900	118,100	118,100	117,900	118,100	118,100	118,600
Nov	116,200	115,600	115,900	115,900	115,600	115,900	115,900	116,400
Dec	110,100	109,400	109,800	109,800	109,400	109,800	109,800	110,200
Average	111,500	111,100	112,500	112,500	110,300	112,500	112,500	113,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,800 (1.8)	1,800 (1.8)	-400 (-0.4)	1,800 (1.8)	1,800 (1.8)	2,000 (2.0)
Feb	---	---	2,500 (2.6)	2,500 (2.6)	-1,200 (-1.2)	2,500 (2.6)	2,500 (2.6)	2,800 (2.9)
Mar	---	---	2,600 (2.6)	2,500 (2.5)	-1,400 (-1.4)	2,600 (2.6)	2,500 (2.5)	2,900 (2.9)
Apr	---	---	3,500 (3.6)	3,400 (3.5)	-2,300 (-2.4)	3,500 (3.6)	3,400 (3.5)	4,300 (4.4)
May	---	---	4,100 (4.2)	3,900 (4.0)	-2,500 (-2.6)	4,100 (4.2)	3,900 (4.0)	5,000 (5.1)
Jun	---	---	1,800 (1.4)	1,800 (1.4)	-1,300 (-1.0)	1,800 (1.4)	1,800 (1.4)	2,100 (1.7)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	300 (0.2)
Aug	---	---	100 (0.1)	100 (0.1)	-100 (-0.1)	100 (0.1)	100 (0.1)	500 (0.4)
Sep	---	---	200 (0.2)	200 (0.2)	0 (0.0)	200 (0.2)	200 (0.2)	700 (0.6)
Oct	---	---	200 (0.2)	200 (0.2)	0 (0.0)	200 (0.2)	200 (0.2)	700 (0.6)
Nov	---	---	300 (0.3)	300 (0.3)	0 (0.0)	300 (0.3)	300 (0.3)	800 (0.7)
Dec	---	---	400 (0.4)	400 (0.4)	0 (0.0)	400 (0.4)	400 (0.4)	800 (0.7)
Average	---	---	1,400 (1.3)	1,400 (1.3)	-800 (-0.7)	1,400 (1.3)	1,400 (1.3)	1,900 (1.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	100 (0.1)	1,900 (1.9)	1,900 (1.9)	-300 (-0.3)	1,900 (1.9)	1,900 (1.9)	2,100 (2.1)
Feb	---	-100 (-0.1)	2,400 (2.4)	2,400 (2.4)	-1,300 (-1.3)	2,400 (2.4)	2,400 (2.4)	2,700 (2.8)
Mar	---	-500 (-0.5)	2,100 (2.1)	2,000 (2.0)	-1,900 (-1.9)	2,100 (2.1)	2,000 (2.0)	2,400 (2.4)
Apr	---	-600 (-0.6)	2,900 (3.0)	2,800 (2.9)	-2,900 (-3.0)	2,900 (3.0)	2,800 (2.9)	3,700 (3.8)
May	---	-800 (-0.8)	3,300 (3.3)	3,100 (3.1)	-3,300 (-3.3)	3,300 (3.3)	3,100 (3.1)	4,200 (4.3)
Jun	---	-500 (-0.4)	1,300 (1.0)	1,300 (1.0)	-1,800 (-1.4)	1,300 (1.0)	1,300 (1.0)	1,600 (1.3)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	300 (0.2)
Aug	---	-200 (-0.2)	-100 (-0.1)	-100 (-0.1)	-300 (-0.2)	-100 (-0.1)	-100 (-0.1)	300 (0.2)
Sep	---	-500 (-0.4)	-300 (-0.3)	-300 (-0.3)	-500 (-0.4)	-300 (-0.3)	-300 (-0.3)	200 (0.2)
Oct	---	-600 (-0.5)	-400 (-0.3)	-400 (-0.3)	-600 (-0.5)	-400 (-0.3)	-400 (-0.3)	100 (0.1)
Nov	---	-600 (-0.5)	-300 (-0.3)	-300 (-0.3)	-600 (-0.5)	-300 (-0.3)	-300 (-0.3)	200 (0.2)
Dec	---	-700 (-0.6)	-300 (-0.3)	-300 (-0.3)	-700 (-0.6)	-300 (-0.3)	-300 (-0.3)	100 (0.1)
Average	---	-400 (-0.4)	1,000 (0.9)	1,000 (0.9)	-1,200 (-1.1)	1,000 (0.9)	1,000 (0.9)	1,500 (1.3)

Table 132. Monthly Storage Contents Dry Year (2004) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	51,700	52,300	53,400	53,500	52,000	53,500	53,600	53,100
Feb	46,800	47,500	48,500	48,600	47,200	48,600	48,700	48,200
Mar	42,600	43,400	44,200	44,400	43,100	44,400	44,400	43,900
Apr	39,300	40,300	41,000	41,100	40,000	41,100	41,100	40,700
May	46,800	47,700	48,200	48,400	47,400	48,400	48,300	47,900
Jun	65,800	66,500	67,000	67,200	66,100	67,200	67,200	66,700
Jul	64,000	65,100	65,500	65,600	64,700	65,700	65,600	65,200
Aug	54,100	55,100	55,400	55,600	54,800	55,600	55,500	55,100
Sep	49,600	51,300	51,300	51,500	51,000	51,500	51,400	51,000
Oct	49,800	51,800	51,600	51,700	51,400	51,800	51,700	51,300
Nov	52,000	53,900	53,700	53,900	53,600	53,900	53,900	53,500
Dec	51,500	53,500	53,300	53,400	53,100	53,500	53,400	53,000
Average	51,200	52,400	52,800	52,900	52,100	53,000	52,900	52,500
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,100 (2.1)	1,200 (2.3)	-300 (-0.6)	1,200 (2.3)	1,300 (2.5)	800 (1.5)
Feb	---	---	1,000 (2.1)	1,100 (2.3)	-300 (-0.6)	1,100 (2.3)	1,200 (2.5)	700 (1.5)
Mar	---	---	800 (1.8)	1,000 (2.3)	-300 (-0.7)	1,000 (2.3)	1,000 (2.3)	500 (1.2)
Apr	---	---	700 (1.7)	800 (2.0)	-300 (-0.7)	800 (2.0)	800 (2.0)	400 (1.0)
May	---	---	500 (1.0)	700 (1.5)	-300 (-0.6)	700 (1.5)	600 (1.3)	200 (0.4)
Jun	---	---	500 (0.8)	700 (1.1)	-400 (-0.6)	700 (1.1)	700 (1.1)	200 (0.3)
Jul	---	---	400 (0.6)	500 (0.8)	-400 (-0.6)	600 (0.9)	500 (0.8)	100 (0.2)
Aug	---	---	300 (0.5)	500 (0.9)	-300 (-0.5)	500 (0.9)	400 (0.7)	0 (0.0)
Sep	---	---	0 (0.0)	200 (0.4)	-300 (-0.6)	200 (0.4)	100 (0.2)	-300 (-0.6)
Oct	---	---	-200 (-0.4)	-100 (-0.2)	-400 (-0.8)	0 (0.0)	-100 (-0.2)	-500 (-1.0)
Nov	---	---	-200 (-0.4)	0 (0.0)	-300 (-0.6)	0 (0.0)	0 (0.0)	-400 (-0.7)
Dec	---	---	-200 (-0.4)	-100 (-0.2)	-400 (-0.7)	0 (0.0)	-100 (-0.2)	-500 (-0.9)
Average	---	---	400 (0.8)	500 (1.0)	-300 (-0.6)	600 (1.1)	500 (1.0)	100 (0.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	600 (1.2)	1,700 (3.3)	1,800 (3.5)	300 (0.6)	1,800 (3.5)	1,900 (3.7)	1,400 (2.7)
Feb	---	700 (1.5)	1,700 (3.6)	1,800 (3.8)	400 (0.9)	1,800 (3.8)	1,900 (4.1)	1,400 (3.0)
Mar	---	800 (1.9)	1,600 (3.8)	1,800 (4.2)	500 (1.2)	1,800 (4.2)	1,800 (4.2)	1,300 (3.1)
Apr	---	1,000 (2.5)	1,700 (4.3)	1,800 (4.6)	700 (1.8)	1,800 (4.6)	1,800 (4.6)	1,400 (3.6)
May	---	900 (1.9)	1,400 (3.0)	1,600 (3.4)	600 (1.3)	1,600 (3.4)	1,500 (3.2)	1,100 (2.4)
Jun	---	700 (1.1)	1,200 (1.8)	1,400 (2.1)	300 (0.5)	1,400 (2.1)	1,400 (2.1)	900 (1.4)
Jul	---	1,100 (1.7)	1,500 (2.3)	1,600 (2.5)	700 (1.1)	1,700 (2.7)	1,600 (2.5)	1,200 (1.9)
Aug	---	1,000 (1.8)	1,300 (2.4)	1,500 (2.8)	700 (1.3)	1,500 (2.8)	1,400 (2.6)	1,000 (1.8)
Sep	---	1,700 (3.4)	1,700 (3.4)	1,900 (3.8)	1,400 (2.8)	1,900 (3.8)	1,800 (3.6)	1,400 (2.8)
Oct	---	2,000 (4.0)	1,800 (3.6)	1,900 (3.8)	1,600 (3.2)	2,000 (4.0)	1,900 (3.8)	1,500 (3.0)
Nov	---	1,900 (3.7)	1,700 (3.3)	1,900 (3.7)	1,600 (3.1)	1,900 (3.7)	1,900 (3.7)	1,500 (2.9)
Dec	---	2,000 (3.9)	1,800 (3.5)	1,900 (3.7)	1,600 (3.1)	2,000 (3.9)	1,900 (3.7)	1,500 (2.9)
Average	---	1,200 (2.3)	1,600 (3.1)	1,700 (3.3)	900 (1.8)	1,800 (3.5)	1,700 (3.3)	1,300 (2.5)

Table 133. Monthly Storage Contents Overall Average – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	88,400	76,400	76,200	76,100	75,700	76,300	76,000	76,900
Feb	80,400	67,000	66,900	66,600	65,900	66,900	66,600	68,000
Mar	77,400	64,300	64,200	63,800	62,800	64,100	63,700	65,600
Apr	75,100	61,200	61,200	60,800	59,500	61,100	60,600	62,600
May	77,800	63,100	63,100	62,600	61,300	62,900	62,400	64,500
Jun	100,200	91,700	91,700	91,200	90,000	91,600	91,100	92,600
Jul	113,300	111,100	111,200	110,800	110,100	111,100	110,500	111,100
Aug	109,100	108,400	108,500	108,200	107,600	108,400	107,900	108,500
Sep	106,700	105,700	105,800	105,600	105,000	105,700	105,200	106,000
Oct	106,100	104,400	104,500	104,300	103,700	104,500	104,000	104,800
Nov	103,500	99,700	99,800	99,600	99,100	99,700	99,400	100,000
Dec	97,000	89,100	89,000	88,900	88,500	89,000	88,800	89,300
Average	94,700	87,000	87,000	86,700	85,900	86,900	86,500	87,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-200 (-0.3)	-300 (-0.4)	-700 (-0.9)	-100 (-0.1)	-400 (-0.5)	500 (0.7)
Feb	---	---	-100 (-0.1)	-400 (-0.6)	-1,100 (-1.6)	-100 (-0.1)	-400 (-0.6)	1,000 (1.5)
Mar	---	---	-100 (-0.2)	-500 (-0.8)	-1,500 (-2.3)	-200 (-0.3)	-600 (-0.9)	1,300 (2.0)
Apr	---	---	0 (0.0)	-400 (-0.7)	-1,700 (-2.8)	-100 (-0.2)	-600 (-1.0)	1,400 (2.3)
May	---	---	0 (0.0)	-500 (-0.8)	-1,800 (-2.9)	-200 (-0.3)	-700 (-1.1)	1,400 (2.2)
Jun	---	---	0 (0.0)	-500 (-0.5)	-1,700 (-1.9)	-100 (-0.1)	-600 (-0.7)	900 (1.0)
Jul	---	---	100 (0.1)	-300 (-0.3)	-1,000 (-0.9)	0 (0.0)	-600 (-0.5)	0 (0.0)
Aug	---	---	100 (0.1)	-200 (-0.2)	-800 (-0.7)	0 (0.0)	-500 (-0.5)	100 (0.1)
Sep	---	---	100 (0.1)	-100 (-0.1)	-700 (-0.7)	0 (0.0)	-500 (-0.5)	300 (0.3)
Oct	---	---	100 (0.1)	-100 (-0.1)	-700 (-0.7)	100 (0.1)	-400 (-0.4)	400 (0.4)
Nov	---	---	100 (0.1)	-100 (-0.1)	-600 (-0.6)	0 (0.0)	-300 (-0.3)	300 (0.3)
Dec	---	---	-100 (-0.1)	-200 (-0.2)	-600 (-0.7)	-100 (-0.1)	-300 (-0.3)	200 (0.2)
Average	---	---	0 (0.0)	-300 (-0.3)	-1,100 (-1.3)	-100 (-0.1)	-500 (-0.6)	600 (0.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-12,000 (-13.6)	-12,200 (-13.8)	-12,300 (-13.9)	-12,700 (-14.4)	-12,100 (-13.7)	-12,400 (-14.0)	-11,500 (-13.0)
Feb	---	-13,400 (-16.7)	-13,500 (-16.8)	-13,800 (-17.2)	-14,500 (-18.0)	-13,500 (-16.8)	-13,800 (-17.2)	-12,400 (-15.4)
Mar	---	-13,100 (-16.9)	-13,200 (-17.1)	-13,600 (-17.6)	-14,600 (-18.9)	-13,300 (-17.2)	-13,700 (-17.7)	-11,800 (-15.2)
Apr	---	-13,900 (-18.5)	-13,900 (-18.5)	-14,300 (-19.0)	-15,600 (-20.8)	-14,000 (-18.6)	-14,500 (-19.3)	-12,500 (-16.6)
May	---	-14,700 (-18.9)	-14,700 (-18.9)	-15,200 (-19.5)	-16,500 (-21.2)	-14,900 (-19.2)	-15,400 (-19.8)	-13,300 (-17.1)
Jun	---	-8,500 (-8.5)	-8,500 (-8.5)	-9,000 (-9.0)	-10,200 (-10.2)	-8,600 (-8.6)	-9,100 (-9.1)	-7,600 (-7.6)
Jul	---	-2,200 (-1.9)	-2,100 (-1.9)	-2,500 (-2.2)	-3,200 (-2.8)	-2,200 (-1.9)	-2,800 (-2.5)	-2,200 (-1.9)
Aug	---	-700 (-0.6)	-600 (-0.5)	-900 (-0.8)	-1,500 (-1.4)	-700 (-0.6)	-1,200 (-1.1)	-600 (-0.5)
Sep	---	-1,000 (-0.9)	-900 (-0.8)	-1,100 (-1.0)	-1,700 (-1.6)	-1,000 (-0.9)	-1,500 (-1.4)	-700 (-0.7)
Oct	---	-1,700 (-1.6)	-1,600 (-1.5)	-1,800 (-1.7)	-2,400 (-2.3)	-1,600 (-1.5)	-2,100 (-2.0)	-1,300 (-1.2)
Nov	---	-3,800 (-3.7)	-3,700 (-3.6)	-3,900 (-3.8)	-4,400 (-4.3)	-3,800 (-3.7)	-4,100 (-4.0)	-3,500 (-3.4)
Dec	---	-7,900 (-8.1)	-8,000 (-8.2)	-8,100 (-8.4)	-8,500 (-8.8)	-8,000 (-8.2)	-8,200 (-8.5)	-7,700 (-7.9)
Average	---	-7,700 (-8.1)	-7,700 (-8.1)	-8,000 (-8.4)	-8,800 (-9.3)	-7,800 (-8.2)	-8,200 (-8.7)	-7,100 (-7.5)

Table 134. Monthly Storage Contents Normal Year (2005) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	49,000	46,100	46,200	46,200	46,400	46,400	44,900	45,600
Feb	44,300	45,800	46,000	46,100	46,000	46,300	44,700	45,400
Mar	39,600	45,300	45,500	45,600	45,500	45,700	44,200	44,900
Apr	35,500	44,100	44,300	44,400	44,300	44,600	43,000	43,700
May	37,400	46,300	46,600	46,900	46,600	46,900	45,200	45,900
Jun	66,500	75,500	76,000	76,300	75,700	76,300	74,700	75,300
Jul	90,300	97,800	98,400	98,800	98,000	98,800	97,100	97,800
Aug	84,400	92,000	92,300	92,400	92,000	92,500	91,900	92,100
Sep	80,600	90,500	91,100	91,300	90,400	91,300	90,300	90,500
Oct	85,400	92,600	93,100	93,200	92,800	93,200	92,400	92,600
Nov	83,800	90,000	91,000	90,900	90,500	90,900	90,300	90,200
Dec	75,400	75,400	75,900	76,000	75,600	76,000	75,700	75,100
Average	64,500	70,300	70,700	70,800	70,500	70,900	69,700	70,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (0.2)	100 (0.2)	300 (0.7)	300 (0.7)	-1,200 (-2.6)	-500 (-1.1)
Feb	---	---	200 (0.4)	300 (0.7)	200 (0.4)	500 (1.1)	-1,100 (-2.4)	-400 (-0.9)
Mar	---	---	200 (0.4)	300 (0.7)	200 (0.4)	400 (0.9)	-1,100 (-2.4)	-400 (-0.9)
Apr	---	---	200 (0.5)	300 (0.7)	200 (0.5)	500 (1.1)	-1,100 (-2.5)	-400 (-0.9)
May	---	---	300 (0.6)	600 (1.3)	300 (0.6)	600 (1.3)	-1,100 (-2.4)	-400 (-0.9)
Jun	---	---	500 (0.7)	800 (1.1)	200 (0.3)	800 (1.1)	-800 (-1.1)	-200 (-0.3)
Jul	---	---	600 (0.6)	1,000 (1.0)	200 (0.2)	1,000 (1.0)	-700 (-0.7)	0 (0.0)
Aug	---	---	300 (0.3)	400 (0.4)	0 (0.0)	500 (0.5)	-100 (-0.1)	100 (0.1)
Sep	---	---	600 (0.7)	800 (0.9)	-100 (-0.1)	800 (0.9)	-200 (-0.2)	0 (0.0)
Oct	---	---	500 (0.5)	600 (0.6)	200 (0.2)	600 (0.6)	-200 (-0.2)	0 (0.0)
Nov	---	---	1,000 (1.1)	900 (1.0)	500 (0.6)	900 (1.0)	300 (0.3)	200 (0.2)
Dec	---	---	500 (0.7)	600 (0.8)	200 (0.3)	600 (0.8)	300 (0.4)	-300 (-0.4)
Average	---	---	400 (0.6)	500 (0.7)	200 (0.3)	600 (0.9)	-600 (-0.9)	-200 (-0.3)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-2,900 (-5.9)	-2,800 (-5.7)	-2,800 (-5.7)	-2,600 (-5.3)	-2,600 (-5.3)	-4,100 (-8.4)	-3,400 (-6.9)
Feb	---	1,500 (3.4)	1,700 (3.8)	1,800 (4.1)	1,700 (3.8)	2,000 (4.5)	400 (0.9)	1,100 (2.5)
Mar	---	5,700 (14.4)	5,900 (14.9)	6,000 (15.2)	5,900 (14.9)	6,100 (15.4)	4,600 (11.6)	5,300 (13.4)
Apr	---	8,600 (24.2)	8,800 (24.8)	8,900 (25.1)	8,800 (24.8)	9,100 (25.6)	7,500 (21.1)	8,200 (23.1)
May	---	8,900 (23.8)	9,200 (24.6)	9,500 (25.4)	9,200 (24.6)	9,500 (25.4)	7,800 (20.9)	8,500 (22.7)
Jun	---	9,000 (13.5)	9,500 (14.3)	9,800 (14.7)	9,200 (13.8)	9,800 (14.7)	8,200 (12.3)	8,800 (13.2)
Jul	---	7,500 (8.3)	8,100 (9.0)	8,500 (9.4)	7,700 (8.5)	8,500 (9.4)	6,800 (7.5)	7,500 (8.3)
Aug	---	7,600 (9.0)	7,900 (9.4)	8,000 (9.5)	7,600 (9.0)	8,100 (9.6)	7,500 (8.9)	7,700 (9.1)
Sep	---	9,900 (12.3)	10,500 (13.0)	10,700 (13.3)	9,800 (12.2)	10,700 (13.3)	9,700 (12.0)	9,900 (12.3)
Oct	---	7,200 (8.4)	7,700 (9.0)	7,800 (9.1)	7,400 (8.7)	7,800 (9.1)	7,000 (8.2)	7,200 (8.4)
Nov	---	6,200 (7.4)	7,200 (8.6)	7,100 (8.5)	6,700 (8.0)	7,100 (8.5)	6,500 (7.8)	6,400 (7.6)
Dec	---	0 (0.0)	500 (0.7)	600 (0.8)	200 (0.3)	600 (0.8)	300 (0.4)	-300 (-0.4)
Average	---	5,800 (9.0)	6,200 (9.6)	6,300 (9.8)	6,000 (9.3)	6,400 (9.9)	5,200 (8.1)	5,600 (8.7)

Table 135. Monthly Storage Contents Wet Year (1997) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	101,100	79,500	79,100	79,000	79,100	79,000	79,900	79,800
Feb	98,100	63,700	64,000	64,300	64,500	64,200	65,300	65,700
Mar	101,000	62,300	62,800	62,800	63,300	62,800	63,800	64,200
Apr	97,500	58,600	59,400	59,300	59,800	59,400	60,300	60,900
May	98,600	67,300	66,600	66,500	68,400	66,800	67,500	68,100
Jun	124,900	110,000	109,700	109,300	110,500	109,600	110,100	110,300
Jul	128,800	125,700	125,300	125,000	125,400	125,200	125,400	125,300
Aug	123,500	124,100	123,800	123,500	123,800	123,700	123,900	123,800
Sep	118,700	120,800	120,600	120,200	120,400	120,400	120,600	120,600
Oct	118,500	120,400	120,200	119,900	120,000	120,100	120,300	120,200
Nov	116,200	116,900	116,800	116,400	116,600	116,600	116,800	116,800
Dec	110,100	107,900	107,800	107,400	107,500	107,600	107,800	107,700
Average	111,500	96,600	96,600	96,300	96,800	96,500	97,000	97,200
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-400 (-0.5)	-500 (-0.6)	-400 (-0.5)	-500 (-0.6)	400 (0.5)	300 (0.4)
Feb	---	---	300 (0.5)	600 (0.9)	800 (1.3)	500 (0.8)	1,600 (2.5)	2,000 (3.1)
Mar	---	---	500 (0.8)	500 (0.8)	1,000 (1.6)	500 (0.8)	1,500 (2.4)	1,900 (3.0)
Apr	---	---	800 (1.4)	700 (1.2)	1,200 (2.0)	800 (1.4)	1,700 (2.9)	2,300 (3.9)
May	---	---	-700 (-1.0)	-800 (-1.2)	1,100 (1.6)	-500 (-0.7)	200 (0.3)	800 (1.2)
Jun	---	---	-300 (-0.3)	-700 (-0.6)	500 (0.5)	-400 (-0.4)	100 (0.1)	300 (0.3)
Jul	---	---	-400 (-0.3)	-700 (-0.6)	-300 (-0.2)	-500 (-0.4)	-300 (-0.2)	-400 (-0.3)
Aug	---	---	-300 (-0.2)	-600 (-0.5)	-300 (-0.2)	-400 (-0.3)	-200 (-0.2)	-300 (-0.2)
Sep	---	---	-200 (-0.2)	-600 (-0.5)	-400 (-0.3)	-400 (-0.3)	-200 (-0.2)	-200 (-0.2)
Oct	---	---	-200 (-0.2)	-500 (-0.4)	-400 (-0.3)	-300 (-0.2)	-100 (-0.1)	-200 (-0.2)
Nov	---	---	-100 (-0.1)	-500 (-0.4)	-300 (-0.3)	-300 (-0.3)	-100 (-0.1)	-100 (-0.1)
Dec	---	---	-100 (-0.1)	-500 (-0.5)	-400 (-0.4)	-300 (-0.3)	-100 (-0.1)	-200 (-0.2)
Average	---	---	0 (0.0)	-300 (-0.3)	200 (0.2)	-100 (-0.1)	400 (0.4)	600 (0.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-21,600 (-21.4)	-22,000 (-21.8)	-22,100 (-21.9)	-22,000 (-21.8)	-22,100 (-21.9)	-21,200 (-21.0)	-21,300 (-21.1)
Feb	---	-34,400 (-35.1)	-34,100 (-34.8)	-33,800 (-34.5)	-33,600 (-34.3)	-33,900 (-34.6)	-32,800 (-33.4)	-32,400 (-33.0)
Mar	---	-38,700 (-38.3)	-38,200 (-37.8)	-38,200 (-37.8)	-37,700 (-37.3)	-38,200 (-37.8)	-37,200 (-36.8)	-36,800 (-36.4)
Apr	---	-38,900 (-39.9)	-38,100 (-39.1)	-38,200 (-39.2)	-37,700 (-38.7)	-38,100 (-39.1)	-37,200 (-38.2)	-36,600 (-37.5)
May	---	-31,300 (-31.7)	-32,000 (-32.5)	-32,100 (-32.6)	-30,200 (-30.6)	-31,800 (-32.3)	-31,100 (-31.5)	-30,500 (-30.9)
Jun	---	-14,900 (-11.9)	-15,200 (-12.2)	-15,600 (-12.5)	-14,400 (-11.5)	-15,300 (-12.2)	-14,800 (-11.8)	-14,600 (-11.7)
Jul	---	-3,100 (-2.4)	-3,500 (-2.7)	-3,800 (-3.0)	-3,400 (-2.6)	-3,600 (-2.8)	-3,400 (-2.6)	-3,500 (-2.7)
Aug	---	600 (0.5)	300 (0.2)	0 (0.0)	300 (0.2)	200 (0.2)	400 (0.3)	300 (0.2)
Sep	---	2,100 (1.8)	1,900 (1.6)	1,500 (1.3)	1,700 (1.4)	1,700 (1.4)	1,900 (1.6)	1,900 (1.6)
Oct	---	1,900 (1.6)	1,700 (1.4)	1,400 (1.2)	1,500 (1.3)	1,600 (1.4)	1,800 (1.5)	1,700 (1.4)
Nov	---	700 (0.6)	600 (0.5)	200 (0.2)	400 (0.3)	400 (0.3)	600 (0.5)	600 (0.5)
Dec	---	-2,200 (-2.0)	-2,300 (-2.1)	-2,700 (-2.5)	-2,600 (-2.4)	-2,500 (-2.3)	-2,300 (-2.1)	-2,400 (-2.2)
Average	---	-14,900 (-13.4)	-14,900 (-13.4)	-15,200 (-13.6)	-14,700 (-13.2)	-15,000 (-13.5)	-14,500 (-13.0)	-14,300 (-12.8)

Table 136. Monthly Storage Contents Dry Year (2004) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	51,700	57,600	56,900	57,000	58,100	56,900	55,800	56,400
Feb	46,800	56,400	55,700	55,800	56,900	55,700	54,500	55,200
Mar	42,600	55,400	54,700	54,800	55,900	54,700	53,500	54,200
Apr	39,300	54,800	54,200	54,200	55,300	54,200	53,000	53,600
May	46,800	60,300	59,600	59,600	60,600	59,700	57,700	59,100
Jun	65,800	76,100	75,100	75,000	76,300	75,200	73,400	75,000
Jul	64,000	78,700	77,700	77,700	79,000	77,900	76,000	77,600
Aug	54,100	70,400	69,300	69,200	70,500	69,300	67,600	69,100
Sep	49,600	66,000	65,100	65,000	66,300	65,200	63,500	65,000
Oct	49,800	68,900	68,100	68,100	69,100	68,300	66,600	67,900
Nov	52,000	64,600	63,400	63,500	64,700	63,600	62,700	63,700
Dec	51,500	52,500	51,000	51,000	52,300	51,100	50,900	51,700
Average	51,200	63,500	62,600	62,600	63,800	62,700	61,300	62,400
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-700 (-1.2)	-600 (-1.0)	500 (0.9)	-700 (-1.2)	-1,800 (-3.1)	-1,200 (-2.1)
Feb	---	---	-700 (-1.2)	-600 (-1.1)	500 (0.9)	-700 (-1.2)	-1,900 (-3.4)	-1,200 (-2.1)
Mar	---	---	-700 (-1.3)	-600 (-1.1)	500 (0.9)	-700 (-1.3)	-1,900 (-3.4)	-1,200 (-2.2)
Apr	---	---	-600 (-1.1)	-600 (-1.1)	500 (0.9)	-600 (-1.1)	-1,800 (-3.3)	-1,200 (-2.2)
May	---	---	-700 (-1.2)	-700 (-1.2)	300 (0.5)	-600 (-1.0)	-2,600 (-4.3)	-1,200 (-2.0)
Jun	---	---	-1,000 (-1.3)	-1,100 (-1.4)	200 (0.3)	-900 (-1.2)	-2,700 (-3.5)	-1,100 (-1.4)
Jul	---	---	-1,000 (-1.3)	-1,000 (-1.3)	300 (0.4)	-800 (-1.0)	-2,700 (-3.4)	-1,100 (-1.4)
Aug	---	---	-1,100 (-1.6)	-1,200 (-1.7)	100 (0.1)	-1,100 (-1.6)	-2,800 (-4.0)	-1,300 (-1.8)
Sep	---	---	-900 (-1.4)	-1,000 (-1.5)	300 (0.5)	-800 (-1.2)	-2,500 (-3.8)	-1,000 (-1.5)
Oct	---	---	-800 (-1.2)	-800 (-1.2)	200 (0.3)	-600 (-0.9)	-2,300 (-3.3)	-1,000 (-1.5)
Nov	---	---	-1,200 (-1.9)	-1,100 (-1.7)	100 (0.2)	-1,000 (-1.5)	-1,900 (-2.9)	-900 (-1.4)
Dec	---	---	-1,500 (-2.9)	-1,500 (-2.9)	-200 (-0.4)	-1,400 (-2.7)	-1,600 (-3.0)	-800 (-1.5)
Average	---	---	-900 (-1.4)	-900 (-1.4)	300 (0.5)	-800 (-1.3)	-2,200 (-3.5)	-1,100 (-1.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	5,900 (11.4)	5,200 (10.1)	5,300 (10.3)	6,400 (12.4)	5,200 (10.1)	4,100 (7.9)	4,700 (9.1)
Feb	---	9,600 (20.5)	8,900 (19.0)	9,000 (19.2)	10,100 (21.6)	8,900 (19.0)	7,700 (16.5)	8,400 (17.9)
Mar	---	12,800 (30.0)	12,100 (28.4)	12,200 (28.6)	13,300 (31.2)	12,100 (28.4)	10,900 (25.6)	11,600 (27.2)
Apr	---	15,500 (39.4)	14,900 (37.9)	14,900 (37.9)	16,000 (40.7)	14,900 (37.9)	13,700 (34.9)	14,300 (36.4)
May	---	13,500 (28.8)	12,800 (27.4)	12,800 (27.4)	13,800 (29.5)	12,900 (27.6)	10,900 (23.3)	12,300 (26.3)
Jun	---	10,300 (15.7)	9,300 (14.1)	9,200 (14.0)	10,500 (16.0)	9,400 (14.3)	7,600 (11.6)	9,200 (14.0)
Jul	---	14,700 (23.0)	13,700 (21.4)	13,700 (21.4)	15,000 (23.4)	13,900 (21.7)	12,000 (18.8)	13,600 (21.3)
Aug	---	16,300 (30.1)	15,200 (28.1)	15,100 (27.9)	16,400 (30.3)	15,200 (28.1)	13,500 (25.0)	15,000 (27.7)
Sep	---	16,400 (33.1)	15,500 (31.3)	15,400 (31.0)	16,700 (33.7)	15,600 (31.5)	13,900 (28.0)	15,400 (31.0)
Oct	---	19,100 (38.4)	18,300 (36.7)	18,300 (36.7)	19,300 (38.8)	18,500 (37.1)	16,800 (33.7)	18,100 (36.3)
Nov	---	12,600 (24.2)	11,400 (21.9)	11,500 (22.1)	12,700 (24.4)	11,600 (22.3)	10,700 (20.6)	11,700 (22.5)
Dec	---	1,000 (1.9)	-500 (-1.0)	-500 (-1.0)	800 (1.6)	-400 (-0.8)	-600 (-1.2)	200 (0.4)
Average	---	12,300 (24.0)	11,400 (22.3)	11,400 (22.3)	12,600 (24.6)	11,500 (22.5)	10,100 (19.7)	11,200 (21.9)

A time-series plot of simulated storage contents for each of the alternatives is shown in Figure 28. All alternatives follow the same general pattern of annual drawdown's and annual filling.

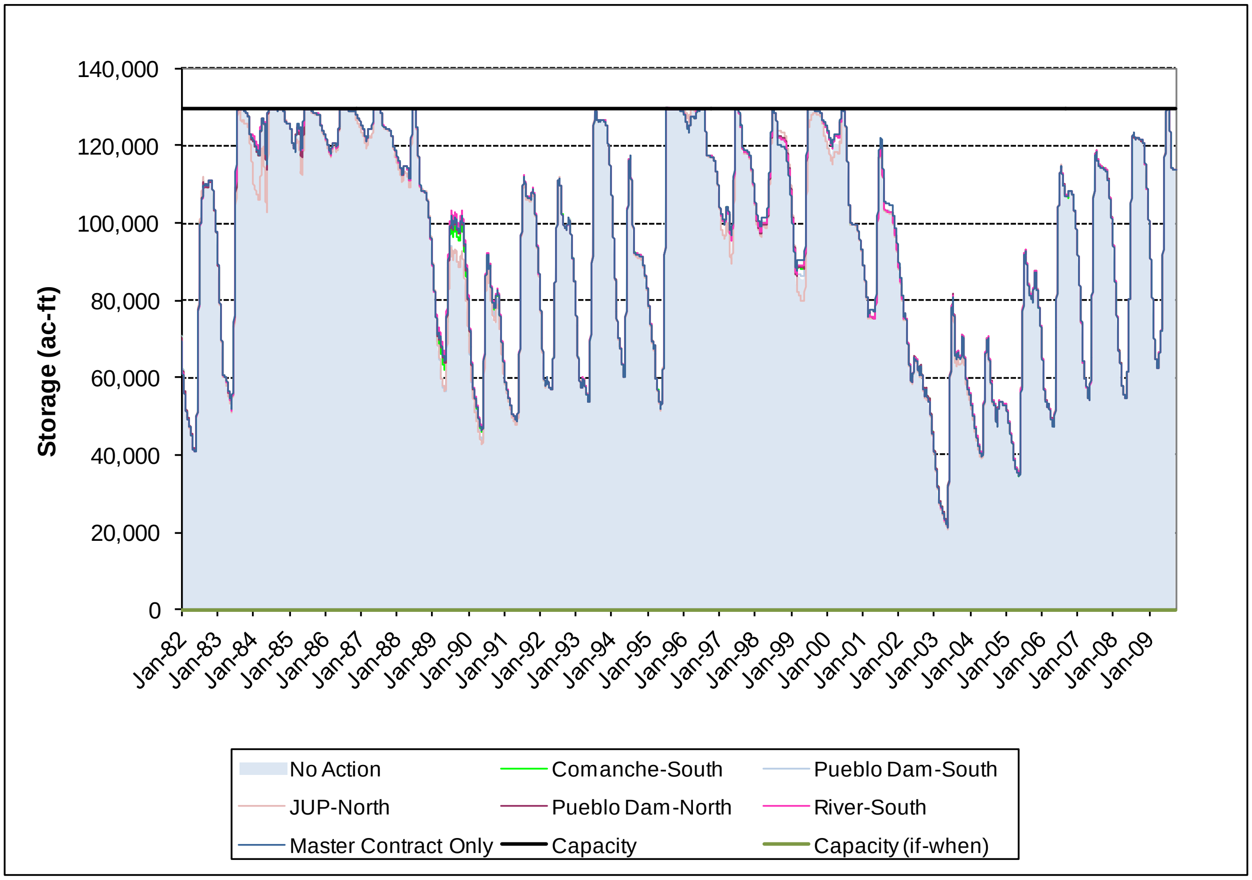

Figure 28. Storage Time Series Analysis – Turquoise Reservoir (Direct Effects).

A time-series plot of simulated storage contents for the Turquoise Reservoir cumulative effects analysis is shown in Figure 29.

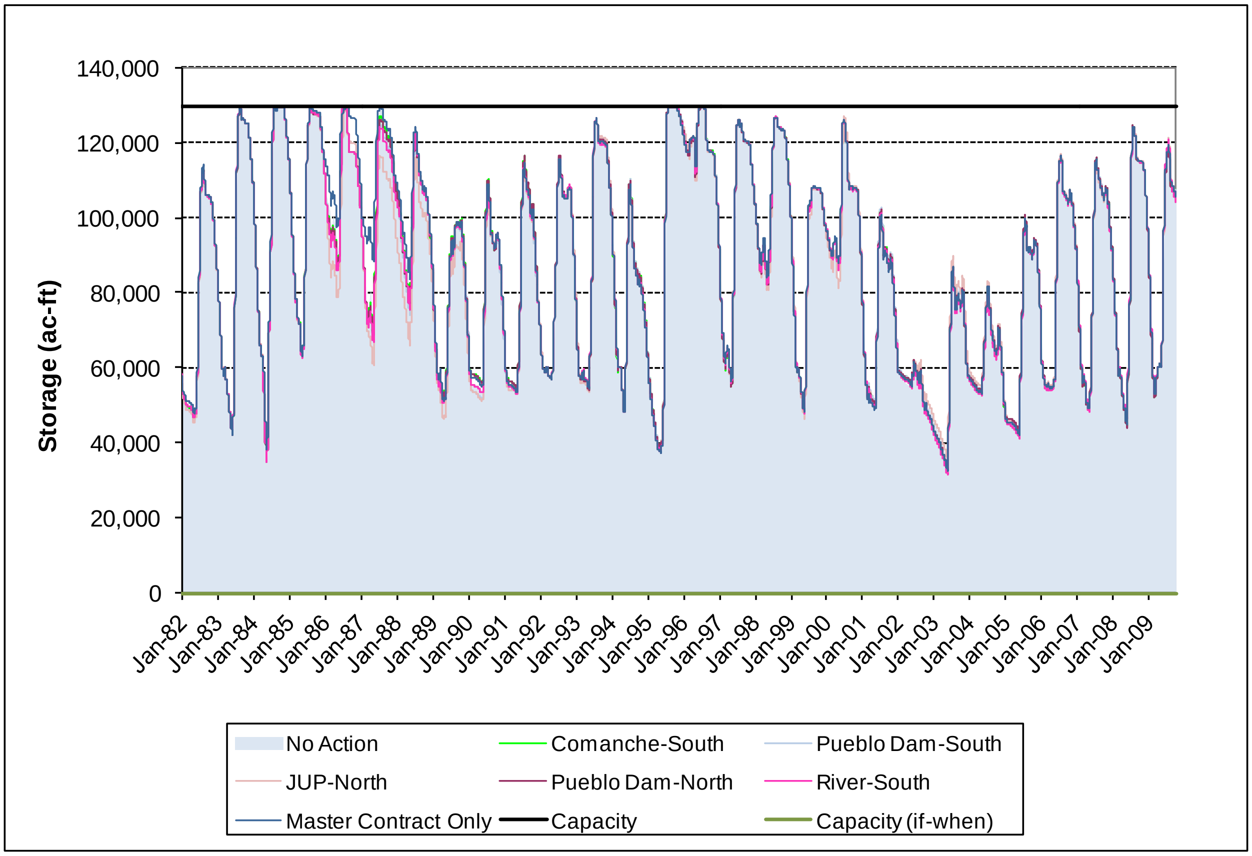

Figure 29. Storage Time Series Analysis – Turquoise Reservoir (Cumulative Effects).

Simulated water surface elevation for Turquoise Reservoir is presented in Table 137 through Table 140 for the direct effects analysis, and Table 141 through Table 144 for the cumulative effects analysis. Simulated surface area for Turquoise Reservoir is presented in Table 145 through Table 148 for the direct effects analysis, and Table 149 through Table 152 for the cumulative effects analysis.

Table 137. Monthly Water Surface Elevation Overall Average – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,844.4	9,844.2	9,844.6	9,844.4	9,843.9	9,844.6	9,844.6	9,844.6
Feb	9,839.1	9,838.9	9,839.2	9,839.1	9,838.5	9,839.3	9,839.3	9,839.3
Mar	9,836.8	9,836.6	9,837.1	9,836.9	9,836.1	9,837.2	9,837.2	9,837.3
Apr	9,835.0	9,834.8	9,835.3	9,835.1	9,834.2	9,835.4	9,835.5	9,835.6
May	9,836.9	9,836.7	9,837.2	9,836.9	9,836.0	9,837.2	9,837.4	9,837.4
Jun	9,851.8	9,851.5	9,851.8	9,851.6	9,851.3	9,851.9	9,852.0	9,852.0
Jul	9,859.9	9,859.5	9,859.8	9,859.6	9,859.4	9,859.9	9,859.9	9,859.9
Aug	9,857.3	9,857.1	9,857.4	9,857.2	9,857.0	9,857.4	9,857.5	9,857.4
Sep	9,855.9	9,855.6	9,855.9	9,855.7	9,855.5	9,856.0	9,856.0	9,855.9
Oct	9,855.5	9,855.2	9,855.6	9,855.4	9,855.2	9,855.7	9,855.7	9,855.6
Nov	9,853.9	9,853.6	9,854.0	9,853.8	9,853.5	9,854.0	9,854.0	9,854.0
Dec	9,849.9	9,849.6	9,850.1	9,849.9	9,849.4	9,850.1	9,850.1	9,850.0
Average	9,848.0	9,847.8	9,848.2	9,848.0	9,847.5	9,848.2	9,848.3	9,848.2
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.4 (0.4)	0.2 (0.2)	-0.3 (-0.3)	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)
Feb	---	---	0.3 (0.3)	0.2 (0.2)	-0.4 (-0.4)	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)
Mar	---	---	0.5 (0.6)	0.3 (0.3)	-0.5 (-0.6)	0.6 (0.7)	0.6 (0.7)	0.7 (0.8)
Apr	---	---	0.5 (0.6)	0.3 (0.4)	-0.6 (-0.7)	0.6 (0.7)	0.7 (0.8)	0.8 (0.9)
May	---	---	0.4 (0.5)	0.2 (0.2)	-0.7 (-0.8)	0.5 (0.6)	0.7 (0.8)	0.7 (0.8)
Jun	---	---	0.3 (0.3)	0.1 (0.1)	-0.2 (-0.2)	0.4 (0.4)	0.4 (0.4)	0.5 (0.5)
Jul	---	---	0.3 (0.3)	0.1 (0.1)	-0.1 (-0.1)	0.3 (0.3)	0.4 (0.4)	0.4 (0.4)
Aug	---	---	0.3 (0.3)	0.1 (0.1)	-0.1 (-0.1)	0.3 (0.3)	0.4 (0.4)	0.3 (0.3)
Sep	---	---	0.3 (0.3)	0.1 (0.1)	-0.1 (-0.1)	0.4 (0.4)	0.4 (0.4)	0.3 (0.3)
Oct	---	---	0.4 (0.4)	0.2 (0.2)	0.0 (0.0)	0.5 (0.5)	0.5 (0.5)	0.4 (0.4)
Nov	---	---	0.4 (0.4)	0.2 (0.2)	-0.1 (-0.1)	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)
Dec	---	---	0.4 (0.4)	0.3 (0.3)	-0.2 (-0.2)	0.5 (0.5)	0.5 (0.5)	0.4 (0.4)
Average	---	---	0.4 (0.4)	0.2 (0.2)	-0.3 (-0.3)	0.4 (0.5)	0.5 (0.5)	0.5 (0.5)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.2 (-0.2)	0.2 (0.2)	0.0 (0.0)	-0.5 (-0.5)	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)
Feb	---	-0.1 (-0.1)	0.2 (0.2)	0.1 (0.1)	-0.5 (-0.6)	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)
Mar	---	-0.2 (-0.2)	0.3 (0.3)	0.1 (0.1)	-0.7 (-0.8)	0.4 (0.5)	0.4 (0.5)	0.5 (0.6)
Apr	---	-0.2 (-0.2)	0.3 (0.4)	0.1 (0.1)	-0.8 (-0.9)	0.4 (0.5)	0.5 (0.6)	0.6 (0.7)
May	---	-0.2 (-0.2)	0.2 (0.2)	0.0 (0.0)	-0.9 (-1.0)	0.3 (0.3)	0.5 (0.6)	0.5 (0.6)
Jun	---	-0.3 (-0.3)	0.0 (0.0)	-0.2 (-0.2)	-0.5 (-0.5)	0.1 (0.1)	0.1 (0.1)	0.2 (0.2)
Jul	---	-0.4 (-0.4)	-0.1 (-0.1)	-0.3 (-0.3)	-0.5 (-0.5)	-0.1 (-0.1)	0.0 (0.0)	0.0 (0.0)
Aug	---	-0.2 (-0.2)	0.1 (0.1)	-0.1 (-0.1)	-0.3 (-0.3)	0.1 (0.1)	0.2 (0.2)	0.1 (0.1)
Sep	---	-0.2 (-0.2)	0.1 (0.1)	-0.1 (-0.1)	-0.3 (-0.3)	0.2 (0.2)	0.2 (0.2)	0.1 (0.1)
Oct	---	-0.3 (-0.3)	0.1 (0.1)	-0.1 (-0.1)	-0.3 (-0.3)	0.2 (0.2)	0.2 (0.2)	0.1 (0.1)
Nov	---	-0.3 (-0.3)	0.1 (0.1)	-0.1 (-0.1)	-0.4 (-0.4)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Dec	---	-0.3 (-0.3)	0.1 (0.1)	0.0 (0.0)	-0.5 (-0.5)	0.2 (0.2)	0.2 (0.2)	0.1 (0.1)
Average	---	-0.2 (-0.2)	0.1 (0.1)	0.0 (-0.1)	-0.5 (-0.5)	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 138. Monthly Water Surface Elevation Normal Year (2005) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,817.9	9,819.5	9,819.3	9,819.4	9,819.2	9,819.5	9,819.4	9,819.1
Feb	9,814.1	9,815.7	9,815.5	9,815.6	9,815.4	9,815.7	9,815.6	9,815.3
Mar	9,810.1	9,811.5	9,811.2	9,811.3	9,811.3	9,811.3	9,811.3	9,810.9
Apr	9,806.4	9,807.9	9,807.3	9,807.5	9,807.7	9,807.5	9,807.5	9,807.1
May	9,808.0	9,809.8	9,809.0	9,809.2	9,809.6	9,809.2	9,809.3	9,808.8
Jun	9,830.7	9,831.9	9,831.3	9,831.4	9,831.7	9,831.4	9,831.5	9,831.1
Jul	9,846.4	9,847.2	9,846.8	9,846.9	9,847.1	9,846.9	9,847.0	9,846.6
Aug	9,842.8	9,843.5	9,843.1	9,843.1	9,843.3	9,843.2	9,843.2	9,842.9
Sep	9,840.3	9,841.1	9,840.6	9,840.7	9,840.9	9,840.8	9,840.8	9,840.5
Oct	9,843.4	9,843.2	9,842.8	9,842.8	9,843.0	9,842.9	9,842.9	9,842.7
Nov	9,842.4	9,842.1	9,841.8	9,841.8	9,841.9	9,841.9	9,841.9	9,841.7
Dec	9,836.9	9,836.7	9,836.4	9,836.4	9,836.6	9,836.5	9,836.5	9,836.3
Average	9,828.3	9,829.2	9,828.8	9,828.8	9,829.0	9,828.9	9,828.9	9,828.6
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.2 (-0.2)	0.0 (-0.1)	-0.3 (-0.4)	0.0 (0.0)	0.0 (-0.1)	-0.3 (-0.5)
Feb	---	---	-0.2 (-0.3)	-0.1 (-0.1)	-0.3 (-0.4)	0.0 (0.0)	0.0 (-0.1)	-0.4 (-0.6)
Mar	---	---	-0.4 (-0.6)	-0.2 (-0.3)	-0.2 (-0.4)	-0.2 (-0.3)	-0.2 (-0.3)	-0.6 (-0.9)
Apr	---	---	-0.6 (-1.0)	-0.4 (-0.7)	-0.2 (-0.4)	-0.4 (-0.7)	-0.4 (-0.7)	-0.8 (-1.4)
May	---	---	-0.8 (-1.3)	-0.6 (-1.1)	-0.2 (-0.4)	-0.6 (-1.1)	-0.6 (-0.9)	-1.0 (-1.7)
Jun	---	---	-0.6 (-0.7)	-0.5 (-0.6)	-0.1 (-0.2)	-0.4 (-0.5)	-0.4 (-0.5)	-0.8 (-0.9)
Jul	---	---	-0.4 (-0.4)	-0.3 (-0.3)	-0.1 (-0.1)	-0.3 (-0.3)	-0.2 (-0.2)	-0.5 (-0.6)
Aug	---	---	-0.4 (-0.4)	-0.4 (-0.4)	-0.2 (-0.2)	-0.3 (-0.3)	-0.3 (-0.3)	-0.6 (-0.6)
Sep	---	---	-0.4 (-0.5)	-0.4 (-0.4)	-0.2 (-0.2)	-0.3 (-0.3)	-0.3 (-0.3)	-0.6 (-0.7)
Oct	---	---	-0.4 (-0.4)	-0.4 (-0.4)	-0.2 (-0.2)	-0.3 (-0.3)	-0.3 (-0.3)	-0.5 (-0.5)
Nov	---	---	-0.3 (-0.4)	-0.3 (-0.4)	-0.2 (-0.2)	-0.3 (-0.3)	-0.3 (-0.3)	-0.5 (-0.5)
Dec	---	---	-0.3 (-0.3)	-0.3 (-0.3)	-0.1 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)	-0.4 (-0.4)
Average	---	---	-0.4 (-0.5)	-0.3 (-0.4)	-0.2 (-0.3)	-0.3 (-0.3)	-0.3 (-0.3)	-0.6 (-0.7)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	1.6 (2.3)	1.4 (2.1)	1.5 (2.2)	1.3 (1.9)	1.6 (2.3)	1.5 (2.3)	1.2 (1.8)
Feb	---	1.6 (2.5)	1.4 (2.2)	1.6 (2.4)	1.3 (2.1)	1.6 (2.5)	1.6 (2.4)	1.2 (1.9)
Mar	---	1.4 (2.3)	1.1 (1.8)	1.2 (2.0)	1.2 (1.9)	1.2 (2.0)	1.2 (2.0)	0.9 (1.4)
Apr	---	1.5 (2.7)	1.0 (1.7)	1.1 (2.0)	1.3 (2.3)	1.1 (2.0)	1.1 (2.0)	0.7 (1.2)
May	---	1.8 (3.2)	1.0 (1.8)	1.2 (2.0)	1.6 (2.8)	1.2 (2.1)	1.3 (2.2)	0.8 (1.4)
Jun	---	1.2 (1.5)	0.6 (0.7)	0.7 (0.9)	1.0 (1.3)	0.7 (0.9)	0.8 (1.0)	0.4 (0.5)
Jul	---	0.8 (0.8)	0.4 (0.4)	0.4 (0.5)	0.6 (0.7)	0.5 (0.5)	0.5 (0.5)	0.2 (0.2)
Aug	---	0.7 (0.8)	0.3 (0.4)	0.4 (0.4)	0.5 (0.6)	0.5 (0.5)	0.5 (0.5)	0.2 (0.2)
Sep	---	0.7 (0.8)	0.3 (0.3)	0.3 (0.4)	0.5 (0.6)	0.4 (0.5)	0.4 (0.5)	0.1 (0.1)
Oct	---	-0.2 (-0.2)	-0.5 (-0.5)	-0.5 (-0.5)	-0.4 (-0.4)	-0.4 (-0.5)	-0.4 (-0.4)	-0.6 (-0.7)
Nov	---	-0.2 (-0.2)	-0.6 (-0.6)	-0.6 (-0.6)	-0.4 (-0.5)	-0.5 (-0.5)	-0.5 (-0.5)	-0.7 (-0.7)
Dec	---	-0.2 (-0.3)	-0.5 (-0.6)	-0.5 (-0.6)	-0.4 (-0.4)	-0.4 (-0.5)	-0.4 (-0.5)	-0.6 (-0.7)
Average	---	0.9 (1.1)	0.5 (0.6)	0.6 (0.7)	0.7 (0.9)	0.6 (0.8)	0.6 (0.8)	0.3 (0.4)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 139. Monthly Water Surface Elevation Wet Year (1997) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,853.0	9,853.1	9,854.1	9,854.1	9,852.8	9,854.1	9,854.2	9,854.3
Feb	9,851.2	9,851.2	9,852.6	9,852.6	9,850.4	9,852.7	9,852.7	9,852.8
Mar	9,853.0	9,852.7	9,854.2	9,854.2	9,851.8	9,854.2	9,854.2	9,854.4
Apr	9,850.9	9,850.5	9,852.6	9,852.6	9,849.1	9,852.6	9,852.5	9,853.1
May	9,851.5	9,851.0	9,853.5	9,853.4	9,849.5	9,853.5	9,853.4	9,854.0
Jun	9,866.8	9,866.5	9,867.6	9,867.6	9,865.8	9,867.6	9,867.6	9,867.8
Jul	9,869.1	9,869.1	9,869.1	9,869.1	9,869.1	9,869.1	9,869.1	9,869.2
Aug	9,866.1	9,865.9	9,866.0	9,866.0	9,865.9	9,866.0	9,866.0	9,866.3
Sep	9,863.3	9,863.1	9,863.2	9,863.2	9,863.0	9,863.2	9,863.2	9,863.4
Oct	9,863.2	9,862.9	9,863.0	9,863.0	9,862.9	9,863.0	9,863.0	9,863.3
Nov	9,861.9	9,861.6	9,861.7	9,861.7	9,861.5	9,861.7	9,861.7	9,862.0
Dec	9,858.3	9,858.0	9,858.2	9,858.2	9,857.9	9,858.2	9,858.2	9,858.4
Average	9,859.0	9,858.8	9,859.7	9,859.6	9,858.3	9,859.7	9,859.6	9,859.9
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	1.0 (1.0)	1.0 (1.0)	-0.3 (-0.3)	1.0 (1.0)	1.1 (1.1)	1.1 (1.1)
Feb	---	---	1.5 (1.5)	1.5 (1.5)	-0.7 (-0.7)	1.5 (1.5)	1.6 (1.6)	1.7 (1.7)
Mar	---	---	1.5 (1.5)	1.5 (1.5)	-0.9 (-0.9)	1.5 (1.5)	1.5 (1.5)	1.7 (1.7)
Apr	---	---	2.1 (2.1)	2.0 (2.0)	-1.4 (-1.4)	2.1 (2.1)	2.0 (2.0)	2.6 (2.6)
May	---	---	2.5 (2.5)	2.4 (2.4)	-1.5 (-1.5)	2.5 (2.5)	2.4 (2.4)	3.0 (3.0)
Jun	---	---	1.1 (0.9)	1.1 (0.9)	-0.7 (-0.6)	1.1 (0.9)	1.1 (0.9)	1.3 (1.1)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)
Aug	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.4 (0.3)
Sep	---	---	0.2 (0.2)	0.2 (0.2)	0.0 (0.0)	0.2 (0.2)	0.2 (0.2)	0.4 (0.4)
Oct	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.4 (0.4)
Nov	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.4 (0.4)
Dec	---	---	0.2 (0.2)	0.2 (0.2)	-0.1 (-0.1)	0.2 (0.2)	0.2 (0.2)	0.4 (0.4)
Average	---	---	0.9 (0.8)	0.9 (0.8)	-0.5 (-0.4)	0.9 (0.8)	0.9 (0.8)	1.1 (1.0)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.1 (0.1)	1.1 (1.1)	1.1 (1.1)	-0.2 (-0.2)	1.1 (1.1)	1.2 (1.2)	1.2 (1.2)
Feb	---	-0.1 (-0.1)	1.4 (1.4)	1.4 (1.4)	-0.8 (-0.8)	1.4 (1.4)	1.5 (1.5)	1.6 (1.6)
Mar	---	-0.3 (-0.3)	1.2 (1.2)	1.2 (1.2)	-1.2 (-1.2)	1.2 (1.2)	1.2 (1.2)	1.4 (1.4)
Apr	---	-0.4 (-0.4)	1.7 (1.7)	1.6 (1.6)	-1.8 (-1.8)	1.7 (1.7)	1.6 (1.6)	2.2 (2.2)
May	---	-0.5 (-0.5)	2.0 (2.0)	1.9 (1.9)	-2.0 (-2.0)	2.0 (2.0)	1.9 (1.9)	2.5 (2.5)
Jun	---	-0.3 (-0.3)	0.8 (0.7)	0.8 (0.7)	-1.0 (-0.9)	0.8 (0.7)	0.8 (0.7)	1.0 (0.9)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)
Aug	---	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)	0.2 (0.2)
Sep	---	-0.3 (-0.3)	-0.1 (-0.1)	-0.1 (-0.1)	-0.3 (-0.3)	-0.1 (-0.1)	-0.1 (-0.1)	0.1 (0.1)
Oct	---	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	0.1 (0.1)
Nov	---	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.4 (-0.4)	-0.2 (-0.2)	-0.2 (-0.2)	0.1 (0.1)
Dec	---	-0.3 (-0.3)	-0.1 (-0.1)	-0.1 (-0.1)	-0.4 (-0.4)	-0.1 (-0.1)	-0.1 (-0.1)	0.1 (0.1)
Average	---	-0.2 (-0.2)	0.6 (0.6)	0.6 (0.6)	-0.7 (-0.7)	0.6 (0.6)	0.6 (0.6)	0.9 (0.8)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 140. Monthly Water Surface Elevation Dry Year (2004) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,820.0	9,820.5	9,821.3	9,821.4	9,820.2	9,821.4	9,821.4	9,821.1
Feb	9,816.2	9,816.7	9,817.5	9,817.6	9,816.4	9,817.6	9,817.6	9,817.2
Mar	9,812.6	9,813.3	9,814.0	9,814.1	9,813.0	9,814.1	9,814.2	9,813.8
Apr	9,809.8	9,810.7	9,811.3	9,811.4	9,810.4	9,811.4	9,811.4	9,811.0
May	9,816.0	9,816.7	9,817.1	9,817.3	9,816.4	9,817.2	9,817.2	9,816.9
Jun	9,830.4	9,830.8	9,831.2	9,831.4	9,830.6	9,831.4	9,831.3	9,831.0
Jul	9,829.1	9,829.9	9,830.2	9,830.3	9,829.6	9,830.3	9,830.3	9,830.0
Aug	9,821.8	9,822.6	9,822.9	9,823.0	9,822.4	9,823.0	9,822.9	9,822.6
Sep	9,818.3	9,819.7	9,819.7	9,819.8	9,819.5	9,819.8	9,819.8	9,819.5
Oct	9,818.5	9,820.0	9,819.9	9,820.0	9,819.8	9,820.0	9,820.0	9,819.7
Nov	9,820.2	9,821.7	9,821.6	9,821.7	9,821.5	9,821.7	9,821.7	9,821.4
Dec	9,819.8	9,821.4	9,821.2	9,821.3	9,821.1	9,821.4	9,821.3	9,821.0
Average	9,819.4	9,820.3	9,820.6	9,820.8	9,820.1	9,820.8	9,820.8	9,820.4
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.8 (1.1)	0.9 (1.3)	-0.3 (-0.4)	0.9 (1.3)	0.9 (1.3)	0.6 (0.9)
Feb	---	---	0.9 (1.4)	1.0 (1.5)	-0.2 (-0.3)	1.0 (1.5)	1.0 (1.5)	0.6 (0.9)
Mar	---	---	0.7 (1.1)	0.8 (1.3)	-0.3 (-0.5)	0.8 (1.3)	0.9 (1.4)	0.5 (0.8)
Apr	---	---	0.6 (1.0)	0.7 (1.2)	-0.3 (-0.5)	0.7 (1.2)	0.7 (1.2)	0.3 (0.5)
May	---	---	0.4 (0.6)	0.6 (0.9)	-0.3 (-0.4)	0.5 (0.7)	0.5 (0.7)	0.2 (0.3)
Jun	---	---	0.4 (0.5)	0.5 (0.6)	-0.2 (-0.2)	0.5 (0.6)	0.5 (0.6)	0.2 (0.2)
Jul	---	---	0.3 (0.4)	0.4 (0.5)	-0.3 (-0.4)	0.4 (0.5)	0.3 (0.4)	0.0 (0.0)
Aug	---	---	0.3 (0.4)	0.4 (0.6)	-0.2 (-0.3)	0.4 (0.6)	0.3 (0.4)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.4)	0.1 (0.1)	0.1 (0.1)	-0.2 (-0.3)
Oct	---	---	-0.1 (-0.1)	0.0 (0.0)	-0.2 (-0.3)	0.0 (0.0)	0.0 (0.0)	-0.3 (-0.4)
Nov	---	---	-0.1 (-0.1)	0.0 (0.0)	-0.2 (-0.3)	0.0 (0.0)	0.0 (0.0)	-0.3 (-0.4)
Dec	---	---	-0.2 (-0.3)	-0.1 (-0.1)	-0.3 (-0.4)	0.0 (0.0)	-0.1 (-0.1)	-0.4 (-0.6)
Average	---	---	0.3 (0.5)	0.4 (0.6)	-0.3 (-0.4)	0.4 (0.6)	0.4 (0.6)	0.1 (0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.5 (0.7)	1.3 (1.9)	1.4 (2.0)	0.2 (0.3)	1.4 (2.0)	1.4 (2.0)	1.1 (1.6)
Feb	---	0.5 (0.8)	1.4 (2.1)	1.5 (2.3)	0.3 (0.5)	1.5 (2.3)	1.5 (2.3)	1.1 (1.7)
Mar	---	0.7 (1.1)	1.4 (2.2)	1.5 (2.4)	0.4 (0.6)	1.5 (2.4)	1.6 (2.6)	1.2 (1.9)
Apr	---	0.9 (1.5)	1.5 (2.5)	1.6 (2.7)	0.6 (1.0)	1.6 (2.7)	1.6 (2.7)	1.2 (2.0)
May	---	0.7 (1.1)	1.1 (1.7)	1.3 (2.0)	0.4 (0.6)	1.2 (1.8)	1.2 (1.8)	0.9 (1.4)
Jun	---	0.4 (0.5)	0.8 (1.0)	0.9 (1.1)	0.2 (0.2)	0.9 (1.1)	0.9 (1.1)	0.6 (0.7)
Jul	---	0.8 (1.0)	1.1 (1.4)	1.2 (1.5)	0.5 (0.6)	1.2 (1.5)	1.1 (1.4)	0.8 (1.0)
Aug	---	0.8 (1.1)	1.1 (1.5)	1.2 (1.7)	0.6 (0.8)	1.2 (1.7)	1.1 (1.5)	0.8 (1.1)
Sep	---	1.4 (2.0)	1.4 (2.0)	1.5 (2.2)	1.1 (1.6)	1.5 (2.2)	1.5 (2.2)	1.2 (1.8)
Oct	---	1.5 (2.2)	1.4 (2.0)	1.5 (2.2)	1.3 (1.9)	1.5 (2.2)	1.5 (2.2)	1.2 (1.8)
Nov	---	1.5 (2.1)	1.4 (2.0)	1.5 (2.1)	1.3 (1.9)	1.5 (2.1)	1.5 (2.1)	1.2 (1.7)
Dec	---	1.6 (2.3)	1.4 (2.0)	1.5 (2.1)	1.3 (1.9)	1.6 (2.3)	1.5 (2.1)	1.2 (1.7)
Average	---	0.9 (1.4)	1.3 (1.8)	1.4 (2.0)	0.7 (1.0)	1.4 (2.0)	1.4 (2.0)	1.0 (1.5)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 141. Monthly Water Surface Elevation Overall Average – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,844.4	9,836.9	9,836.8	9,836.7	9,836.5	9,836.8	9,836.6	9,837.2
Feb	9,839.1	9,830.6	9,830.5	9,830.3	9,829.9	9,830.5	9,830.3	9,831.2
Mar	9,836.8	9,828.7	9,828.6	9,828.3	9,827.7	9,828.6	9,828.3	9,829.5
Apr	9,835.0	9,826.4	9,826.5	9,826.1	9,825.3	9,826.3	9,826.0	9,827.3
May	9,836.9	9,827.7	9,827.7	9,827.3	9,826.5	9,827.6	9,827.2	9,828.5
Jun	9,851.8	9,846.8	9,846.8	9,846.5	9,845.8	9,846.7	9,846.4	9,847.3
Jul	9,859.9	9,858.7	9,858.7	9,858.5	9,858.1	9,858.7	9,858.3	9,858.7
Aug	9,857.3	9,857.1	9,857.1	9,856.9	9,856.6	9,857.0	9,856.7	9,857.1
Sep	9,855.9	9,855.4	9,855.5	9,855.4	9,855.0	9,855.4	9,855.1	9,855.6
Oct	9,855.5	9,854.7	9,854.7	9,854.6	9,854.2	9,854.7	9,854.4	9,854.9
Nov	9,853.9	9,851.8	9,851.8	9,851.6	9,851.4	9,851.8	9,851.5	9,851.9
Dec	9,849.9	9,845.1	9,845.0	9,845.0	9,844.8	9,845.0	9,844.9	9,845.2
Average	9,848.0	9,843.3	9,843.3	9,843.1	9,842.6	9,843.3	9,843.0	9,843.7
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.1 (-0.1)	-0.2 (-0.2)	-0.4 (-0.5)	-0.1 (-0.1)	-0.3 (-0.3)	0.3 (0.3)
Feb	---	---	-0.1 (-0.1)	-0.3 (-0.4)	-0.7 (-0.9)	-0.1 (-0.1)	-0.3 (-0.4)	0.6 (0.7)
Mar	---	---	-0.1 (-0.1)	-0.4 (-0.5)	-1.0 (-1.3)	-0.1 (-0.1)	-0.4 (-0.5)	0.8 (1.0)
Apr	---	---	0.0 (0.0)	-0.3 (-0.4)	-1.1 (-1.4)	-0.1 (-0.1)	-0.4 (-0.5)	0.9 (1.2)
May	---	---	0.0 (0.0)	-0.4 (-0.5)	-1.2 (-1.5)	-0.1 (-0.1)	-0.5 (-0.6)	0.8 (1.0)
Jun	---	---	0.0 (0.0)	-0.3 (-0.3)	-1.0 (-1.0)	-0.1 (-0.1)	-0.4 (-0.4)	0.5 (0.5)
Jul	---	---	0.0 (0.0)	-0.2 (-0.2)	-0.6 (-0.6)	0.0 (0.0)	-0.4 (-0.4)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	-0.2 (-0.2)	-0.5 (-0.5)	-0.1 (-0.1)	-0.4 (-0.4)	0.0 (0.0)
Sep	---	---	0.1 (0.1)	0.0 (0.0)	-0.4 (-0.4)	0.0 (0.0)	-0.3 (-0.3)	0.2 (0.2)
Oct	---	---	0.1 (0.1)	0.0 (0.0)	-0.4 (-0.4)	0.1 (0.1)	-0.3 (-0.3)	0.2 (0.2)
Nov	---	---	0.0 (0.0)	-0.2 (-0.2)	-0.4 (-0.4)	-0.1 (-0.1)	-0.3 (-0.3)	0.1 (0.1)
Dec	---	---	-0.1 (-0.1)	-0.1 (-0.1)	-0.3 (-0.3)	-0.1 (-0.1)	-0.2 (-0.2)	0.1 (0.1)
Average	---	---	0.0 (0.0)	-0.2 (-0.2)	-0.7 (-0.7)	-0.1 (-0.1)	-0.4 (-0.4)	0.4 (0.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-7.5 (-7.9)	-7.6 (-8.1)	-7.7 (-8.2)	-7.9 (-8.4)	-7.6 (-8.1)	-7.8 (-8.3)	-7.2 (-7.6)
Feb	---	-8.4 (-9.4)	-8.5 (-9.6)	-8.7 (-9.8)	-9.1 (-10.2)	-8.5 (-9.6)	-8.7 (-9.8)	-7.8 (-8.8)
Mar	---	-8.1 (-9.3)	-8.2 (-9.4)	-8.5 (-9.8)	-9.1 (-10.5)	-8.2 (-9.4)	-8.5 (-9.8)	-7.3 (-8.4)
Apr	---	-8.6 (-10.1)	-8.6 (-10.1)	-8.9 (-10.5)	-9.7 (-11.4)	-8.7 (-10.2)	-9.0 (-10.6)	-7.7 (-9.1)
May	---	-9.2 (-10.6)	-9.2 (-10.6)	-9.6 (-11.0)	-10.4 (-12.0)	-9.3 (-10.7)	-9.7 (-11.2)	-8.4 (-9.7)
Jun	---	-5.0 (-4.9)	-5.0 (-4.9)	-5.3 (-5.2)	-6.0 (-5.9)	-5.1 (-5.0)	-5.4 (-5.3)	-4.5 (-4.4)
Jul	---	-1.2 (-1.1)	-1.2 (-1.1)	-1.4 (-1.3)	-1.8 (-1.6)	-1.2 (-1.1)	-1.6 (-1.5)	-1.2 (-1.1)
Aug	---	-0.2 (-0.2)	-0.2 (-0.2)	-0.4 (-0.4)	-0.7 (-0.7)	-0.3 (-0.3)	-0.6 (-0.6)	-0.2 (-0.2)
Sep	---	-0.4 (-0.4)	-0.3 (-0.3)	-0.4 (-0.4)	-0.8 (-0.8)	-0.4 (-0.4)	-0.7 (-0.7)	-0.2 (-0.2)
Oct	---	-0.9 (-0.9)	-0.8 (-0.8)	-0.9 (-0.9)	-1.3 (-1.2)	-0.8 (-0.8)	-1.2 (-1.1)	-0.7 (-0.7)
Nov	---	-2.1 (-2.0)	-2.1 (-2.0)	-2.3 (-2.2)	-2.5 (-2.4)	-2.2 (-2.1)	-2.4 (-2.3)	-2.0 (-1.9)
Dec	---	-4.8 (-4.8)	-4.9 (-4.9)	-4.9 (-4.9)	-5.1 (-5.1)	-4.9 (-4.9)	-5.0 (-5.0)	-4.7 (-4.7)
Average	---	-4.7 (-4.8)	-4.7 (-4.8)	-4.9 (-5.0)	-5.4 (-5.5)	-4.8 (-4.9)	-5.0 (-5.2)	-4.3 (-4.4)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 142. Monthly Water Surface Elevation Normal Year (2005) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,817.9	9,815.5	9,815.6	9,815.7	9,815.8	9,815.8	9,814.6	9,815.2
Feb	9,814.1	9,815.3	9,815.5	9,815.6	9,815.5	9,815.7	9,814.4	9,815.0
Mar	9,810.1	9,814.9	9,815.1	9,815.2	9,815.1	9,815.3	9,814.0	9,814.5
Apr	9,806.4	9,813.9	9,814.1	9,814.2	9,814.0	9,814.3	9,813.0	9,813.6
May	9,808.0	9,815.6	9,815.8	9,816.1	9,815.9	9,816.1	9,814.7	9,815.3
Jun	9,830.7	9,836.8	9,837.1	9,837.3	9,836.9	9,837.4	9,836.3	9,836.7
Jul	9,846.4	9,851.0	9,851.4	9,851.6	9,851.1	9,851.6	9,850.6	9,851.0
Aug	9,842.8	9,847.5	9,847.7	9,847.7	9,847.5	9,847.8	9,847.4	9,847.6
Sep	9,840.3	9,846.6	9,846.9	9,847.0	9,846.5	9,847.1	9,846.4	9,846.6
Oct	9,843.4	9,847.9	9,848.2	9,848.2	9,847.9	9,848.2	9,847.7	9,847.8
Nov	9,842.4	9,846.2	9,846.9	9,846.8	9,846.6	9,846.8	9,846.5	9,846.4
Dec	9,836.9	9,836.8	9,837.2	9,837.2	9,837.0	9,837.3	9,837.1	9,836.7
Average	9,828.3	9,832.3	9,832.6	9,832.7	9,832.5	9,832.8	9,831.9	9,832.2
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.1 (0.1)	0.1 (0.2)	0.2 (0.4)	0.3 (0.4)	-0.9 (-1.4)	-0.4 (-0.5)
Feb	---	---	0.2 (0.3)	0.3 (0.4)	0.2 (0.3)	0.4 (0.6)	-0.8 (-1.3)	-0.3 (-0.4)
Mar	---	---	0.2 (0.3)	0.3 (0.4)	0.2 (0.3)	0.4 (0.6)	-0.9 (-1.4)	-0.3 (-0.5)
Apr	---	---	0.2 (0.3)	0.3 (0.5)	0.2 (0.3)	0.4 (0.6)	-0.9 (-1.4)	-0.3 (-0.5)
May	---	---	0.2 (0.4)	0.5 (0.8)	0.3 (0.4)	0.5 (0.8)	-0.9 (-1.3)	-0.3 (-0.4)
Jun	---	---	0.3 (0.3)	0.5 (0.6)	0.1 (0.1)	0.5 (0.6)	-0.6 (-0.7)	-0.1 (-0.1)
Jul	---	---	0.4 (0.4)	0.6 (0.6)	0.1 (0.1)	0.6 (0.6)	-0.4 (-0.4)	0.0 (0.0)
Aug	---	---	0.2 (0.2)	0.2 (0.2)	0.0 (0.0)	0.3 (0.3)	-0.1 (-0.1)	0.0 (0.1)
Sep	---	---	0.3 (0.3)	0.5 (0.5)	-0.1 (-0.1)	0.5 (0.5)	-0.1 (-0.2)	0.0 (0.0)
Oct	---	---	0.3 (0.3)	0.3 (0.3)	0.1 (0.1)	0.4 (0.4)	-0.1 (-0.1)	0.0 (0.0)
Nov	---	---	0.6 (0.6)	0.6 (0.6)	0.3 (0.3)	0.5 (0.6)	0.2 (0.2)	0.1 (0.1)
Dec	---	---	0.4 (0.4)	0.4 (0.5)	0.1 (0.2)	0.4 (0.5)	0.2 (0.3)	-0.1 (-0.2)
Average	---	---	0.3 (0.3)	0.4 (0.5)	0.1 (0.2)	0.4 (0.5)	-0.4 (-0.5)	-0.1 (-0.2)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-2.4 (-3.5)	-2.3 (-3.4)	-2.2 (-3.3)	-2.1 (-3.2)	-2.1 (-3.1)	-3.3 (-4.9)	-2.7 (-4.0)
Feb	---	1.2 (1.9)	1.4 (2.2)	1.5 (2.4)	1.4 (2.2)	1.6 (2.5)	0.4 (0.6)	1.0 (1.5)
Mar	---	4.8 (8.0)	5.0 (8.3)	5.1 (8.4)	5.0 (8.3)	5.2 (8.6)	3.9 (6.5)	4.5 (7.4)
Apr	---	7.5 (13.3)	7.7 (13.6)	7.8 (13.8)	7.7 (13.6)	7.9 (14.0)	6.6 (11.7)	7.2 (12.7)
May	---	7.6 (13.1)	7.8 (13.5)	8.1 (14.0)	7.9 (13.6)	8.1 (14.0)	6.8 (11.6)	7.3 (12.6)
Jun	---	6.1 (7.6)	6.4 (8.0)	6.6 (8.2)	6.2 (7.7)	6.7 (8.3)	5.5 (6.9)	6.0 (7.4)
Jul	---	4.6 (4.7)	5.0 (5.2)	5.2 (5.4)	4.7 (4.9)	5.2 (5.4)	4.2 (4.3)	4.6 (4.7)
Aug	---	4.8 (5.1)	4.9 (5.3)	5.0 (5.4)	4.7 (5.1)	5.0 (5.4)	4.7 (5.0)	4.8 (5.2)
Sep	---	6.2 (6.9)	6.6 (7.3)	6.7 (7.4)	6.1 (6.8)	6.7 (7.4)	6.1 (6.7)	6.3 (6.9)
Oct	---	4.5 (4.8)	4.8 (5.2)	4.9 (5.2)	4.6 (4.9)	4.9 (5.2)	4.4 (4.7)	4.5 (4.8)
Nov	---	3.9 (4.2)	4.5 (4.9)	4.4 (4.8)	4.2 (4.6)	4.4 (4.8)	4.1 (4.4)	4.0 (4.3)
Dec	---	-0.1 (-0.1)	0.3 (0.3)	0.3 (0.3)	0.0 (0.1)	0.3 (0.4)	0.1 (0.1)	-0.3 (-0.3)
Average	---	4.1 (5.2)	4.3 (5.5)	4.4 (5.7)	4.2 (5.4)	4.5 (5.7)	3.6 (4.6)	3.9 (5.0)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 143. Monthly Water Surface Elevation Wet Year (1997) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,853.0	9,839.5	9,839.3	9,839.2	9,839.3	9,839.2	9,839.8	9,839.7
Feb	9,851.2	9,828.9	9,829.1	9,829.3	9,829.5	9,829.2	9,830.0	9,830.3
Mar	9,853.0	9,827.9	9,828.3	9,828.3	9,828.6	9,828.3	9,829.0	9,829.3
Apr	9,850.9	9,825.2	9,825.8	9,825.7	9,826.1	9,825.8	9,826.5	9,826.9
May	9,851.5	9,831.2	9,830.8	9,830.6	9,832.0	9,830.9	9,831.4	9,831.8
Jun	9,866.8	9,858.2	9,858.0	9,857.8	9,858.5	9,858.0	9,858.2	9,858.4
Jul	9,869.1	9,867.3	9,867.1	9,866.9	9,867.1	9,867.1	9,867.2	9,867.1
Aug	9,866.1	9,866.4	9,866.3	9,866.1	9,866.2	9,866.2	9,866.3	9,866.3
Sep	9,863.3	9,864.5	9,864.4	9,864.2	9,864.3	9,864.3	9,864.4	9,864.4
Oct	9,863.2	9,864.3	9,864.2	9,864.0	9,864.1	9,864.1	9,864.2	9,864.2
Nov	9,861.9	9,862.3	9,862.2	9,862.0	9,862.1	9,862.1	9,862.3	9,862.2
Dec	9,858.3	9,857.1	9,857.0	9,856.8	9,856.8	9,856.9	9,857.0	9,857.0
Average	9,859.0	9,849.4	9,849.4	9,849.2	9,849.6	9,849.3	9,849.7	9,849.8
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.2 (-0.2)	-0.3 (-0.3)	-0.2 (-0.2)	-0.3 (-0.3)	0.3 (0.3)	0.2 (0.2)
Feb	---	---	0.2 (0.3)	0.4 (0.5)	0.6 (0.8)	0.3 (0.4)	1.1 (1.4)	1.4 (1.8)
Mar	---	---	0.4 (0.5)	0.4 (0.5)	0.7 (0.9)	0.4 (0.5)	1.1 (1.4)	1.4 (1.8)
Apr	---	---	0.6 (0.8)	0.5 (0.7)	0.9 (1.2)	0.6 (0.8)	1.3 (1.7)	1.7 (2.3)
May	---	---	-0.4 (-0.5)	-0.6 (-0.7)	0.8 (1.0)	-0.4 (-0.5)	0.2 (0.2)	0.6 (0.7)
Jun	---	---	-0.2 (-0.2)	-0.5 (-0.5)	0.3 (0.3)	-0.2 (-0.2)	0.0 (0.0)	0.2 (0.2)
Jul	---	---	-0.2 (-0.2)	-0.4 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.1 (-0.1)	-0.2 (-0.2)
Aug	---	---	-0.1 (-0.1)	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)
Sep	---	---	-0.1 (-0.1)	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)
Oct	---	---	-0.1 (-0.1)	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)
Nov	---	---	-0.1 (-0.1)	-0.3 (-0.3)	-0.2 (-0.2)	-0.2 (-0.2)	0.0 (0.0)	-0.1 (-0.1)
Dec	---	---	-0.1 (-0.1)	-0.3 (-0.3)	-0.3 (-0.3)	-0.2 (-0.2)	-0.1 (-0.1)	-0.1 (-0.1)
Average	---	---	0.0 (0.0)	-0.2 (-0.2)	0.2 (0.2)	-0.1 (-0.1)	0.3 (0.3)	0.4 (0.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-13.1 (-13.1)	-13.7 (-13.3)	-13.8 (-13.4)	-13.7 (-13.3)	-13.8 (-13.4)	-13.2 (-12.8)	-13.3 (-12.9)
Feb	---	-22.3 (-22.0)	-22.1 (-21.8)	-21.9 (-21.6)	-21.7 (-21.4)	-22.0 (-21.7)	-21.2 (-20.9)	-20.9 (-20.7)
Mar	---	-25.1 (-24.4)	-24.7 (-24.0)	-24.7 (-24.0)	-24.4 (-23.7)	-24.7 (-24.0)	-24.0 (-23.3)	-23.7 (-23.0)
Apr	---	-25.7 (-25.5)	-25.1 (-24.9)	-25.2 (-25.0)	-24.8 (-24.6)	-25.1 (-24.9)	-24.4 (-24.2)	-24.0 (-23.8)
May	---	-20.3 (-20.0)	-20.7 (-20.4)	-20.9 (-20.6)	-19.5 (-19.2)	-20.7 (-20.4)	-20.1 (-19.8)	-19.7 (-19.4)
Jun	---	-8.6 (-7.4)	-8.8 (-7.5)	-9.1 (-7.8)	-8.3 (-7.1)	-8.8 (-7.5)	-8.6 (-7.4)	-8.4 (-7.2)
Jul	---	-1.8 (-1.5)	-2.0 (-1.7)	-2.2 (-1.8)	-2.0 (-1.7)	-2.0 (-1.7)	-1.9 (-1.6)	-2.0 (-1.7)
Aug	---	0.3 (0.3)	0.2 (0.2)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.2 (0.2)	0.2 (0.2)
Sep	---	1.2 (1.1)	1.1 (1.0)	0.9 (0.8)	1.0 (0.9)	1.0 (0.9)	1.1 (1.0)	1.1 (1.0)
Oct	---	1.1 (1.0)	1.0 (0.9)	0.8 (0.7)	0.9 (0.8)	0.9 (0.8)	1.0 (0.9)	1.0 (0.9)
Nov	---	0.4 (0.4)	0.3 (0.3)	0.1 (0.1)	0.2 (0.2)	0.2 (0.2)	0.4 (0.4)	0.3 (0.3)
Dec	---	-1.2 (-1.1)	-1.3 (-1.2)	-1.5 (-1.4)	-1.5 (-1.4)	-1.4 (-1.3)	-1.3 (-1.2)	-1.3 (-1.2)
Average	---	-9.6 (-8.8)	-9.6 (-8.9)	-9.8 (-9.0)	-9.5 (-8.7)	-9.7 (-8.9)	-9.3 (-8.6)	-9.2 (-8.5)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 144. Monthly Water Surface Elevation Dry Year (2004) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,820.0	9,824.5	9,824.0	9,824.0	9,824.8	9,824.0	9,823.1	9,823.6
Feb	9,816.2	9,823.6	9,823.0	9,823.1	9,823.9	9,823.1	9,822.2	9,822.7
Mar	9,812.6	9,822.8	9,822.3	9,822.4	9,823.2	9,822.3	9,821.4	9,821.9
Apr	9,809.8	9,822.4	9,821.9	9,822.0	9,822.7	9,821.9	9,821.0	9,821.5
May	9,816.0	9,826.4	9,825.9	9,825.9	9,826.6	9,826.0	9,824.5	9,825.5
Jun	9,830.4	9,837.4	9,836.7	9,836.6	9,837.5	9,836.8	9,835.5	9,836.7
Jul	9,829.1	9,839.1	9,838.4	9,838.4	9,839.3	9,838.5	9,837.3	9,838.3
Aug	9,821.8	9,833.6	9,832.8	9,832.8	9,833.7	9,832.9	9,831.7	9,832.7
Sep	9,818.3	9,830.6	9,829.9	9,829.8	9,830.7	9,830.0	9,828.8	9,829.8
Oct	9,818.5	9,832.6	9,832.0	9,832.0	9,832.7	9,832.1	9,831.0	9,831.9
Nov	9,820.2	9,829.5	9,828.7	9,828.7	9,829.6	9,828.8	9,828.2	9,828.9
Dec	9,819.8	9,820.6	9,819.4	9,819.4	9,820.4	9,819.5	9,819.3	9,819.9
Average	9,819.4	9,828.6	9,827.9	9,827.9	9,828.8	9,828.0	9,827.0	9,827.8
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.5 (-0.7)	-0.5 (-0.7)	0.3 (0.4)	-0.5 (-0.7)	-1.4 (-1.9)	-0.9 (-1.2)
Feb	---	---	-0.5 (-0.7)	-0.4 (-0.5)	0.4 (0.5)	-0.4 (-0.5)	-1.3 (-1.8)	-0.8 (-1.1)
Mar	---	---	-0.5 (-0.7)	-0.4 (-0.5)	0.4 (0.5)	-0.5 (-0.7)	-1.4 (-1.9)	-0.9 (-1.2)
Apr	---	---	-0.5 (-0.7)	-0.4 (-0.6)	0.3 (0.4)	-0.5 (-0.7)	-1.4 (-1.9)	-0.9 (-1.2)
May	---	---	-0.5 (-0.7)	-0.5 (-0.7)	0.2 (0.3)	-0.4 (-0.5)	-1.9 (-2.5)	-0.9 (-1.2)
Jun	---	---	-0.7 (-0.8)	-0.8 (-0.9)	0.1 (0.1)	-0.6 (-0.7)	-1.9 (-2.2)	-0.7 (-0.8)
Jul	---	---	-0.7 (-0.8)	-0.7 (-0.8)	0.2 (0.2)	-0.6 (-0.7)	-1.8 (-2.0)	-0.8 (-0.9)
Aug	---	---	-0.7 (-0.8)	-0.7 (-0.8)	0.2 (0.2)	-0.6 (-0.7)	-1.8 (-2.2)	-0.8 (-1.0)
Sep	---	---	-0.7 (-0.9)	-0.8 (-1.0)	0.1 (0.1)	-0.6 (-0.7)	-1.9 (-2.4)	-0.8 (-1.0)
Oct	---	---	-0.6 (-0.7)	-0.6 (-0.7)	0.1 (0.1)	-0.5 (-0.6)	-1.6 (-1.9)	-0.7 (-0.8)
Nov	---	---	-0.8 (-1.0)	-0.8 (-1.0)	0.1 (0.1)	-0.7 (-0.9)	-1.3 (-1.6)	-0.6 (-0.8)
Dec	---	---	-1.2 (-1.7)	-1.2 (-1.7)	-0.2 (-0.3)	-1.1 (-1.6)	-1.3 (-1.8)	-0.7 (-1.0)
Average	---	---	-0.7 (-0.8)	-0.7 (-0.8)	0.2 (0.2)	-0.6 (-0.7)	-1.6 (-2.0)	-0.8 (-1.0)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	4.5 (6.4)	4.0 (5.7)	4.0 (5.7)	4.8 (6.9)	4.0 (5.7)	3.1 (4.4)	3.6 (5.1)
Feb	---	7.4 (11.2)	6.9 (10.4)	7.0 (10.6)	7.8 (11.8)	7.0 (10.6)	6.1 (9.2)	6.6 (10.0)
Mar	---	10.2 (16.3)	9.7 (15.5)	9.8 (15.7)	10.6 (16.9)	9.7 (15.5)	8.8 (14.1)	9.3 (14.9)
Apr	---	12.6 (21.1)	12.1 (20.2)	12.2 (20.4)	12.9 (21.6)	12.1 (20.2)	11.2 (18.7)	11.7 (19.6)
May	---	10.4 (15.8)	9.9 (15.0)	9.9 (15.0)	10.6 (16.1)	10.0 (15.2)	8.5 (12.9)	9.5 (14.4)
Jun	---	7.0 (8.7)	6.3 (7.8)	6.2 (7.7)	7.1 (8.8)	6.4 (8.0)	5.1 (6.3)	6.3 (7.8)
Jul	---	10.0 (12.6)	9.3 (11.8)	9.3 (11.8)	10.2 (12.9)	9.4 (11.9)	8.2 (10.4)	9.2 (11.6)
Aug	---	11.7 (16.3)	11.0 (15.3)	11.0 (15.3)	11.9 (16.6)	11.1 (15.5)	9.9 (13.8)	10.9 (15.2)
Sep	---	12.3 (18.0)	11.6 (17.0)	11.5 (16.8)	12.4 (18.2)	11.7 (17.1)	10.4 (15.2)	11.5 (16.8)
Oct	---	14.1 (20.6)	13.5 (19.7)	13.5 (19.7)	14.2 (20.7)	13.6 (19.9)	12.5 (18.2)	13.4 (19.6)
Nov	---	9.3 (13.2)	8.5 (12.1)	8.5 (12.1)	9.4 (13.4)	8.6 (12.3)	8.0 (11.4)	8.7 (12.4)
Dec	---	0.8 (1.1)	-0.4 (-0.6)	-0.4 (-0.6)	0.6 (0.9)	-0.3 (-0.4)	-0.5 (-0.7)	0.1 (0.1)
Average	---	9.2 (13.2)	8.5 (12.3)	8.5 (12.3)	9.4 (13.5)	8.6 (12.4)	7.6 (11.0)	8.4 (12.1)

* Percent changes are calculated using a minimum reservoir water elevation of 9750.0 feet.

Table 145. Monthly Surface Area Overall Average – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	708	708	708	708	707	708	708	708
Feb	702	702	702	702	702	702	702	702
Mar	700	699	700	700	699	700	700	700
Apr	698	697	698	698	697	698	698	698
May	700	700	700	700	699	700	700	700
Jun	716	715	716	716	715	716	716	716
Jul	724	724	724	724	724	724	724	724
Aug	721	721	722	721	721	722	722	722
Sep	720	720	720	720	720	720	720	720
Oct	720	719	720	720	719	720	720	720
Nov	718	718	718	718	718	718	718	718
Dec	714	713	714	714	713	714	714	714
Average	712	711	712	712	711	712	712	712
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	0 (0.1)	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.1)	0 (0.1)
Feb	---	---	0 (0.1)	0 (0.0)	0 (-0.1)	0 (0.1)	1 (0.1)	0 (0.1)
Mar	---	---	1 (0.1)	0 (0.0)	-1 (-0.1)	1 (0.1)	1 (0.1)	1 (0.1)
Apr	---	---	1 (0.1)	0 (0.0)	-1 (-0.1)	1 (0.1)	1 (0.1)	1 (0.1)
May	---	---	1 (0.1)	0 (0.0)	-1 (-0.1)	1 (0.1)	1 (0.1)	1 (0.1)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)	1 (0.1)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Sep	---	---	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	1 (0.1)	0 (0.1)
Oct	---	---	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Nov	---	---	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Dec	---	---	1 (0.1)	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.1)	1 (0.1)
Average	---	---	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	1 (0.1)	1 (0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.1)	0 (0.1)	1 (0.1)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.1)	1 (0.1)	1 (0.1)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.1)	1 (0.1)	1 (0.1)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (-0.1)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)

Table 146. Monthly Surface Area Normal Year (2005) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	679	681	681	681	681	681	681	681
Feb	675	677	676	677	676	677	677	676
Mar	670	672	671	671	671	671	671	671
Apr	666	668	667	667	667	667	667	667
May	668	670	669	669	670	669	669	669
Jun	694	695	694	694	695	694	695	694
Jul	710	711	711	711	711	711	711	711
Aug	707	707	707	707	707	707	707	707
Sep	704	705	705	705	705	705	705	704
Oct	707	707	707	707	707	707	707	707
Nov	706	706	706	706	706	706	706	706
Dec	701	700	700	700	700	700	700	700
Average	691	692	691	691	691	691	691	691
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	-1 (-0.1)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Mar	---	---	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Apr	---	---	-1 (-0.1)	0 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
May	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	-1 (-0.2)
Jun	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	-1 (-0.1)
Jul	---	---	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Aug	---	---	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Sep	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	-1 (-0.1)
Oct	---	---	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Nov	---	---	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Average	---	---	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	2 (0.3)	2 (0.3)	2 (0.3)	2 (0.2)	2 (0.3)	2 (0.3)	1 (0.2)
Feb	---	2 (0.3)	2 (0.3)	2 (0.3)	2 (0.2)	2 (0.3)	2 (0.3)	1 (0.2)
Mar	---	2 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.1)
Apr	---	2 (0.3)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.1)
May	---	2 (0.3)	1 (0.2)	1 (0.2)	2 (0.3)	1 (0.2)	1 (0.2)	1 (0.1)
Jun	---	1 (0.2)	1 (0.1)	1 (0.1)	1 (0.2)	1 (0.1)	1 (0.1)	0 (0.1)
Jul	---	1 (0.1)	0 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	0 (0.0)
Aug	---	1 (0.1)	0 (0.1)	0 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	0 (0.0)
Sep	---	1 (0.1)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.1)	0 (0.1)	0 (0.0)
Oct	---	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	-1 (-0.1)
Nov	---	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
Dec	---	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	-1 (-0.1)
Average	---	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	0 (0.1)

Table 147. Monthly Surface Area Wet Year (1997) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)														
Jan	717	717	718		718		717		718		718		718	
Feb	715	715	717		717		714		717		717		717	
Mar	717	717	718		718		716		718		718		718	
Apr	715	714	717		717		713		717		717		717	
May	715	715	717		717		713		717		717		718	
Jun	731	731	732		732		730		732		732		732	
Jul	734	734	734		734		734		734		734		734	
Aug	731	730	731		731		730		731		731		731	
Sep	728	727	727		727		727		727		727		728	
Oct	727	727	727		727		727		727		727		728	
Nov	726	726	726		726		726		726		726		726	
Dec	722	722	722		722		722		722		722		722	
Average	723	723	724		724		723		724		724		724	
Change in Surface Area Compared to No Action [acres (%)]														
Jan	---	---	1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.2)	1	(0.2)
Feb	---	---	2	(0.2)	2	(0.2)	-1	(-0.1)	2	(0.2)	2	(0.2)	2	(0.2)
Mar	---	---	2	(0.2)	2	(0.2)	-1	(-0.1)	2	(0.2)	2	(0.2)	2	(0.2)
Apr	---	---	2	(0.3)	2	(0.3)	-1	(-0.2)	2	(0.3)	2	(0.3)	3	(0.4)
May	---	---	3	(0.3)	2	(0.3)	-2	(-0.2)	3	(0.3)	2	(0.3)	3	(0.4)
Jun	---	---	1	(0.2)	1	(0.2)	-1	(-0.1)	1	(0.2)	1	(0.2)	1	(0.2)
Jul	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Sep	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Oct	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Nov	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	1	(0.1)
Dec	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Average	---	---	1	(0.1)	1	(0.1)	0	(-0.1)	1	(0.1)	1	(0.1)	1	(0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]														
Jan	---	---	1	(0.2)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.2)	1	(0.2)
Feb	---	---	1	(0.2)	1	(0.2)	-1	(-0.1)	1	(0.2)	2	(0.2)	2	(0.2)
Mar	---	---	1	(0.2)	1	(0.2)	-1	(-0.2)	1	(0.2)	1	(0.2)	1	(0.2)
Apr	---	---	2	(0.2)	2	(0.2)	-2	(-0.3)	2	(0.2)	2	(0.2)	2	(0.3)
May	---	---	2	(0.3)	2	(0.3)	-2	(-0.3)	2	(0.3)	2	(0.3)	3	(0.3)
Jun	---	---	1	(0.1)	1	(0.1)	-1	(-0.2)	1	(0.1)	1	(0.1)	1	(0.2)
Jul	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---	0	(0.0)	0	(0.0)	0	(-0.1)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---	0	(0.0)	0	(0.0)	0	(-0.1)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---	---	0	(0.0)	0	(0.0)	0	(-0.1)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	---	0	(0.0)	0	(0.0)	0	(-0.1)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---	1	(0.1)	1	(0.1)	-1	(-0.1)	1	(0.1)	1	(0.1)	1	(0.1)

Table 148. Monthly Surface Area Dry Year (2004) – Turquoise Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	682		682		683		683		682		683		683		683
Feb	677		678		679		679		677		679		679		678
Mar	673		674		675		675		673		675		675		674
Apr	670		671		671		671		670		671		671		671
May	677		678		678		678		677		678		678		678
Jun	693		694		694		694		694		694		694		694
Jul	692		693		693		693		692		693		693		693
Aug	684		685		685		685		685		685		685		685
Sep	680		681		681		682		681		682		682		681
Oct	680		682		682		682		682		682		682		681
Nov	682		684		684		684		684		684		684		683
Dec	682		683		683		683		683		683		683		683
Average	681		682		682		683		682		683		683		682
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---		---	1	(0.1)	1	(0.1)	0	(-0.1)	1	(0.1)	1	(0.1)	1	(0.1)
Feb	---		---	1	(0.1)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.2)	1	(0.1)
Mar	---		---	1	(0.1)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.2)	1	(0.1)
Apr	---		---	1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	0	(0.0)
May	---		---	1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	0	(0.0)
Jun	---		---	1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	0	(0.0)
Jul	---		---	0	(0.0)	0	(0.1)	0	(0.0)	0	(0.1)	0	(0.1)	0	(0.0)
Aug	---		---	0	(0.0)	0	(0.1)	0	(0.0)	0	(0.1)	0	(0.0)	0	(0.0)
Sep	---		---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---		---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(-0.1)
Nov	---		---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(-0.1)
Dec	---		---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(-0.1)
Average	---		---	0	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	0	(0.0)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	1	(0.1)	2	(0.2)	2	(0.2)	0	(0.0)	2	(0.2)	2	(0.2)	1	(0.2)
Feb	---	1	(0.1)	2	(0.2)	2	(0.3)	0	(0.0)	2	(0.3)	2	(0.3)	1	(0.2)
Mar	---	1	(0.1)	2	(0.2)	2	(0.3)	0	(0.1)	2	(0.3)	2	(0.3)	1	(0.2)
Apr	---	1	(0.1)	2	(0.2)	2	(0.3)	1	(0.1)	2	(0.3)	2	(0.3)	1	(0.2)
May	---	1	(0.1)	1	(0.2)	2	(0.2)	1	(0.1)	2	(0.2)	2	(0.2)	1	(0.2)
Jun	---	1	(0.1)	1	(0.1)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.2)	1	(0.1)
Jul	---	1	(0.1)	1	(0.2)	1	(0.2)	1	(0.1)	1	(0.2)	1	(0.2)	1	(0.1)
Aug	---	1	(0.1)	1	(0.2)	1	(0.2)	1	(0.1)	1	(0.2)	1	(0.2)	1	(0.1)
Sep	---	2	(0.2)	2	(0.2)	2	(0.3)	1	(0.2)	2	(0.3)	2	(0.3)	1	(0.2)
Oct	---	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.3)	1	(0.2)
Nov	---	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.3)	1	(0.2)
Dec	---	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.2)	2	(0.3)	2	(0.3)	1	(0.2)
Average	---	1	(0.2)	1	(0.2)	2	(0.2)	1	(0.1)	2	(0.2)	2	(0.2)	1	(0.2)

Table 149. Monthly Surface Area Overall Average – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	707.93	700.02	699.93	699.87	699.61	699.96	699.72	700.32
Feb	702.18	693.31	693.21	692.97	692.55	693.20	693.00	693.94
Mar	699.68	691.18	691.15	690.82	690.18	691.07	690.75	691.99
Apr	697.69	688.62	688.72	688.35	687.46	688.59	688.19	689.60
May	699.70	689.99	690.03	689.64	688.76	689.90	689.45	690.89
Jun	715.76	710.53	710.54	710.23	709.49	710.44	710.08	711.04
Jul	724.18	722.88	722.91	722.66	722.30	722.84	722.49	722.88
Aug	721.47	721.22	721.24	721.04	720.71	721.18	720.86	721.28
Sep	719.91	719.47	719.55	719.41	719.08	719.49	719.10	719.66
Oct	719.56	718.69	718.73	718.58	718.29	718.68	718.36	718.91
Nov	717.89	715.68	715.68	715.52	715.29	715.63	715.40	715.82
Dec	713.69	708.72	708.62	708.58	708.35	708.61	708.46	708.80
Average	711.64	706.69	706.69	706.47	706.01	706.63	706.32	707.09
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	1 (0.1)
Mar	---	---	0 (0.0)	0 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	1 (0.1)
Apr	---	---	0 (0.0)	0 (0.0)	-1 (-0.2)	0 (0.0)	0 (-0.1)	1 (0.1)
May	---	---	0 (0.0)	0 (-0.1)	-1 (-0.2)	0 (0.0)	-1 (-0.1)	1 (0.1)
Jun	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (-0.1)	1 (0.1)
Jul	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (-0.1)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (-0.1)	0 (0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-8 (-1.1)	-8 (-1.1)	-8 (-1.1)	-8 (-1.2)	-8 (-1.1)	-8 (-1.2)	-8 (-1.1)
Feb	---	-9 (-1.3)	-9 (-1.3)	-9 (-1.3)	-10 (-1.4)	-9 (-1.3)	-9 (-1.3)	-8 (-1.2)
Mar	---	-9 (-1.2)	-9 (-1.2)	-9 (-1.3)	-10 (-1.4)	-9 (-1.2)	-9 (-1.3)	-8 (-1.1)
Apr	---	-9 (-1.3)	-9 (-1.3)	-9 (-1.3)	-10 (-1.5)	-9 (-1.3)	-10 (-1.4)	-8 (-1.2)
May	---	-10 (-1.4)	-10 (-1.4)	-10 (-1.4)	-11 (-1.6)	-10 (-1.4)	-10 (-1.5)	-9 (-1.3)
Jun	---	-5 (-0.7)	-5 (-0.7)	-6 (-0.8)	-6 (-0.9)	-5 (-0.8)	-6 (-0.8)	-5 (-0.7)
Jul	---	-1 (-0.2)	-1 (-0.2)	-2 (-0.2)	-2 (-0.3)	-1 (-0.2)	-2 (-0.2)	-1 (-0.2)
Aug	---	0 (0.0)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	0 (0.0)
Sep	---	0 (-0.1)	0 (-0.1)	-1 (-0.1)	-1 (-0.1)	0 (-0.1)	-1 (-0.1)	0 (0.0)
Oct	---	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.2)	-1 (-0.1)	-1 (-0.2)	-1 (-0.1)
Nov	---	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-3 (-0.4)	-2 (-0.3)	-3 (-0.3)	-2 (-0.3)
Dec	---	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)
Average	---	-5 (-0.7)	-5 (-0.7)	-5 (-0.7)	-6 (-0.8)	-5 (-0.7)	-5 (-0.7)	-5 (-0.6)

Table 150. Monthly Surface Area Normal Year (2005) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	679.28	676.43	676.53	676.59	676.71	676.74	675.31	676.02
Feb	674.65	676.14	676.39	676.48	676.38	676.62	675.12	675.81
Mar	670.03	675.66	675.89	675.98	675.89	676.11	674.57	675.25
Apr	665.93	674.45	674.70	674.83	674.64	674.94	673.38	674.08
May	667.79	676.46	676.74	677.06	676.77	677.08	675.45	676.13
Jun	693.66	700.28	700.60	700.83	700.39	700.84	699.65	700.15
Jul	710.43	715.01	715.40	715.60	715.14	715.62	714.61	715.01
Aug	706.75	711.51	711.67	711.72	711.48	711.76	711.42	711.56
Sep	704.27	710.57	710.90	711.03	710.49	711.06	710.42	710.59
Oct	707.34	711.87	712.16	712.21	711.94	712.24	711.74	711.84
Nov	706.33	710.24	710.86	710.79	710.57	710.78	710.45	710.35
Dec	700.54	700.41	700.79	700.84	700.57	700.86	700.65	700.25
Average	690.58	694.92	695.22	695.33	695.08	695.39	694.40	694.75
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.2)	0 (-0.1)
Feb	---	---	0 (0.0)	0 (0.1)	0 (0.0)	1 (0.1)	-1 (-0.1)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	-1 (-0.2)	-1 (-0.1)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	-1 (-0.2)	0 (-0.1)
May	---	---	0 (0.0)	1 (0.1)	0 (0.0)	1 (0.1)	-1 (-0.1)	0 (-0.1)
Jun	---	---	0 (0.0)	1 (0.1)	0 (0.0)	1 (0.1)	-1 (-0.1)	0 (0.0)
Jul	---	---	0 (0.1)	1 (0.1)	0 (0.0)	1 (0.1)	0 (-0.1)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.1)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	1 (0.1)	1 (0.1)	0 (0.1)	1 (0.1)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.1)	0 (0.1)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)	-1 (-0.1)	0 (0.0)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-3 (-0.4)	-3 (-0.4)	-3 (-0.4)	-3 (-0.4)	-3 (-0.4)	-4 (-0.6)	-3 (-0.5)
Feb	---	1 (0.2)	2 (0.3)	2 (0.3)	2 (0.3)	2 (0.3)	0 (0.1)	1 (0.2)
Mar	---	6 (0.9)	6 (0.9)	6 (0.9)	6 (0.9)	6 (0.9)	5 (0.7)	5 (0.8)
Apr	---	9 (1.3)	9 (1.3)	9 (1.3)	9 (1.3)	9 (1.4)	8 (1.1)	8 (1.2)
May	---	9 (1.3)	9 (1.3)	9 (1.4)	9 (1.3)	9 (1.4)	8 (1.2)	8 (1.2)
Jun	---	7 (1.0)	7 (1.0)	7 (1.0)	7 (1.0)	7 (1.0)	6 (0.9)	6 (0.9)
Jul	---	5 (0.6)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	4 (0.6)	5 (0.6)
Aug	---	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)
Sep	---	6 (0.9)	7 (0.9)	7 (1.0)	6 (0.9)	7 (1.0)	6 (0.9)	6 (0.9)
Oct	---	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	4 (0.6)	5 (0.6)
Nov	---	4 (0.6)	5 (0.7)	5 (0.6)	4 (0.6)	5 (0.6)	4 (0.6)	4 (0.6)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)
Average	---	4 (0.6)	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.7)	4 (0.6)	4 (0.6)

Table 151. Monthly Surface Area Wet Year (1997) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	717.00	703.25	703.01	702.96	703.03	702.91	703.52	703.50
Feb	715.18	691.72	691.95	692.14	692.35	692.04	692.89	693.26
Mar	716.95	690.59	690.99	691.01	691.38	691.01	691.75	692.12
Apr	714.86	687.62	688.26	688.15	688.57	688.29	689.01	689.45
May	715.47	694.25	693.73	693.60	695.09	693.83	694.42	694.87
Jun	731.43	722.36	722.16	721.91	722.63	722.13	722.41	722.56
Jul	733.90	731.94	731.73	731.54	731.74	731.66	731.77	731.74
Aug	730.60	730.96	730.79	730.58	730.75	730.70	730.82	730.79
Sep	727.56	728.87	728.76	728.55	728.66	728.67	728.79	728.76
Oct	727.42	728.62	728.53	728.32	728.41	728.44	728.56	728.53
Nov	726.01	726.46	726.37	726.15	726.24	726.27	726.40	726.35
Dec	722.32	721.05	720.98	720.77	720.84	720.87	721.02	720.95
Average	723.23	713.14	713.11	712.97	713.31	713.07	713.45	713.57
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.1)	1 (0.1)	0 (0.0)	1 (0.2)	2 (0.2)
Mar	---	---	0 (0.1)	0 (0.1)	1 (0.1)	0 (0.1)	1 (0.2)	2 (0.2)
Apr	---	---	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.2)	2 (0.3)
May	---	---	-1 (-0.1)	-1 (-0.1)	1 (0.1)	0 (-0.1)	0 (0.0)	1 (0.1)
Jun	---	---	0 (0.0)	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-14 (-1.9)	-14 (-2.0)	-14 (-2.0)	-14 (-2.0)	-14 (-2.0)	-14 (-1.9)	-14 (-1.9)
Feb	---	-24 (-3.3)	-23 (-3.3)	-23 (-3.2)	-23 (-3.2)	-23 (-3.2)	-22 (-3.1)	-22 (-3.1)
Mar	---	-26 (-3.7)	-26 (-3.6)	-26 (-3.6)	-26 (-3.6)	-26 (-3.6)	-25 (-3.5)	-25 (-3.5)
Apr	---	-27 (-3.8)	-27 (-3.7)	-27 (-3.7)	-26 (-3.7)	-27 (-3.7)	-26 (-3.6)	-26 (-3.6)
May	---	-21 (-3.0)	-22 (-3.0)	-22 (-3.1)	-20 (-2.9)	-22 (-3.0)	-21 (-2.9)	-21 (-2.9)
Jun	---	-9 (-1.2)	-9 (-1.3)	-10 (-1.3)	-9 (-1.2)	-9 (-1.3)	-9 (-1.2)	-9 (-1.2)
Jul	---	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)	-2 (-0.3)
Aug	---	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	1 (0.2)	1 (0.2)	1 (0.1)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)
Oct	---	1 (0.2)	1 (0.2)	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.2)	1 (0.2)
Nov	---	1 (0.1)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.1)
Dec	---	-1 (-0.2)	-1 (-0.2)	-2 (-0.2)	-2 (-0.2)	-1 (-0.2)	-1 (-0.2)	-1 (-0.2)
Average	---	-10 (-1.4)	-10 (-1.4)	-10 (-1.4)	-10 (-1.4)	-10 (-1.4)	-10 (-1.4)	-10 (-1.3)

Table 152. Monthly Surface Area Dry Year (2004) – Turquoise Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	681.82	686.81	686.25	686.33	687.21	686.29	685.33	685.84
Feb	677.17	685.80	685.24	685.32	686.23	685.28	684.30	684.83
Mar	672.97	684.98	684.42	684.51	685.41	684.46	683.46	683.99
Apr	669.67	684.51	683.98	684.05	684.92	684.03	682.98	683.54
May	676.95	688.93	688.37	688.41	689.19	688.46	686.85	688.00
Jun	693.30	701.01	700.26	700.21	701.17	700.36	698.99	700.22
Jul	691.90	702.89	702.18	702.17	703.07	702.28	700.91	702.07
Aug	683.91	696.80	695.99	695.93	696.94	696.04	694.74	695.87
Sep	679.78	693.51	692.80	692.70	693.69	692.86	691.52	692.68
Oct	679.96	695.72	695.11	695.06	695.83	695.23	693.96	694.96
Nov	682.04	692.34	691.46	691.51	692.44	691.58	690.87	691.69
Dec	681.60	682.37	681.06	681.04	682.21	681.12	680.94	681.63
Average	680.92	691.31	690.59	690.60	691.53	690.67	689.57	690.44
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.1)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
Feb	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.1)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
Mar	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.1)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
Apr	---	---	-1 (-0.1)	0 (-0.1)	0 (0.1)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
May	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	0 (-0.1)	-2 (-0.3)	-1 (-0.1)
Jun	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.3)	-1 (-0.1)
Jul	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.3)	-1 (-0.1)
Aug	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.3)	-1 (-0.1)
Sep	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.3)	-1 (-0.1)
Oct	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
Nov	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.2)	-1 (-0.1)
Dec	---	---	-1 (-0.2)	-1 (-0.2)	0 (0.0)	-1 (-0.2)	-2 (-0.2)	-1 (-0.1)
Average	---	---	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-2 (-0.2)	-1 (-0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	5 (0.7)	5 (0.7)	5 (0.7)	5 (0.8)	5 (0.7)	4 (0.5)	4 (0.6)
Feb	---	9 (1.3)	8 (1.2)	8 (1.2)	9 (1.3)	8 (1.2)	7 (1.0)	8 (1.1)
Mar	---	12 (1.8)	11 (1.7)	12 (1.7)	12 (1.8)	12 (1.7)	11 (1.6)	11 (1.6)
Apr	---	15 (2.2)	14 (2.1)	14 (2.2)	15 (2.3)	14 (2.1)	13 (2.0)	14 (2.1)
May	---	12 (1.8)	12 (1.7)	12 (1.7)	12 (1.8)	12 (1.7)	10 (1.5)	11 (1.6)
Jun	---	8 (1.1)	7 (1.0)	7 (1.0)	8 (1.1)	7 (1.0)	6 (0.8)	7 (1.0)
Jul	---	11 (1.6)	10 (1.5)	10 (1.5)	11 (1.6)	10 (1.5)	9 (1.3)	10 (1.5)
Aug	---	13 (1.9)	12 (1.8)	12 (1.8)	13 (1.9)	12 (1.8)	11 (1.6)	12 (1.8)
Sep	---	14 (2.0)	13 (1.9)	13 (1.9)	14 (2.0)	13 (1.9)	12 (1.7)	13 (1.9)
Oct	---	16 (2.3)	15 (2.2)	15 (2.2)	16 (2.3)	15 (2.2)	14 (2.1)	15 (2.2)
Nov	---	10 (1.5)	10 (1.4)	10 (1.4)	10 (1.5)	10 (1.4)	9 (1.3)	10 (1.4)
Dec	---	1 (0.1)	-1 (-0.1)	-1 (-0.1)	1 (0.1)	-1 (-0.1)	-1 (-0.1)	0 (0.0)
Average	---	10 (1.5)	10 (1.4)	10 (1.4)	11 (1.6)	10 (1.4)	9 (1.3)	10 (1.4)

Twin Lakes Reservoir

Twin Lakes Reservoir is located on Lake Creek, a tributary of the Arkansas River downstream of Lake Fork Creek. The reservoir typically diverts some native streamflow from Lake Creek, receives transmountain imports from the Twin Lakes Tunnel and receives both native and transmountain water from Turquoise Reservoir through the Mt. Elbert Conduit. Colorado Springs and Pueblo West have non Fry-Ark Project accounts in Twin Lakes Reservoir. Colorado Springs' accounts would be primarily used to supply the Otero Pump Station.

Mean monthly direct effects analysis storage contents for Twin Lakes Reservoir are presented in Table 153 through Table 156. As shown, all effects are negligible for this reservoir. Upper Basin reservoirs are not affected by operations of Master Contract of the AVC. Cumulative Effects storage contents for Twin Lakes Reservoir are presented in Table 157 through Table 160. All effects are negligible for Cumulative Effects as well.

Table 153. Monthly Storage Contents Overall Average – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	101,500	100,400	100,600	100,600	100,500	100,600	100,600	100,600
Feb	98,700	97,500	97,700	97,700	97,600	97,700	97,700	97,800
Mar	97,100	95,900	96,200	96,200	96,000	96,200	96,200	96,200
Apr	96,100	94,800	95,200	95,100	94,900	95,200	95,200	95,200
May	98,900	97,400	97,900	97,900	97,500	97,900	97,900	98,000
Jun	118,300	117,300	117,700	117,600	117,200	117,700	117,600	117,900
Jul	125,400	124,700	124,700	124,700	124,500	124,800	124,800	125,000
Aug	119,900	119,000	119,200	119,200	119,100	119,200	119,200	119,200
Sep	115,200	114,100	114,300	114,300	114,200	114,300	114,300	114,300
Oct	112,000	110,800	110,900	110,900	110,800	111,000	110,900	111,000
Nov	109,300	108,100	108,200	108,200	108,100	108,200	108,200	108,300
Dec	105,400	104,300	104,400	104,500	104,400	104,500	104,500	104,500
Average	108,200	107,100	107,300	107,300	107,100	107,300	107,300	107,400
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	200 (0.2)	200 (0.2)	100 (0.1)	200 (0.2)	200 (0.2)	200 (0.2)
Feb	---	---	200 (0.2)	200 (0.2)	100 (0.1)	200 (0.2)	200 (0.2)	300 (0.3)
Mar	---	---	300 (0.3)	300 (0.3)	100 (0.1)	300 (0.3)	300 (0.3)	300 (0.3)
Apr	---	---	400 (0.4)	300 (0.3)	100 (0.1)	400 (0.4)	400 (0.4)	400 (0.4)
May	---	---	500 (0.5)	500 (0.5)	100 (0.1)	500 (0.5)	500 (0.5)	600 (0.6)
Jun	---	---	400 (0.3)	300 (0.3)	-100 (-0.1)	400 (0.3)	300 (0.3)	600 (0.5)
Jul	---	---	0 (0.0)	0 (0.0)	-200 (-0.2)	100 (0.1)	100 (0.1)	300 (0.2)
Aug	---	---	200 (0.2)	200 (0.2)	100 (0.1)	200 (0.2)	200 (0.2)	200 (0.2)
Sep	---	---	200 (0.2)	200 (0.2)	100 (0.1)	200 (0.2)	200 (0.2)	200 (0.2)
Oct	---	---	100 (0.1)	100 (0.1)	0 (0.0)	200 (0.2)	100 (0.1)	200 (0.2)
Nov	---	---	100 (0.1)	100 (0.1)	0 (0.0)	100 (0.1)	100 (0.1)	200 (0.2)
Dec	---	---	100 (0.1)	200 (0.2)	100 (0.1)	200 (0.2)	200 (0.2)	200 (0.2)
Average	---	---	200 (0.2)	200 (0.2)	0 (0.0)	200 (0.2)	200 (0.2)	300 (0.3)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-1,100 (-1.1)	-900 (-0.9)	-900 (-0.9)	-1,000 (-1.0)	-900 (-0.9)	-900 (-0.9)	-900 (-0.9)
Feb	---	-1,200 (-1.2)	-1,000 (-1.0)	-1,000 (-1.0)	-1,100 (-1.1)	-1,000 (-1.0)	-1,000 (-1.0)	-900 (-0.9)
Mar	---	-1,200 (-1.2)	-900 (-0.9)	-900 (-0.9)	-1,100 (-1.1)	-900 (-0.9)	-900 (-0.9)	-900 (-0.9)
Apr	---	-1,300 (-1.4)	-900 (-0.9)	-1,000 (-1.0)	-1,200 (-1.2)	-900 (-0.9)	-900 (-0.9)	-900 (-0.9)
May	---	-1,500 (-1.5)	-1,000 (-1.0)	-1,000 (-1.0)	-1,400 (-1.4)	-1,000 (-1.0)	-1,000 (-1.0)	-900 (-0.9)
Jun	---	-1,000 (-0.8)	-600 (-0.5)	-700 (-0.6)	-1,100 (-0.9)	-600 (-0.5)	-700 (-0.6)	-400 (-0.3)
Jul	---	-700 (-0.6)	-700 (-0.6)	-700 (-0.6)	-900 (-0.7)	-600 (-0.5)	-600 (-0.5)	-400 (-0.3)
Aug	---	-900 (-0.8)	-700 (-0.6)	-700 (-0.6)	-800 (-0.7)	-700 (-0.6)	-700 (-0.6)	-700 (-0.6)
Sep	---	-1,100 (-1.0)	-900 (-0.8)	-900 (-0.8)	-1,000 (-0.9)	-900 (-0.8)	-900 (-0.8)	-900 (-0.8)
Oct	---	-1,200 (-1.1)	-1,100 (-1.0)	-1,100 (-1.0)	-1,200 (-1.1)	-1,000 (-0.9)	-1,100 (-1.0)	-1,000 (-0.9)
Nov	---	-1,200 (-1.1)	-1,100 (-1.0)	-1,100 (-1.0)	-1,200 (-1.1)	-1,100 (-1.0)	-1,100 (-1.0)	-1,000 (-0.9)
Dec	---	-1,100 (-1.0)	-1,000 (-0.9)	-900 (-0.9)	-1,000 (-0.9)	-900 (-0.9)	-900 (-0.9)	-900 (-0.9)
Average	---	-1,100 (-1.0)	-900 (-0.8)	-900 (-0.8)	-1,100 (-1.0)	-900 (-0.8)	-900 (-0.8)	-800 (-0.7)

Table 154. Monthly Storage Contents Normal Year (2005) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	107,100	104,400	104,600	104,600	104,200	104,600	104,600	104,700
Feb	102,300	99,700	99,900	99,900	99,500	99,800	99,900	99,900
Mar	98,900	96,700	96,900	96,900	96,400	97,000	97,000	97,000
Apr	93,400	91,100	91,700	91,700	90,800	91,700	91,700	91,800
May	89,400	86,900	87,800	87,800	86,600	87,800	87,800	87,900
Jun	106,200	104,300	104,900	104,900	104,200	104,900	104,800	105,000
Jul	116,800	115,300	115,900	116,000	115,500	116,000	115,500	115,600
Aug	113,500	111,600	112,500	112,600	111,800	112,500	112,100	112,200
Sep	107,700	105,300	106,700	106,800	105,600	106,700	106,300	106,400
Oct	105,800	103,300	104,600	104,700	103,500	104,700	104,300	104,300
Nov	106,300	104,000	105,100	105,200	104,200	105,200	104,800	104,800
Dec	103,000	100,800	101,900	102,000	101,000	101,900	101,500	101,600
Average	104,200	102,000	102,700	102,800	102,000	102,800	102,500	102,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	200 (0.2)	200 (0.2)	-200 (-0.2)	200 (0.2)	200 (0.2)	300 (0.3)
Feb	---	---	200 (0.2)	200 (0.2)	-200 (-0.2)	100 (0.1)	200 (0.2)	200 (0.2)
Mar	---	---	200 (0.2)	200 (0.2)	-300 (-0.3)	300 (0.3)	300 (0.3)	300 (0.3)
Apr	---	---	600 (0.7)	600 (0.7)	-300 (-0.3)	600 (0.7)	600 (0.7)	700 (0.8)
May	---	---	900 (1.0)	900 (1.0)	-300 (-0.3)	900 (1.0)	900 (1.0)	1,000 (1.2)
Jun	---	---	600 (0.6)	600 (0.6)	-100 (-0.1)	600 (0.6)	500 (0.5)	700 (0.7)
Jul	---	---	600 (0.5)	700 (0.6)	200 (0.2)	700 (0.6)	200 (0.2)	300 (0.3)
Aug	---	---	900 (0.8)	1,000 (0.9)	200 (0.2)	900 (0.8)	500 (0.4)	600 (0.5)
Sep	---	---	1,400 (1.3)	1,500 (1.4)	300 (0.3)	1,400 (1.3)	1,000 (0.9)	1,100 (1.0)
Oct	---	---	1,300 (1.3)	1,400 (1.4)	200 (0.2)	1,400 (1.4)	1,000 (1.0)	1,000 (1.0)
Nov	---	---	1,100 (1.1)	1,200 (1.2)	200 (0.2)	1,200 (1.2)	800 (0.8)	800 (0.8)
Dec	---	---	1,100 (1.1)	1,200 (1.2)	200 (0.2)	1,100 (1.1)	700 (0.7)	800 (0.8)
Average	---	---	700 (0.7)	800 (0.8)	0 (0.0)	800 (0.8)	500 (0.5)	600 (0.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-2,700 (-2.5)	-2,500 (-2.3)	-2,500 (-2.3)	-2,900 (-2.7)	-2,500 (-2.3)	-2,500 (-2.3)	-2,400 (-2.2)
Feb	---	-2,600 (-2.5)	-2,400 (-2.3)	-2,400 (-2.3)	-2,800 (-2.7)	-2,500 (-2.4)	-2,400 (-2.3)	-2,400 (-2.3)
Mar	---	-2,200 (-2.2)	-2,000 (-2.0)	-2,000 (-2.0)	-2,500 (-2.5)	-1,900 (-1.9)	-1,900 (-1.9)	-1,900 (-1.9)
Apr	---	-2,300 (-2.5)	-1,700 (-1.8)	-1,700 (-1.8)	-2,600 (-2.8)	-1,700 (-1.8)	-1,700 (-1.8)	-1,600 (-1.7)
May	---	-2,500 (-2.8)	-1,600 (-1.8)	-1,600 (-1.8)	-2,800 (-3.1)	-1,600 (-1.8)	-1,600 (-1.8)	-1,500 (-1.7)
Jun	---	-1,900 (-1.8)	-1,300 (-1.2)	-1,300 (-1.2)	-2,000 (-1.9)	-1,300 (-1.2)	-1,400 (-1.3)	-1,200 (-1.1)
Jul	---	-1,500 (-1.3)	-900 (-0.8)	-800 (-0.7)	-1,300 (-1.1)	-800 (-0.7)	-1,300 (-1.1)	-1,200 (-1.0)
Aug	---	-1,900 (-1.7)	-1,000 (-0.9)	-900 (-0.8)	-1,700 (-1.5)	-1,000 (-0.9)	-1,400 (-1.2)	-1,300 (-1.1)
Sep	---	-2,400 (-2.2)	-1,000 (-0.9)	-900 (-0.8)	-2,100 (-1.9)	-1,000 (-0.9)	-1,400 (-1.3)	-1,300 (-1.2)
Oct	---	-2,500 (-2.4)	-1,200 (-1.1)	-1,100 (-1.0)	-2,300 (-2.2)	-1,100 (-1.0)	-1,500 (-1.4)	-1,500 (-1.4)
Nov	---	-2,300 (-2.2)	-1,200 (-1.1)	-1,100 (-1.0)	-2,100 (-2.0)	-1,100 (-1.0)	-1,500 (-1.4)	-1,500 (-1.4)
Dec	---	-2,200 (-2.1)	-1,100 (-1.1)	-1,000 (-1.0)	-2,000 (-1.9)	-1,100 (-1.1)	-1,500 (-1.5)	-1,400 (-1.4)
Average	---	-2,200 (-2.1)	-1,500 (-1.4)	-1,400 (-1.3)	-2,200 (-2.1)	-1,400 (-1.3)	-1,700 (-1.6)	-1,600 (-1.5)

Table 155. Monthly Storage Contents Wet Year (1997) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	104,300	103,200	102,500	102,500	103,000	102,500	102,500	102,700
Feb	99,800	98,700	97,900	97,900	98,600	98,000	97,900	98,100
Mar	97,900	96,800	96,100	96,000	96,700	96,100	96,000	96,200
Apr	98,300	96,900	96,400	96,300	96,700	96,400	96,400	96,500
May	101,700	100,000	99,900	99,800	99,800	99,900	99,900	100,000
Jun	129,400	128,200	128,900	128,800	127,600	129,000	128,900	129,300
Jul	140,300	140,300	140,300	140,300	140,300	140,300	140,300	140,300
Aug	135,800	135,900	135,900	135,900	136,100	135,900	135,900	135,900
Sep	132,000	132,000	132,000	132,000	132,100	132,000	132,000	132,000
Oct	130,400	130,300	130,300	130,300	130,400	130,300	130,300	130,300
Nov	126,300	126,200	126,200	126,200	126,400	126,200	126,200	126,200
Dec	121,200	121,200	121,100	121,100	121,300	121,100	121,100	121,100
Average	118,200	117,600	117,400	117,400	117,500	117,400	117,400	117,500
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-700 (-0.7)	-700 (-0.7)	-200 (-0.2)	-700 (-0.7)	-700 (-0.7)	-500 (-0.5)
Feb	---	---	-800 (-0.8)	-800 (-0.8)	-100 (-0.1)	-700 (-0.7)	-800 (-0.8)	-600 (-0.6)
Mar	---	---	-700 (-0.7)	-800 (-0.8)	-100 (-0.1)	-700 (-0.7)	-800 (-0.8)	-600 (-0.6)
Apr	---	---	-500 (-0.5)	-600 (-0.6)	-200 (-0.2)	-500 (-0.5)	-500 (-0.5)	-400 (-0.4)
May	---	---	-100 (-0.1)	-200 (-0.2)	-200 (-0.2)	-100 (-0.1)	-100 (-0.1)	0 (0.0)
Jun	---	---	700 (0.5)	600 (0.5)	-600 (-0.5)	800 (0.6)	700 (0.5)	1,100 (0.9)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	200 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	100 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	100 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	200 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	-100 (-0.1)	-100 (-0.1)	100 (0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Average	---	---	-200 (-0.2)	-200 (-0.2)	-100 (-0.1)	-200 (-0.2)	-200 (-0.2)	-100 (-0.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-1,100 (-1.1)	-1,800 (-1.7)	-1,800 (-1.7)	-1,300 (-1.2)	-1,800 (-1.7)	-1,800 (-1.7)	-1,600 (-1.5)
Feb	---	-1,100 (-1.1)	-1,900 (-1.9)	-1,900 (-1.9)	-1,200 (-1.2)	-1,800 (-1.8)	-1,900 (-1.9)	-1,700 (-1.7)
Mar	---	-1,100 (-1.1)	-1,800 (-1.8)	-1,900 (-1.9)	-1,200 (-1.2)	-1,800 (-1.8)	-1,900 (-1.9)	-1,700 (-1.7)
Apr	---	-1,400 (-1.4)	-1,900 (-1.9)	-2,000 (-2.0)	-1,600 (-1.6)	-1,900 (-1.9)	-1,900 (-1.9)	-1,800 (-1.8)
May	---	-1,700 (-1.7)	-1,800 (-1.8)	-1,900 (-1.9)	-1,900 (-1.9)	-1,800 (-1.8)	-1,800 (-1.8)	-1,700 (-1.7)
Jun	---	-1,200 (-0.9)	-500 (-0.4)	-600 (-0.5)	-1,800 (-1.4)	-400 (-0.3)	-500 (-0.4)	-100 (-0.1)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	100 (0.1)	100 (0.1)	100 (0.1)	300 (0.2)	100 (0.1)	100 (0.1)	100 (0.1)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)	0 (0.0)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Nov	---	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)	100 (0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Dec	---	0 (0.0)	-100 (-0.1)	-100 (-0.1)	100 (0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Average	---	-600 (-0.5)	-800 (-0.7)	-800 (-0.7)	-700 (-0.6)	-800 (-0.7)	-800 (-0.7)	-700 (-0.6)

Table 156. Monthly Storage Contents Dry Year (2004) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	99,100	97,200	97,200	97,200	96,800	97,200	97,200	97,300
Feb	97,500	95,500	95,500	95,500	95,100	95,500	95,500	95,600
Mar	94,800	92,700	92,800	92,800	92,300	92,900	92,800	92,900
Apr	92,300	90,000	90,400	90,400	89,600	90,400	90,400	90,500
May	99,100	97,000	97,600	97,600	96,700	97,600	97,600	97,700
Jun	115,500	114,300	114,700	114,700	114,000	114,700	114,700	114,800
Jul	118,900	117,700	118,000	118,000	117,400	118,000	118,000	118,000
Aug	114,400	112,600	112,900	112,900	112,300	112,800	112,900	112,900
Sep	111,600	109,000	109,300	109,300	108,800	109,300	109,300	109,300
Oct	110,800	108,000	108,300	108,300	107,800	108,200	108,300	108,300
Nov	111,300	108,700	108,900	108,900	108,400	108,800	108,900	108,900
Dec	111,000	108,300	108,500	108,500	108,100	108,500	108,500	108,500
Average	106,400	104,300	104,600	104,600	104,000	104,600	104,600	104,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	-400 (-0.4)	0 (0.0)	0 (0.0)	100 (0.1)
Feb	---	---	0 (0.0)	0 (0.0)	-400 (-0.4)	0 (0.0)	0 (0.0)	100 (0.1)
Mar	---	---	100 (0.1)	100 (0.1)	-400 (-0.4)	200 (0.2)	100 (0.1)	200 (0.2)
Apr	---	---	400 (0.4)	400 (0.4)	-400 (-0.4)	400 (0.4)	400 (0.4)	500 (0.6)
May	---	---	600 (0.6)	600 (0.6)	-300 (-0.3)	600 (0.6)	600 (0.6)	700 (0.7)
Jun	---	---	400 (0.3)	400 (0.3)	-300 (-0.3)	400 (0.3)	400 (0.3)	500 (0.4)
Jul	---	---	300 (0.3)	300 (0.3)	-300 (-0.3)	300 (0.3)	300 (0.3)	300 (0.3)
Aug	---	---	300 (0.3)	300 (0.3)	-300 (-0.3)	200 (0.2)	300 (0.3)	300 (0.3)
Sep	---	---	300 (0.3)	300 (0.3)	-200 (-0.2)	300 (0.3)	300 (0.3)	300 (0.3)
Oct	---	---	300 (0.3)	300 (0.3)	-200 (-0.2)	200 (0.2)	300 (0.3)	300 (0.3)
Nov	---	---	200 (0.2)	200 (0.2)	-300 (-0.3)	100 (0.1)	200 (0.2)	200 (0.2)
Dec	---	---	200 (0.2)	200 (0.2)	-200 (-0.2)	200 (0.2)	200 (0.2)	200 (0.2)
Average	---	---	300 (0.3)	300 (0.3)	-300 (-0.3)	300 (0.3)	300 (0.3)	300 (0.3)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-1,900 (-1.9)	-1,900 (-1.9)	-1,900 (-1.9)	-2,300 (-2.3)	-1,900 (-1.9)	-1,900 (-1.9)	-1,800 (-1.8)
Feb	---	-2,000 (-2.1)	-2,000 (-2.1)	-2,000 (-2.1)	-2,400 (-2.5)	-2,000 (-2.1)	-2,000 (-2.1)	-1,900 (-1.9)
Mar	---	-2,100 (-2.2)	-2,000 (-2.1)	-2,000 (-2.1)	-2,500 (-2.6)	-1,900 (-2.0)	-2,000 (-2.1)	-1,900 (-2.0)
Apr	---	-2,300 (-2.5)	-1,900 (-2.1)	-1,900 (-2.1)	-2,700 (-2.9)	-1,900 (-2.1)	-1,900 (-2.1)	-1,800 (-2.0)
May	---	-2,100 (-2.1)	-1,500 (-1.5)	-1,500 (-1.5)	-2,400 (-2.4)	-1,500 (-1.5)	-1,500 (-1.5)	-1,400 (-1.4)
Jun	---	-1,200 (-1.0)	-800 (-0.7)	-800 (-0.7)	-1,500 (-1.3)	-800 (-0.7)	-800 (-0.7)	-700 (-0.6)
Jul	---	-1,200 (-1.0)	-900 (-0.8)	-900 (-0.8)	-1,500 (-1.3)	-900 (-0.8)	-900 (-0.8)	-900 (-0.8)
Aug	---	-1,800 (-1.6)	-1,500 (-1.3)	-1,500 (-1.3)	-2,100 (-1.8)	-1,600 (-1.4)	-1,500 (-1.3)	-1,500 (-1.3)
Sep	---	-2,600 (-2.3)	-2,300 (-2.1)	-2,300 (-2.1)	-2,800 (-2.5)	-2,300 (-2.1)	-2,300 (-2.1)	-2,300 (-2.1)
Oct	---	-2,800 (-2.5)	-2,500 (-2.3)	-2,500 (-2.3)	-3,000 (-2.7)	-2,600 (-2.3)	-2,500 (-2.3)	-2,500 (-2.3)
Nov	---	-2,600 (-2.3)	-2,400 (-2.2)	-2,400 (-2.2)	-2,900 (-2.6)	-2,500 (-2.2)	-2,400 (-2.2)	-2,400 (-2.2)
Dec	---	-2,700 (-2.4)	-2,500 (-2.3)	-2,500 (-2.3)	-2,900 (-2.6)	-2,500 (-2.3)	-2,500 (-2.3)	-2,500 (-2.3)
Average	---	-2,100 (-2.0)	-1,800 (-1.7)	-1,800 (-1.7)	-2,400 (-2.3)	-1,800 (-1.7)	-1,800 (-1.7)	-1,800 (-1.7)

Table 157. Monthly Storage Contents Overall Average – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	101,500	90,100	89,600	89,800	89,600	89,600	90,200	90,000
Feb	98,700	86,400	86,100	86,300	86,200	86,100	86,400	86,300
Mar	97,100	84,400	83,900	84,100	84,100	84,000	84,300	84,000
Apr	96,100	83,200	82,800	82,900	82,900	82,800	83,100	82,800
May	98,900	87,600	87,300	87,400	87,400	87,400	87,500	87,300
Jun	118,300	110,800	110,800	110,800	110,900	110,800	110,700	110,800
Jul	125,400	120,700	121,000	121,000	120,500	121,100	120,800	120,900
Aug	119,900	116,300	116,600	116,700	116,200	116,600	116,400	116,500
Sep	115,200	110,500	110,700	110,800	110,400	110,700	110,500	110,500
Oct	112,000	104,500	104,300	104,500	104,200	104,300	104,600	104,400
Nov	109,300	99,300	98,900	99,100	99,000	98,900	99,300	99,200
Dec	105,400	94,200	93,800	94,000	93,800	93,800	94,300	94,200
Average	108,200	99,100	98,900	99,000	98,800	98,900	99,100	99,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-500 (-0.6)	-300 (-0.3)	-500 (-0.6)	-500 (-0.6)	100 (0.1)	-100 (-0.1)
Feb	---	---	-300 (-0.3)	-100 (-0.1)	-200 (-0.2)	-300 (-0.3)	0 (0.0)	-100 (-0.1)
Mar	---	---	-500 (-0.6)	-300 (-0.4)	-300 (-0.4)	-400 (-0.5)	-100 (-0.1)	-400 (-0.5)
Apr	---	---	-400 (-0.5)	-300 (-0.4)	-300 (-0.4)	-400 (-0.5)	-100 (-0.1)	-400 (-0.5)
May	---	---	-300 (-0.3)	-200 (-0.2)	-200 (-0.2)	-200 (-0.2)	-100 (-0.1)	-300 (-0.3)
Jun	---	---	0 (0.0)	0 (0.0)	100 (0.1)	0 (0.0)	-100 (-0.1)	0 (0.0)
Jul	---	---	300 (0.2)	300 (0.2)	-200 (-0.2)	400 (0.3)	100 (0.1)	200 (0.2)
Aug	---	---	300 (0.3)	400 (0.3)	-100 (-0.1)	300 (0.3)	100 (0.1)	200 (0.2)
Sep	---	---	200 (0.2)	300 (0.3)	-100 (-0.1)	200 (0.2)	0 (0.0)	0 (0.0)
Oct	---	---	-200 (-0.2)	0 (0.0)	-300 (-0.3)	-200 (-0.2)	100 (0.1)	-100 (-0.1)
Nov	---	---	-400 (-0.4)	-200 (-0.2)	-300 (-0.3)	-400 (-0.4)	0 (0.0)	-100 (-0.1)
Dec	---	---	-400 (-0.4)	-200 (-0.2)	-400 (-0.4)	-400 (-0.4)	100 (0.1)	0 (0.0)
Average	---	---	-200 (-0.2)	-100 (-0.1)	-300 (-0.3)	-200 (-0.2)	0 (0.0)	-100 (-0.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-11,400 (-11.2)	-11,900 (-11.7)	-11,700 (-11.5)	-11,900 (-11.7)	-11,900 (-11.7)	-11,300 (-11.1)	-11,500 (-11.3)
Feb	---	-12,300 (-12.5)	-12,600 (-12.8)	-12,400 (-12.6)	-12,500 (-12.7)	-12,600 (-12.8)	-12,300 (-12.5)	-12,400 (-12.6)
Mar	---	-12,700 (-13.1)	-13,200 (-13.6)	-13,000 (-13.4)	-13,000 (-13.4)	-13,100 (-13.5)	-12,800 (-13.2)	-13,100 (-13.5)
Apr	---	-12,900 (-13.4)	-13,300 (-13.8)	-13,200 (-13.7)	-13,200 (-13.7)	-13,300 (-13.8)	-13,000 (-13.5)	-13,300 (-13.8)
May	---	-11,300 (-11.4)	-11,600 (-11.7)	-11,500 (-11.6)	-11,500 (-11.6)	-11,500 (-11.6)	-11,400 (-11.5)	-11,600 (-11.7)
Jun	---	-7,500 (-6.3)	-7,500 (-6.3)	-7,500 (-6.3)	-7,400 (-6.3)	-7,500 (-6.3)	-7,600 (-6.4)	-7,500 (-6.3)
Jul	---	-4,700 (-3.7)	-4,400 (-3.5)	-4,400 (-3.5)	-4,900 (-3.9)	-4,300 (-3.4)	-4,600 (-3.7)	-4,500 (-3.6)
Aug	---	-3,600 (-3.0)	-3,300 (-2.8)	-3,200 (-2.7)	-3,700 (-3.1)	-3,300 (-2.8)	-3,500 (-2.9)	-3,400 (-2.8)
Sep	---	-4,700 (-4.1)	-4,500 (-3.9)	-4,400 (-3.8)	-4,800 (-4.2)	-4,500 (-3.9)	-4,700 (-4.1)	-4,700 (-4.1)
Oct	---	-7,500 (-6.7)	-7,700 (-6.9)	-7,500 (-6.7)	-7,800 (-7.0)	-7,700 (-6.9)	-7,400 (-6.6)	-7,600 (-6.8)
Nov	---	-10,000 (-9.1)	-10,400 (-9.5)	-10,200 (-9.3)	-10,300 (-9.4)	-10,400 (-9.5)	-10,000 (-9.1)	-10,100 (-9.2)
Dec	---	-11,200 (-10.6)	-11,600 (-11.0)	-11,400 (-10.8)	-11,600 (-11.0)	-11,600 (-11.0)	-11,100 (-10.5)	-11,200 (-10.6)
Average	---	-9,100 (-8.4)	-9,300 (-8.6)	-9,200 (-8.5)	-9,400 (-8.7)	-9,300 (-8.6)	-9,100 (-8.4)	-9,200 (-8.5)

Table 158. Monthly Storage Contents Normal Year (2005) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	107,100	76,100	76,000	75,900	76,100	75,900	76,100	76,100
Feb	102,300	74,800	74,700	74,700	74,800	74,700	74,700	74,700
Mar	98,900	74,600	74,500	74,500	74,500	74,500	74,500	74,500
Apr	93,400	74,400	74,400	74,400	74,400	74,400	74,400	74,400
May	89,400	77,000	76,900	76,900	77,000	76,900	77,000	77,000
Jun	106,200	96,000	95,700	95,700	96,300	95,500	94,800	95,600
Jul	116,800	106,100	105,800	105,700	106,400	105,500	104,700	105,600
Aug	113,500	103,500	103,000	103,000	103,600	102,800	101,900	102,900
Sep	107,700	99,600	99,100	99,000	99,700	98,800	98,000	98,900
Oct	105,800	96,200	95,600	95,500	96,300	95,400	94,800	95,600
Nov	106,300	91,200	89,700	89,700	90,900	89,700	89,500	90,400
Dec	103,000	85,500	84,300	84,100	85,400	84,100	84,000	85,100
Average	104,200	88,000	87,600	87,500	88,000	87,400	87,100	87,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-100 (-0.1)	-200 (-0.3)	0 (0.0)	-200 (-0.3)	0 (0.0)	0 (0.0)
Feb	---	---	-100 (-0.1)	-100 (-0.1)	0 (0.0)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Mar	---	---	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)	-100 (-0.1)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	-100 (-0.1)	-100 (-0.1)	0 (0.0)	-100 (-0.1)	0 (0.0)	0 (0.0)
Jun	---	---	-300 (-0.3)	-300 (-0.3)	300 (0.3)	-500 (-0.5)	-1,200 (-1.3)	-400 (-0.4)
Jul	---	---	-300 (-0.3)	-400 (-0.4)	300 (0.3)	-600 (-0.6)	-1,400 (-1.3)	-500 (-0.5)
Aug	---	---	-500 (-0.5)	-500 (-0.5)	100 (0.1)	-700 (-0.7)	-1,600 (-1.5)	-600 (-0.6)
Sep	---	---	-500 (-0.5)	-600 (-0.6)	100 (0.1)	-800 (-0.8)	-1,600 (-1.6)	-700 (-0.7)
Oct	---	---	-600 (-0.6)	-700 (-0.7)	100 (0.1)	-800 (-0.8)	-1,400 (-1.5)	-600 (-0.6)
Nov	---	---	-1,500 (-1.6)	-1,500 (-1.6)	-300 (-0.3)	-1,500 (-1.6)	-1,700 (-1.9)	-800 (-0.9)
Dec	---	---	-1,200 (-1.4)	-1,400 (-1.6)	-100 (-0.1)	-1,400 (-1.6)	-1,500 (-1.8)	-400 (-0.5)
Average	---	---	-400 (-0.5)	-500 (-0.6)	0 (0.0)	-600 (-0.7)	-900 (-1.0)	-400 (-0.5)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-31,000 (-28.9)	-31,100(-29.0)	-31,200 (-29.1)	-31,000 (-28.9)	-31,200 (-29.1)	-31,000 (-28.9)	-31,000 (-28.9)
Feb	---	-27,500 (-26.9)	-27,600 (-27.0)	-27,600 (-27.0)	-27,500 (-26.9)	-27,600 (-27.0)	-27,600 (-27.0)	-27,600 (-27.0)
Mar	---	-24,300 (-24.6)	-24,400 (-24.7)	-24,400 (-24.7)	-24,400 (-24.7)	-24,400 (-24.7)	-24,400 (-24.7)	-24,400 (-24.7)
Apr	---	-19,000 (-20.3)	-19,000 (-20.3)	-19,000 (-20.3)	-19,000 (-20.3)	-19,000 (-20.3)	-19,000 (-20.3)	-19,000 (-20.3)
May	---	-12,400 (-13.9)	-12,500 (-14.0)	-12,500 (-14.0)	-12,400 (-13.9)	-12,500 (-14.0)	-12,400 (-13.9)	-12,400 (-13.9)
Jun	---	-10,200 (-9.6)	-10,500 (-9.9)	-10,500 (-9.9)	-9,900 (-9.3)	-10,700 (-10.1)	-11,400 (-10.7)	-10,600 (-10.0)
Jul	---	-10,700 (-9.2)	-11,000 (-9.4)	-11,100 (-9.5)	-10,400 (-8.9)	-11,300 (-9.7)	-12,100 (-10.4)	-11,200 (-9.6)
Aug	---	-10,000 (-8.8)	-10,500 (-9.3)	-10,500 (-9.3)	-9,900 (-8.7)	-10,700 (-9.4)	-11,600 (-10.2)	-10,600 (-9.3)
Sep	---	-8,100 (-7.5)	-8,600 (-8.0)	-8,700 (-8.1)	-8,000 (-7.4)	-8,900 (-8.3)	-9,700 (-9.0)	-8,800 (-8.2)
Oct	---	-9,600 (-9.1)	-10,200 (-9.6)	-10,300 (-9.7)	-9,500 (-9.0)	-10,400 (-9.8)	-11,000 (-10.4)	-10,200 (-9.6)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Nov	---	-15,100 (-14.2)	-16,600 (-15.6)	-16,600 (-15.6)	-15,400 (-14.5)	-16,600 (-15.6)	-16,800 (-15.8)	-15,900 (-15.0)
Dec	---	-17,500 (-17.0)	-18,700 (-18.2)	-18,900 (-18.3)	-17,600 (-17.1)	-18,900 (-18.3)	-19,000 (-18.4)	-17,900 (-17.4)
Average	---	-16,200 (-15.5)	-16,600 (-15.9)	-16,700 (-16.0)	-16,200 (-15.5)	-16,800 (-16.1)	-17,100 (-16.4)	-16,600 (-15.9)

Table 159. Monthly Storage Contents Wet Year (1997) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	104,300	88,400	87,700	88,000	88,500	88,000	88,600	88,100
Feb	99,800	87,200	86,800	87,300	87,400	87,300	87,600	87,100
Mar	97,900	86,800	86,500	86,900	87,000	86,900	87,200	86,800
Apr	98,300	85,900	85,300	85,700	86,200	85,600	86,000	85,600
May	101,700	90,300	91,400	91,700	90,600	91,600	92,100	91,800
Jun	129,400	122,200	123,800	124,000	123,000	124,100	124,200	124,300
Jul	140,300	140,500	140,500	140,500	140,500	140,500	140,500	140,500
Aug	135,800	137,800	137,800	137,800	137,700	137,800	137,800	137,600
Sep	132,000	133,000	133,100	133,100	133,000	133,100	133,100	132,900
Oct	130,400	129,900	129,900	129,900	129,900	129,900	130,000	129,800
Nov	126,300	123,400	123,200	123,300	123,400	123,300	123,500	123,300
Dec	121,200	116,200	115,900	116,000	116,200	116,000	116,200	116,100
Average	118,200	112,000	112,000	112,200	112,100	112,200	112,400	112,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-700 (-0.8)	-400 (-0.5)	100 (0.1)	-400 (-0.5)	200 (0.2)	-300 (-0.3)
Feb	---	---	-400 (-0.5)	100 (0.1)	200 (0.2)	100 (0.1)	400 (0.5)	-100 (-0.1)
Mar	---	---	-300 (-0.3)	100 (0.1)	200 (0.2)	100 (0.1)	400 (0.5)	0 (0.0)
Apr	---	---	-600 (-0.7)	-200 (-0.2)	300 (0.3)	-300 (-0.3)	100 (0.1)	-300 (-0.3)
May	---	---	1,100 (1.2)	1,400 (1.6)	300 (0.3)	1,300 (1.4)	1,800 (2.0)	1,500 (1.7)
Jun	---	---	1,600 (1.3)	1,800 (1.5)	800 (0.7)	1,900 (1.6)	2,000 (1.6)	2,100 (1.7)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	-100 (-0.1)	0 (0.0)	0 (0.0)	-200 (-0.1)
Sep	---	---	100 (0.1)	100 (0.1)	0 (0.0)	100 (0.1)	100 (0.1)	-100 (-0.1)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.1)	-100 (-0.1)
Nov	---	---	-200 (-0.2)	-100 (-0.1)	0 (0.0)	-100 (-0.1)	100 (0.1)	-100 (-0.1)
Dec	---	---	-300 (-0.3)	-200 (-0.2)	0 (0.0)	-200 (-0.2)	0 (0.0)	-100 (-0.1)
Average	---	---	0 (0.0)	200 (0.2)	100 (0.1)	200 (0.2)	400 (0.4)	100 (0.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-15,900 (-15.2)	-16,600 (-15.9)	-16,300 (-15.6)	-15,800 (-15.1)	-16,300 (-15.6)	-15,700 (-15.1)	-16,200 (-15.5)
Feb	---	-12,600 (-12.6)	-13,000 (-13.0)	-12,500 (-12.5)	-12,400 (-12.4)	-12,500 (-12.5)	-12,200 (-12.2)	-12,700 (-12.7)
Mar	---	-11,100 (-11.3)	-11,400 (-11.6)	-11,000 (-11.2)	-10,900 (-11.1)	-11,000 (-11.2)	-10,700 (-10.9)	-11,100 (-11.3)
Apr	---	-12,400 (-12.6)	-13,000 (-13.2)	-12,600 (-12.8)	-12,100 (-12.3)	-12,700 (-12.9)	-12,300 (-12.5)	-12,700 (-12.9)
May	---	-11,400 (-11.2)	-10,300 (-10.1)	-10,000 (-9.8)	-11,100 (-10.9)	-10,100 (-9.9)	-9,600 (-9.4)	-9,900 (-9.7)
Jun	---	-7,200 (-5.6)	-5,600 (-4.3)	-5,400 (-4.2)	-6,400 (-4.9)	-5,300 (-4.1)	-5,200 (-4.0)	-5,100 (-3.9)
Jul	---	200 (0.1)	200 (0.1)	200 (0.1)	200 (0.1)	200 (0.1)	200 (0.1)	200 (0.1)
Aug	---	2,000 (1.5)	2,000 (1.5)	2,000 (1.5)	1,900 (1.4)	2,000 (1.5)	2,000 (1.5)	1,800 (1.3)
Sep	---	1,000 (0.8)	1,100 (0.8)	1,100 (0.8)	1,000 (0.8)	1,100 (0.8)	1,100 (0.8)	900 (0.7)
Oct	---	-500 (-0.4)	-500 (-0.4)	-500 (-0.4)	-500 (-0.4)	-500 (-0.4)	-400 (-0.3)	-600 (-0.5)
Nov	---	-2,900 (-2.3)	-3,100 (-2.5)	-3,000 (-2.4)	-2,900 (-2.3)	-3,000 (-2.4)	-2,800 (-2.2)	-3,000 (-2.4)
Dec	---	-5,000 (-4.1)	-5,300 (-4.4)	-5,200 (-4.3)	-5,000 (-4.1)	-5,200 (-4.3)	-5,000 (-4.1)	-5,100 (-4.2)
Average	---	-6,200 (-5.2)	-6,200 (-5.2)	-6,000 (-5.1)	-6,100 (-5.2)	-6,000 (-5.1)	-5,800 (-4.9)	-6,100 (-5.2)

Table 160. Monthly Storage Contents Dry Year (2004) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Contents (ac-ft)														
Jan	99,100	76,200	75,700		75,800		76,200		75,700		76,000		76,000	
Feb	97,500	74,300	74,300		74,300		74,300		74,300		74,300		74,300	
Mar	94,800	74,100	74,100		74,100		74,100		74,100		74,100		74,100	
Apr	92,300	74,000	74,000		74,000		74,000		74,000		74,000		74,000	
May	99,100	82,100	82,100		82,000		82,100		82,000		82,300		82,100	
Jun	115,500	108,000	108,100		108,100		108,000		108,000		108,300		108,000	
Jul	118,900	111,800	111,800		111,900		111,800		111,800		112,000		111,900	
Aug	114,400	105,400	105,400		105,500		105,400		105,400		105,500		105,500	
Sep	111,600	96,200	95,500		95,700		95,800		95,500		96,000		95,800	
Oct	110,800	86,000	84,800		84,900		85,700		84,700		85,900		85,700	
Nov	111,300	79,700	78,500		78,500		79,300		78,400		79,400		79,300	
Dec	111,000	76,400	76,300		76,300		76,300		76,300		76,400		76,300	
Average	106,400	87,100	86,800		86,800		87,000		86,800		87,100		87,000	
Change in Contents Compared to No Action [ac-ft (%)]														
Jan	---	---	-500	(-0.7)	-400	(-0.5)	0	(0.0)	-500	(-0.7)	-200	(-0.3)	-200	(-0.3)
Feb	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	---	0	(0.0)	-100	(-0.1)	0	(0.0)	-100	(-0.1)	200	(0.2)	0	(0.0)
Jun	---	---	100	(0.1)	100	(0.1)	0	(0.0)	0	(0.0)	300	(0.3)	0	(0.0)
Jul	---	---	0	(0.0)	100	(0.1)	0	(0.0)	0	(0.0)	200	(0.2)	100	(0.1)
Aug	---	---	0	(0.0)	100	(0.1)	0	(0.0)	0	(0.0)	100	(0.1)	100	(0.1)
Sep	---	---	-700	(-0.7)	-500	(-0.5)	-400	(-0.4)	-700	(-0.7)	-200	(-0.2)	-400	(-0.4)
Oct	---	---	-1,200	(-1.4)	-1,100	(-1.3)	-300	(-0.3)	-1,300	(-1.5)	-100	(-0.1)	-300	(-0.3)
Nov	---	---	-1,200	(-1.5)	-1,200	(-1.5)	-400	(-0.5)	-1,300	(-1.6)	-300	(-0.4)	-400	(-0.5)
Dec	---	---	-100	(-0.1)	-100	(-0.1)	-100	(-0.1)	-100	(-0.1)	0	(0.0)	-100	(-0.1)
Average	---	---	-300	(-0.3)	-300	(-0.3)	-100	(-0.1)	-300	(-0.3)	0	(0.0)	-100	(-0.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]														
Jan	---	---	-22,900 (-23.1)		-23,400 (-23.6)		-23,300 (-23.5)		-22,900 (-23.1)		-23,400 (-23.6)		-23,100 (-23.3)	
Feb	---	---	-23,200 (-23.8)		-23,200 (-23.8)		-23,200 (-23.8)		-23,200 (-23.8)		-23,200 (-23.8)		-23,200 (-23.8)	
Mar	---	---	-20,700 (-21.8)		-20,700 (-21.8)		-20,700 (-21.8)		-20,700 (-21.8)		-20,700 (-21.8)		-20,700 (-21.8)	
Apr	---	---	-18,300 (-19.8)		-18,300 (-19.8)		-18,300 (-19.8)		-18,300 (-19.8)		-18,300 (-19.8)		-18,300 (-19.8)	
May	---	---	-17,000 (-17.2)		-17,000 (-17.2)		-17,100 (-17.3)		-17,000 (-17.2)		-17,100 (-17.3)		-16,800 (-17.0)	
Jun	---	---	-7,500 (-6.5)		-7,400 (-6.4)		-7,400 (-6.4)		-7,500 (-6.5)		-7,500 (-6.5)		-7,200 (-6.2)	
Jul	---	---	-7,100 (-6.0)		-7,100 (-6.0)		-7,000 (-5.9)		-7,100 (-6.0)		-7,100 (-6.0)		-6,900 (-5.8)	
Aug	---	---	-9,000 (-7.9)		-9,000 (-7.9)		-8,900 (-7.8)		-9,000 (-7.9)		-9,000 (-7.9)		-8,900 (-7.8)	
Sep	---	---	-15,400 (-13.8)		-16,100 (-14.4)		-15,900 (-14.2)		-15,800 (-14.2)		-16,100 (-14.4)		-15,600 (-14.0)	
Oct	---	---	-24,800 (-22.4)		-26,000 (-23.5)		-25,900 (-23.4)		-25,100 (-22.7)		-26,100 (-23.6)		-24,900 (-22.5)	

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Nov	---	---	-31,600 (-28.4)	-32,800 (-29.5)	-32,800 (-29.5)	-32,000 (-28.8)	-32,900 (-29.6)	-31,900 (-28.7)
Dec	---	---	-34,600 (-31.2)	-34,700 (-31.3)	-34,700 (-31.3)	-34,700 (-31.3)	-34,700 (-31.3)	-34,600 (-31.2)
Average	---	---	-19,300 (-18.1)	-19,600 (-18.4)	-19,600 (-18.4)	-19,400 (-18.2)	-19,600 (-18.4)	-19,300 (-18.1)

A time-series plot of simulated storage contents for each of the alternatives is shown in Figure 30. In general, all alternatives follow the same general pattern of annual drawdown and annual filling.

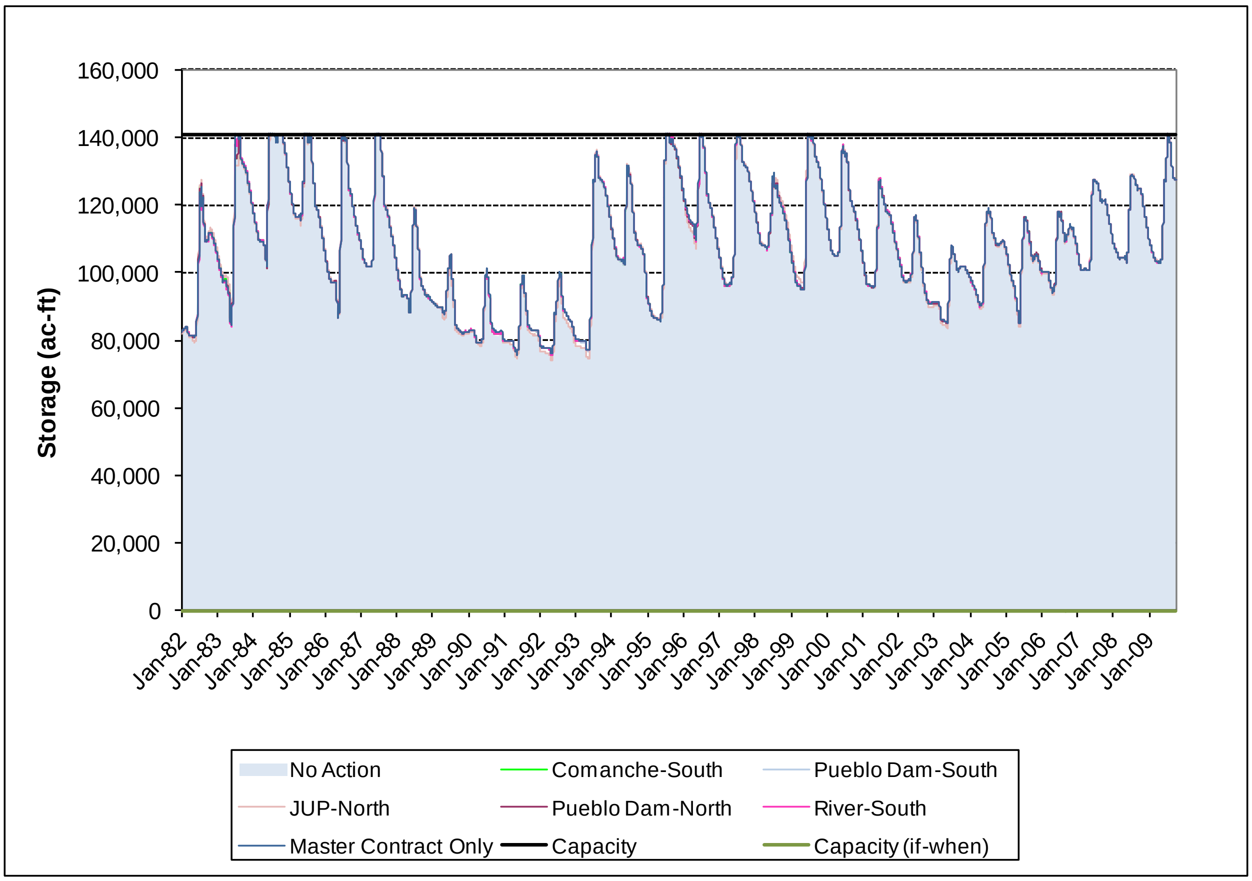

Figure 30. Storage Time-Series Analysis - Twin Lakes Reservoir (Direct Effects).

A time series plot is for the Cumulative Effects analysis in Twin Lakes Reservoir is presented in Figure 31. Differences among alternatives are similar to the direct effects analysis. With respect to climate change, it is assumed that Twin Lakes Reservoir would have more storage in the winter and spring months due to increased winter precipitation as rain and earlier snow melt runoff. Also, because more extreme precipitation and drought events are anticipated, the reservoir would likely be fuller during wet periods and less full during dry periods than is currently shown for cumulative effects.

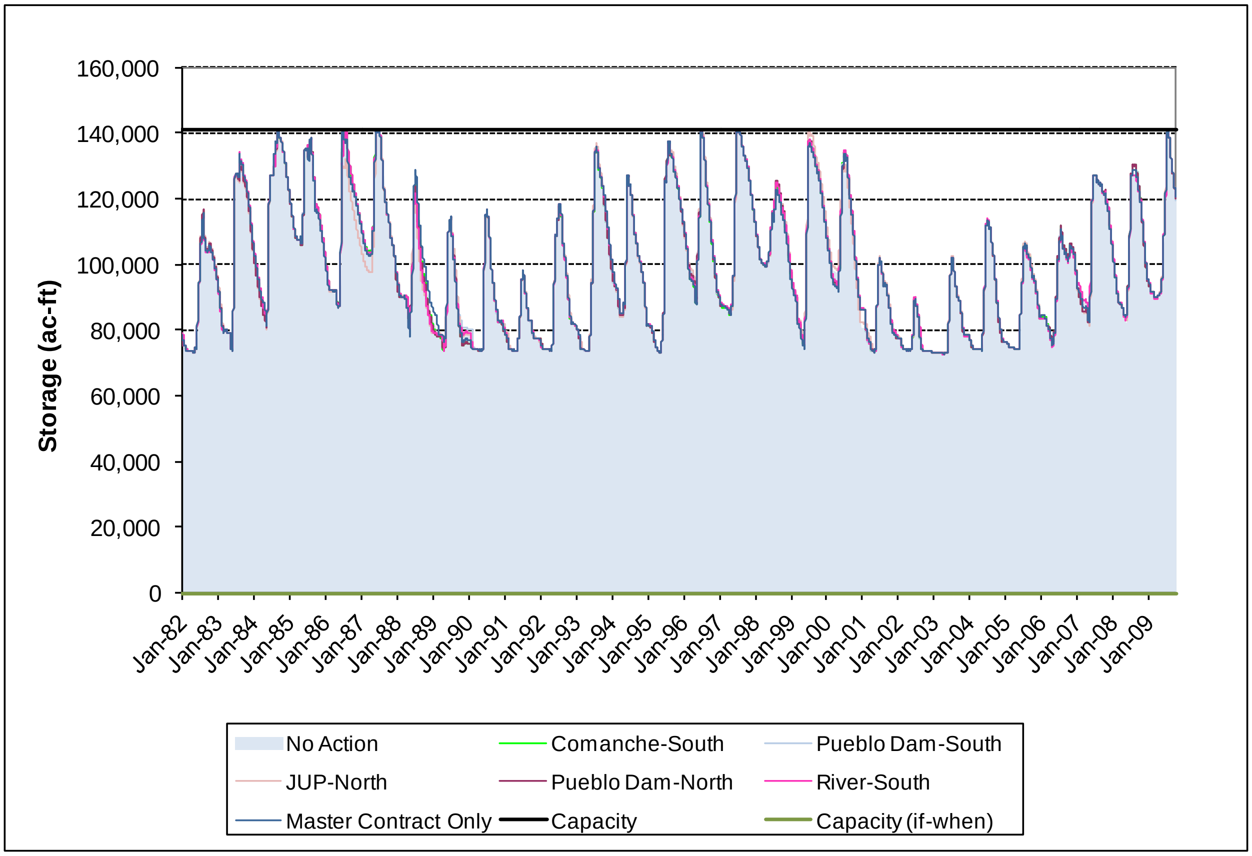

Figure 31. Storage Time-Series Analysis - Twin Lakes Reservoir (Cumulative Effects).

Simulated water surface elevation for Twin Lakes Reservoir is presented in Table 161 through Table 164 for the direct effects analysis, and Table 165 through Table 168 for the cumulative effects analysis. Simulated surface area for Twin Lakes Reservoir is presented in Table 169 through Table 172 for the direct effects analysis, and Table 173 through Table 176 for the cumulative effects analysis.

Table 161. Monthly Water Surface Elevation Overall Average – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,183.5	9,182.9	9,183.0	9,183.0	9,182.9	9,183.0	9,183.0	9,183.0
Feb	9,182.2	9,181.6	9,181.7	9,181.7	9,181.6	9,181.7	9,181.7	9,181.7
Mar	9,181.4	9,180.8	9,180.9	9,180.9	9,180.8	9,180.9	9,180.9	9,180.9
Apr	9,180.9	9,180.2	9,180.4	9,180.4	9,180.3	9,180.4	9,180.4	9,180.5
May	9,182.1	9,181.4	9,181.7	9,181.6	9,181.4	9,181.7	9,181.7	9,181.7
Jun	9,190.8	9,190.3	9,190.5	9,190.4	9,190.3	9,190.5	9,190.5	9,190.5
Jul	9,193.8	9,193.4	9,193.5	9,193.5	9,193.4	9,193.5	9,193.5	9,193.6
Aug	9,191.4	9,191.0	9,191.1	9,191.1	9,191.0	9,191.1	9,191.1	9,191.1
Sep	9,189.4	9,188.9	9,189.0	9,189.0	9,188.9	9,189.0	9,189.0	9,189.0
Oct	9,188.1	9,187.4	9,187.5	9,187.5	9,187.5	9,187.5	9,187.5	9,187.5
Nov	9,186.9	9,186.3	9,186.4	9,186.4	9,186.3	9,186.4	9,186.4	9,186.4
Dec	9,185.2	9,184.7	9,184.7	9,184.7	9,184.7	9,184.7	9,184.7	9,184.8
Average	9,186.3	9,185.7	9,185.9	9,185.9	9,185.8	9,185.9	9,185.9	9,185.9
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Feb	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Mar	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Apr	---	---	0.2 (0.3)	0.2 (0.3)	0.1 (0.1)	0.2 (0.3)	0.2 (0.3)	0.2 (0.3)
May	---	---	0.2 (0.2)	0.2 (0.2)	0.0 (0.0)	0.3 (0.4)	0.2 (0.2)	0.3 (0.4)
Jun	---	---	0.2 (0.2)	0.1 (0.1)	0.0 (0.0)	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)
Jul	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.2 (0.2)
Aug	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Sep	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Oct	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Nov	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)
Average	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.2)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)
Feb	---	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)
Mar	---	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)
Apr	---	-0.7 (-0.9)	-0.5 (-0.6)	-0.5 (-0.6)	-0.6 (-0.8)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)
May	---	-0.7 (-0.9)	-0.5 (-0.6)	-0.5 (-0.6)	-0.7 (-0.9)	-0.4 (-0.5)	-0.5 (-0.6)	-0.4 (-0.5)
Jun	---	-0.5 (-0.6)	-0.3 (-0.3)	-0.4 (-0.4)	-0.5 (-0.6)	-0.3 (-0.3)	-0.3 (-0.3)	-0.3 (-0.3)
Jul	---	-0.4 (-0.4)	-0.3 (-0.3)	-0.3 (-0.3)	-0.4 (-0.4)	-0.3 (-0.3)	-0.3 (-0.3)	-0.2 (-0.2)
Aug	---	-0.4 (-0.4)	-0.3 (-0.3)	-0.3 (-0.3)	-0.4 (-0.4)	-0.3 (-0.3)	-0.3 (-0.3)	-0.3 (-0.3)
Sep	---	-0.5 (-0.6)	-0.4 (-0.5)	-0.4 (-0.5)	-0.5 (-0.6)	-0.4 (-0.5)	-0.4 (-0.5)	-0.4 (-0.5)
Oct	---	-0.7 (-0.8)	-0.6 (-0.7)	-0.6 (-0.7)	-0.7 (-0.8)	-0.6 (-0.7)	-0.6 (-0.7)	-0.6 (-0.7)
Nov	---	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.6 (-0.7)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)
Dec	---	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)	-0.5 (-0.6)	-0.4 (-0.5)
Average	---	-0.6 (-0.7)	-0.5 (-0.5)	-0.5 (-0.5)	-0.6 (-0.7)	-0.4 (-0.5)	-0.5 (-0.5)	-0.4 (-0.5)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 162. Monthly Water Surface Elevation Normal Year (2005) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,186.3	9,185.1	9,185.2	9,185.2	9,185.0	9,185.2	9,185.2	9,185.2
Feb	9,184.1	9,182.8	9,182.9	9,182.9	9,182.7	9,182.9	9,182.9	9,182.9
Mar	9,182.4	9,181.4	9,181.5	9,181.5	9,181.2	9,181.5	9,181.5	9,181.5
Apr	9,179.7	9,178.6	9,178.9	9,178.9	9,178.4	9,178.9	9,178.9	9,178.9
May	9,177.7	9,176.4	9,176.9	9,176.9	9,176.2	9,176.9	9,176.9	9,176.9
Jun	9,185.9	9,185.0	9,185.2	9,185.2	9,184.9	9,185.3	9,185.2	9,185.3
Jul	9,190.6	9,190.0	9,190.2	9,190.2	9,190.0	9,190.2	9,190.1	9,190.1
Aug	9,189.1	9,188.3	9,188.7	9,188.8	9,188.4	9,188.7	9,188.5	9,188.6
Sep	9,186.6	9,185.5	9,186.1	9,186.2	9,185.6	9,186.1	9,185.9	9,186.0
Oct	9,185.7	9,184.6	9,185.2	9,185.2	9,184.7	9,185.2	9,185.0	9,185.0
Nov	9,185.9	9,184.9	9,185.4	9,185.5	9,185.0	9,185.4	9,185.2	9,185.3
Dec	9,184.4	9,183.3	9,183.9	9,183.9	9,183.4	9,183.9	9,183.7	9,183.7
Average	9,184.9	9,183.8	9,184.2	9,184.2	9,183.8	9,184.2	9,184.1	9,184.1
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Feb	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Mar	---	---	0.1 (0.2)	0.1 (0.2)	-0.1 (-0.2)	0.1 (0.2)	0.1 (0.2)	0.2 (0.2)
Apr	---	---	0.3 (0.4)	0.3 (0.4)	-0.2 (-0.2)	0.3 (0.4)	0.3 (0.4)	0.3 (0.4)
May	---	---	0.5 (0.6)	0.5 (0.6)	-0.2 (-0.2)	0.5 (0.6)	0.5 (0.6)	0.5 (0.7)
Jun	---	---	0.3 (0.3)	0.3 (0.3)	-0.1 (-0.1)	0.3 (0.3)	0.2 (0.2)	0.3 (0.4)
Jul	---	---	0.2 (0.3)	0.3 (0.3)	0.1 (0.1)	0.3 (0.3)	0.1 (0.1)	0.1 (0.2)
Aug	---	---	0.4 (0.5)	0.5 (0.5)	0.1 (0.1)	0.4 (0.5)	0.3 (0.3)	0.3 (0.3)
Sep	---	---	0.6 (0.7)	0.7 (0.8)	0.1 (0.1)	0.6 (0.8)	0.5 (0.5)	0.5 (0.6)
Oct	---	---	0.6 (0.7)	0.7 (0.8)	0.1 (0.1)	0.6 (0.8)	0.5 (0.6)	0.5 (0.6)
Nov	---	---	0.5 (0.6)	0.6 (0.7)	0.1 (0.1)	0.5 (0.7)	0.4 (0.4)	0.4 (0.5)
Dec	---	---	0.5 (0.6)	0.6 (0.7)	0.1 (0.1)	0.5 (0.7)	0.4 (0.4)	0.4 (0.5)
Average	---	---	0.4 (0.4)	0.4 (0.5)	0.0 (0.0)	0.4 (0.4)	0.3 (0.3)	0.3 (0.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-1.2 (-1.4)	-1.1 (-1.3)	-1.1 (-1.3)	-1.3 (-1.5)	-1.1 (-1.3)	-1.1 (-1.3)	-1.1 (-1.3)
Feb	---	-1.3 (-1.5)	-1.2 (-1.4)	-1.2 (-1.4)	-1.4 (-1.6)	-1.2 (-1.4)	-1.2 (-1.4)	-1.1 (-1.4)
Mar	---	-1.1 (-1.3)	-0.9 (-1.2)	-0.9 (-1.2)	-1.2 (-1.5)	-0.9 (-1.2)	-0.9 (-1.2)	-0.9 (-1.1)
Apr	---	-1.2 (-1.5)	-0.9 (-1.1)	-0.9 (-1.1)	-1.3 (-1.7)	-0.8 (-1.1)	-0.9 (-1.1)	-0.8 (-1.0)
May	---	-1.3 (-1.7)	-0.9 (-1.1)	-0.9 (-1.1)	-1.5 (-1.9)	-0.8 (-1.1)	-0.9 (-1.1)	-0.8 (-1.0)
Jun	---	-0.9 (-1.0)	-0.6 (-0.7)	-0.6 (-0.7)	-1.0 (-1.1)	-0.6 (-0.7)	-0.7 (-0.8)	-0.6 (-0.7)
Jul	---	-0.6 (-0.7)	-0.4 (-0.4)	-0.3 (-0.4)	-0.5 (-0.6)	-0.4 (-0.4)	-0.5 (-0.6)	-0.5 (-0.5)
Aug	---	-0.8 (-1.0)	-0.4 (-0.5)	-0.4 (-0.4)	-0.7 (-0.8)	-0.4 (-0.5)	-0.6 (-0.7)	-0.5 (-0.6)
Sep	---	-1.1 (-1.3)	-0.5 (-0.6)	-0.4 (-0.5)	-1.0 (-1.1)	-0.4 (-0.5)	-0.6 (-0.7)	-0.6 (-0.7)
Oct	---	-1.2 (-1.4)	-0.5 (-0.6)	-0.5 (-0.6)	-1.0 (-1.2)	-0.5 (-0.6)	-0.7 (-0.8)	-0.7 (-0.8)
Nov	---	-1.0 (-1.2)	-0.5 (-0.6)	-0.5 (-0.6)	-0.9 (-1.1)	-0.5 (-0.6)	-0.7 (-0.8)	-0.7 (-0.8)
Dec	---	-1.1 (-1.3)	-0.6 (-0.7)	-0.5 (-0.6)	-1.0 (-1.2)	-0.5 (-0.6)	-0.7 (-0.9)	-0.7 (-0.8)
Average	---	-1.1 (-1.3)	-0.7 (-0.8)	-0.7 (-0.8)	-1.1 (-1.3)	-0.7 (-0.8)	-0.8 (-0.9)	-0.7 (-0.9)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 163. Monthly Water Surface Elevation Wet Year (1997) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	9,185.0	9,184.5		9,184.2		9,184.1		9,184.4		9,184.2		9,184.2		9,184.2	
Feb	9,182.9	9,182.3		9,182.0		9,182.0		9,182.3		9,182.0		9,182.0		9,182.1	
Mar	9,182.0	9,181.4		9,181.1		9,181.1		9,181.4		9,181.1		9,181.1		9,181.2	
Apr	9,182.1	9,181.4		9,181.2		9,181.2		9,181.4		9,181.2		9,181.2		9,181.3	
May	9,183.8	9,182.9		9,182.9		9,182.9		9,182.9		9,182.9		9,182.9		9,182.9	
Jun	9,195.5	9,195.0		9,195.2		9,195.2		9,194.7		9,195.3		9,195.2		9,195.4	
Jul	9,199.8	9,199.8		9,199.8		9,199.8		9,199.8		9,199.8		9,199.8		9,199.8	
Aug	9,198.0	9,198.1		9,198.1		9,198.1		9,198.1		9,198.1		9,198.1		9,198.1	
Sep	9,196.5	9,196.5		9,196.5		9,196.5		9,196.6		9,196.5		9,196.5		9,196.5	
Oct	9,195.9	9,195.9		9,195.9		9,195.9		9,195.9		9,195.9		9,195.9		9,195.9	
Nov	9,194.3	9,194.3		9,194.3		9,194.3		9,194.3		9,194.3		9,194.3		9,194.3	
Dec	9,192.3	9,192.3		9,192.3		9,192.3		9,192.3		9,192.3		9,192.3		9,192.3	
Average	9,190.7	9,190.4		9,190.3		9,190.3		9,190.3		9,190.3		9,190.3		9,190.3	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		-0.3	(-0.4)	-0.4	(-0.5)	-0.1	(-0.1)	-0.3	(-0.4)	-0.4	(-0.5)	-0.3	(-0.4)
Feb	---	---		-0.3	(-0.4)	-0.3	(-0.4)	0.0	(0.0)	-0.3	(-0.4)	-0.3	(-0.4)	-0.2	(-0.2)
Mar	---	---		-0.3	(-0.4)	-0.4	(-0.5)	0.0	(0.0)	-0.3	(-0.4)	-0.3	(-0.4)	-0.3	(-0.4)
Apr	---	---		-0.2	(-0.2)	-0.2	(-0.2)	0.0	(0.0)	-0.2	(-0.2)	-0.2	(-0.2)	-0.1	(-0.1)
May	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Jun	---	---		0.2	(0.2)	0.2	(0.2)	-0.3	(-0.3)	0.2	(0.2)	0.2	(0.2)	0.4	(0.4)
Jul	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Aug	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Sep	---	---		0.0	(0.0)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Oct	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Nov	---	---		0.0	(0.0)	-0.1	(-0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.1)
Dec	---	---		0.0	(0.0)	-0.1	(-0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Average	---	---		-0.1	(-0.1)	-0.1	(-0.1)	0.0	(0.0)	-0.1	(-0.1)	-0.1	(-0.1)	0.0	(-0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-0.5	(-0.6)	-0.8	(-1.0)	-0.9	(-1.1)	-0.6	(-0.7)	-0.8	(-1.0)	-0.9	(-1.1)	-0.8	(-1.0)
Feb	---	-0.6	(-0.7)	-0.9	(-1.1)	-0.9	(-1.1)	-0.6	(-0.7)	-0.9	(-1.1)	-0.9	(-1.1)	-0.8	(-1.0)
Mar	---	-0.6	(-0.7)	-0.9	(-1.1)	-1.0	(-1.2)	-0.6	(-0.7)	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)
Apr	---	-0.7	(-0.9)	-0.9	(-1.1)	-0.9	(-1.1)	-0.7	(-0.9)	-0.9	(-1.1)	-0.9	(-1.1)	-0.8	(-1.0)
May	---	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)	-0.9	(-1.1)
Jun	---	-0.5	(-0.5)	-0.3	(-0.3)	-0.3	(-0.3)	-0.8	(-0.8)	-0.3	(-0.3)	-0.3	(-0.3)	-0.1	(-0.1)
Jul	---	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Aug	---	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)
Sep	---	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Oct	---	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Nov	---	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.1)
Dec	---	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Average	---	-0.3	(-0.3)	-0.4	(-0.4)	-0.4	(-0.5)	-0.3	(-0.4)	-0.4	(-0.4)	-0.4	(-0.4)	-0.4	(-0.4)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 164. Monthly Water Surface Elevation Dry Year (2004) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,182.5	9,181.6	9,181.6	9,181.6	9,181.4	9,181.6	9,181.6	9,181.6
Feb	9,181.7	9,180.8	9,180.8	9,180.8	9,180.6	9,180.8	9,180.8	9,180.8
Mar	9,180.4	9,179.4	9,179.5	9,179.5	9,179.2	9,179.5	9,179.5	9,179.5
Apr	9,179.2	9,178.0	9,178.2	9,178.2	9,177.8	9,178.2	9,178.2	9,178.3
May	9,182.5	9,181.5	9,181.8	9,181.7	9,181.3	9,181.8	9,181.8	9,181.8
Jun	9,190.0	9,189.5	9,189.7	9,189.7	9,189.4	9,189.7	9,189.7	9,189.7
Jul	9,191.4	9,190.9	9,191.0	9,191.0	9,190.8	9,191.0	9,191.0	9,191.0
Aug	9,189.6	9,188.7	9,188.9	9,188.9	9,188.6	9,188.9	9,188.9	9,188.9
Sep	9,188.3	9,187.2	9,187.3	9,187.3	9,187.0	9,187.3	9,187.3	9,187.3
Oct	9,187.9	9,186.7	9,186.8	9,186.8	9,186.6	9,186.8	9,186.8	9,186.8
Nov	9,188.2	9,187.0	9,187.1	9,187.1	9,186.9	9,187.1	9,187.1	9,187.1
Dec	9,188.0	9,186.8	9,186.9	9,186.9	9,186.7	9,186.9	9,186.9	9,186.9
Average	9,185.8	9,184.8	9,185.0	9,185.0	9,184.7	9,185.0	9,185.0	9,185.0
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.0 (0.0)	-0.2 (-0.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	-0.2 (-0.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.0 (0.0)	0.1 (0.1)	-0.2 (-0.3)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Apr	---	---	0.2 (0.3)	0.2 (0.3)	-0.2 (-0.3)	0.2 (0.3)	0.2 (0.3)	0.3 (0.4)
May	---	---	0.2 (0.2)	0.2 (0.2)	-0.2 (-0.2)	0.3 (0.4)	0.3 (0.4)	0.3 (0.4)
Jun	---	---	0.2 (0.2)	0.2 (0.2)	-0.1 (-0.1)	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)
Jul	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Aug	---	---	0.2 (0.2)	0.2 (0.2)	-0.1 (-0.1)	0.1 (0.1)	0.2 (0.2)	0.2 (0.2)
Sep	---	---	0.2 (0.2)	0.2 (0.2)	-0.1 (-0.1)	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)
Oct	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Nov	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Dec	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Average	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.2)	0.1 (0.1)	0.1 (0.2)	0.1 (0.2)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.9 (-1.1)	-0.9 (-1.1)	-0.9 (-1.1)	-1.1 (-1.3)	-0.9 (-1.1)	-0.9 (-1.1)	-0.9 (-1.1)
Feb	---	-0.9 (-1.1)	-0.9 (-1.1)	-0.9 (-1.1)	-1.1 (-1.4)	-0.9 (-1.1)	-0.9 (-1.1)	-0.9 (-1.1)
Mar	---	-1.0 (-1.3)	-1.0 (-1.3)	-0.9 (-1.1)	-1.2 (-1.5)	-0.9 (-1.1)	-0.9 (-1.1)	-0.9 (-1.1)
Apr	---	-1.2 (-1.5)	-1.0 (-1.3)	-1.0 (-1.3)	-1.4 (-1.8)	-1.0 (-1.3)	-1.0 (-1.3)	-0.9 (-1.2)
May	---	-1.0 (-1.2)	-0.8 (-1.0)	-0.8 (-1.0)	-1.2 (-1.5)	-0.7 (-0.9)	-0.7 (-0.9)	-0.7 (-0.9)
Jun	---	-0.5 (-0.6)	-0.3 (-0.3)	-0.3 (-0.3)	-0.6 (-0.7)	-0.3 (-0.3)	-0.3 (-0.3)	-0.3 (-0.3)
Jul	---	-0.5 (-0.6)	-0.4 (-0.4)	-0.4 (-0.4)	-0.6 (-0.7)	-0.4 (-0.4)	-0.4 (-0.4)	-0.4 (-0.4)
Aug	---	-0.8 (-0.9)	-0.6 (-0.7)	-0.6 (-0.7)	-0.9 (-1.0)	-0.7 (-0.8)	-0.6 (-0.7)	-0.6 (-0.7)
Sep	---	-1.2 (-1.4)	-1.0 (-1.1)	-1.0 (-1.1)	-1.3 (-1.5)	-1.0 (-1.1)	-1.0 (-1.1)	-1.0 (-1.1)
Oct	---	-1.2 (-1.4)	-1.1 (-1.3)	-1.1 (-1.3)	-1.3 (-1.5)	-1.1 (-1.3)	-1.1 (-1.3)	-1.1 (-1.3)
Nov	---	-1.2 (-1.4)	-1.1 (-1.3)	-1.1 (-1.3)	-1.3 (-1.5)	-1.1 (-1.3)	-1.1 (-1.3)	-1.1 (-1.3)
Dec	---	-1.2 (-1.4)	-1.1 (-1.3)	-1.1 (-1.3)	-1.3 (-1.5)	-1.1 (-1.3)	-1.1 (-1.3)	-1.1 (-1.3)
Average	---	-1.0 (-1.1)	-0.9 (-1.0)	-0.8 (-1.0)	-1.1 (-1.3)	-0.8 (-1.0)	-0.8 (-1.0)	-0.8 (-1.0)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 165. Monthly Surface Water Elevation Overall Average – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Water Elevation (ft)								
Jan	9,183.5	9,177.8	9,177.5	9,177.6	9,177.5	9,177.5	9,177.8	9,177.8
Feb	9,182.2	9,175.9	9,175.7	9,175.8	9,175.9	9,175.8	9,175.9	9,175.9
Mar	9,181.4	9,174.9	9,174.7	9,174.7	9,174.8	9,174.7	9,174.8	9,174.7
Apr	9,180.9	9,174.3	9,174.0	9,174.1	9,174.1	9,174.0	9,174.2	9,174.1
May	9,182.1	9,176.4	9,176.3	9,176.3	9,176.3	9,176.3	9,176.4	9,176.3
Jun	9,190.8	9,187.5	9,187.5	9,187.5	9,187.5	9,187.5	9,187.5	9,187.5
Jul	9,193.8	9,191.8	9,191.9	9,191.9	9,191.7	9,191.9	9,191.8	9,191.9
Aug	9,191.4	9,189.8	9,189.9	9,190.0	9,189.8	9,189.9	9,189.9	9,189.9
Sep	9,189.4	9,187.3	9,187.3	9,187.4	9,187.2	9,187.4	9,187.3	9,187.3
Oct	9,188.1	9,184.5	9,184.4	9,184.5	9,184.4	9,184.4	9,184.6	9,184.5
Nov	9,186.9	9,182.1	9,181.9	9,182.1	9,182.0	9,181.9	9,182.1	9,182.1
Dec	9,185.2	9,179.8	9,179.6	9,179.7	9,179.6	9,179.5	9,179.8	9,179.8
Average	9,186.3	9,181.8	9,181.7	9,181.8	9,181.7	9,181.7	9,181.8	9,181.8
Change in Surface Water Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.3 (-0.4)	-0.2 (-0.3)	-0.3 (-0.4)	-0.3 (-0.4)	0.0 (0.0)	0.0 (0.0)
Feb	---	---	-0.2 (-0.3)	-0.1 (-0.1)	-0.1 (-0.1)	-0.2 (-0.3)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	-0.2 (-0.3)	-0.2 (-0.3)	-0.2 (-0.3)	-0.2 (-0.3)	-0.1 (-0.1)	-0.2 (-0.3)
Apr	---	---	-0.3 (-0.4)	-0.2 (-0.3)	-0.2 (-0.3)	-0.3 (-0.4)	-0.1 (-0.1)	-0.2 (-0.3)
May	---	---	-0.1 (-0.1)	-0.1 (-0.1)	-0.1 (-0.1)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.1)	0.0 (0.0)
Jul	---	---	0.1 (0.1)	0.1 (0.1)	-0.1 (-0.1)	0.1 (0.1)	0.0 (0.0)	0.1 (0.1)
Aug	---	---	0.1 (0.1)	0.2 (0.2)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
Sep	---	---	0.0 (0.0)	0.1 (0.1)	-0.1 (-0.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)	-0.1 (-0.1)	0.1 (0.1)	0.0 (0.0)
Nov	---	---	-0.2 (-0.2)	0.0 (0.0)	-0.1 (-0.1)	-0.2 (-0.2)	0.0 (0.0)	0.0 (0.0)
Dec	---	---	-0.2 (-0.3)	-0.1 (-0.1)	-0.2 (-0.3)	-0.3 (-0.4)	0.0 (0.0)	0.0 (0.0)
Average	---	---	-0.1 (-0.1)	0.0 (-0.1)	-0.1 (-0.2)	-0.1 (-0.2)	0.0 (0.0)	0.0 (0.0)
Change in Surface Water Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-5.7 (-6.9)	-6.0 (-7.3)	-5.9 (-7.2)	-6.0 (-7.3)	-6.0 (-7.3)	-5.7 (-6.9)	-5.7 (-6.9)
Feb	---	-6.3 (-7.8)	-6.5 (-8.0)	-6.4 (-7.9)	-6.4 (-7.9)	-6.5 (-8.0)	-6.3 (-7.8)	-6.3 (-7.8)
Mar	---	-6.5 (-8.1)	-6.7 (-8.3)	-6.7 (-8.3)	-6.7 (-8.3)	-6.7 (-8.3)	-6.6 (-8.2)	-6.7 (-8.3)
Apr	---	-6.6 (-8.3)	-6.9 (-8.6)	-6.8 (-8.5)	-6.8 (-8.5)	-6.9 (-8.6)	-6.7 (-8.4)	-6.8 (-8.5)
May	---	-5.7 (-7.0)	-5.8 (-7.2)	-5.8 (-7.2)	-5.8 (-7.2)	-5.8 (-7.2)	-5.7 (-7.0)	-5.8 (-7.2)
Jun	---	-3.3 (-3.7)	-3.3 (-3.7)	-3.3 (-3.7)	-3.3 (-3.7)	-3.3 (-3.7)	-3.4 (-3.8)	-3.3 (-3.7)
Jul	---	-2.0 (-2.2)	-1.9 (-2.0)	-1.9 (-2.0)	-2.1 (-2.3)	-1.9 (-2.0)	-2.0 (-2.2)	-1.9 (-2.0)
Aug	---	-1.6 (-1.8)	-1.5 (-1.7)	-1.4 (-1.5)	-1.6 (-1.8)	-1.5 (-1.7)	-1.5 (-1.7)	-1.5 (-1.7)
Sep	---	-2.1 (-2.4)	-2.1 (-2.4)	-2.0 (-2.3)	-2.2 (-2.5)	-2.1 (-2.4)	-2.1 (-2.4)	-2.1 (-2.4)
Oct	---	-3.6 (-4.1)	-3.7 (-4.2)	-3.6 (-4.1)	-3.7 (-4.2)	-3.7 (-4.2)	-3.5 (-4.0)	-3.6 (-4.1)
Nov	---	-4.8 (-5.6)	-5.0 (-5.8)	-4.8 (-5.6)	-4.9 (-5.7)	-5.0 (-5.8)	-4.8 (-5.6)	-4.8 (-5.6)
Dec	---	-5.4 (-6.4)	-5.6 (-6.7)	-5.5 (-6.5)	-5.6 (-6.7)	-5.7 (-6.8)	-5.4 (-6.4)	-5.4 (-6.4)
Average	---	-4.5 (-5.2)	-4.6 (-5.4)	-4.5 (-5.3)	-4.6 (-5.4)	-4.6 (-5.4)	-4.5 (-5.2)	-4.5 (-5.3)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 166. Monthly Water Surface Elevation Normal Year (2005) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	9,186.3	9,170.5		9,170.5		9,170.4		9,170.5		9,170.4		9,170.5		9,170.5	
Feb	9,184.1	9,169.8		9,169.7		9,169.7		9,169.8		9,169.7		9,169.7		9,169.7	
Mar	9,182.4	9,169.6		9,169.6		9,169.6		9,169.6		9,169.6		9,169.6		9,169.6	
Apr	9,179.7	9,169.6		9,169.5		9,169.5		9,169.5		9,169.5		9,169.5		9,169.5	
May	9,177.7	9,171.0		9,171.0		9,170.9		9,171.0		9,171.0		9,171.0		9,171.0	
Jun	9,185.9	9,181.0		9,180.8		9,180.8		9,181.1		9,180.7		9,180.4		9,180.8	
Jul	9,190.6	9,185.8		9,185.7		9,185.7		9,186.0		9,185.6		9,185.2		9,185.6	
Aug	9,189.1	9,184.6		9,184.4		9,184.4		9,184.7		9,184.3		9,183.9		9,184.3	
Sep	9,186.6	9,182.8		9,182.5		9,182.5		9,182.8		9,182.4		9,182.0		9,182.4	
Oct	9,185.7	9,181.1		9,180.8		9,180.8		9,181.2		9,180.7		9,180.5		9,180.9	
Nov	9,185.9	9,178.6		9,177.9		9,177.9		9,178.5		9,177.9		9,177.8		9,178.2	
Dec	9,184.4	9,175.7		9,175.1		9,174.9		9,175.6		9,174.9		9,174.9		9,175.5	
Average	9,184.9	9,176.7		9,176.5		9,176.4		9,176.7		9,176.4		9,176.3		9,176.5	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		-0.1	(-0.1)	-0.1	(-0.2)	0.0	(0.0)	-0.1	(-0.1)	0.0	(0.0)	0.0	(0.0)
Feb	---	---		-0.1	(-0.1)	-0.1	(-0.1)	0.0	(0.0)	-0.1	(-0.1)	0.0	(-0.1)	0.0	(0.0)
Mar	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Apr	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
May	---	---		0.0	(-0.1)	0.0	(-0.1)	0.0	(0.0)	0.0	(-0.1)	0.0	(0.0)	0.0	(0.0)
Jun	---	---		-0.1	(-0.2)	-0.1	(-0.2)	0.1	(0.2)	-0.3	(-0.3)	-0.6	(-0.7)	-0.2	(-0.3)
Jul	---	---		-0.1	(-0.2)	-0.2	(-0.2)	0.1	(0.2)	-0.3	(-0.3)	-0.6	(-0.7)	-0.2	(-0.3)
Aug	---	---		-0.2	(-0.3)	-0.2	(-0.3)	0.1	(0.1)	-0.3	(-0.4)	-0.7	(-0.9)	-0.3	(-0.4)
Sep	---	---		-0.2	(-0.3)	-0.3	(-0.3)	0.1	(0.1)	-0.4	(-0.5)	-0.7	(-0.9)	-0.3	(-0.4)
Oct	---	---		-0.3	(-0.3)	-0.3	(-0.4)	0.1	(0.1)	-0.4	(-0.5)	-0.6	(-0.8)	-0.3	(-0.3)
Nov	---	---		-0.8	(-1.0)	-0.8	(-1.0)	-0.2	(-0.2)	-0.8	(-1.0)	-0.9	(-1.1)	-0.4	(-0.5)
Dec	---	---		-0.7	(-0.9)	-0.8	(-1.0)	-0.1	(-0.1)	-0.8	(-1.0)	-0.8	(-1.1)	-0.2	(-0.3)
Average	---	---		-0.2	(-0.3)	-0.2	(-0.3)	0.0	(0.0)	-0.3	(-0.4)	-0.4	(-0.6)	-0.2	(-0.2)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-15.8	(-18.5)	-15.8	(-18.6)	-15.9	(-18.6)	-15.7	(-18.5)	-15.9	(-18.6)	-15.8	(-18.5)	-15.8	(-18.5)
Feb	---	-14.3	(-17.2)	-14.4	(-17.3)	-14.4	(-17.3)	-14.3	(-17.2)	-14.4	(-17.3)	-14.4	(-17.3)	-14.3	(-17.3)
Mar	---	-12.8	(-15.7)	-12.8	(-15.7)	-12.8	(-15.7)	-12.8	(-15.7)	-12.8	(-15.7)	-12.8	(-15.7)	-12.8	(-15.7)
Apr	---	-10.2	(-12.9)	-10.2	(-13.0)	-10.2	(-13.0)	-10.2	(-13.0)	-10.2	(-13.0)	-10.2	(-13.0)	-10.2	(-13.0)
May	---	-6.7	(-8.7)	-6.8	(-8.8)	-6.8	(-8.8)	-6.7	(-8.8)	-6.8	(-8.8)	-6.7	(-8.7)	-6.7	(-8.8)
Jun	---	-4.9	(-5.8)	-5.0	(-5.9)	-5.0	(-5.9)	-4.7	(-5.6)	-5.1	(-6.1)	-5.5	(-6.4)	-5.1	(-6.0)
Jul	---	-4.7	(-5.3)	-4.9	(-5.5)	-4.9	(-5.5)	-4.6	(-5.1)	-5.0	(-5.6)	-5.3	(-6.0)	-5.0	(-5.5)
Aug	---	-4.5	(-5.1)	-4.7	(-5.3)	-4.7	(-5.4)	-4.4	(-5.0)	-4.8	(-5.5)	-5.2	(-5.9)	-4.8	(-5.4)
Sep	---	-3.8	(-4.5)	-4.0	(-4.7)	-4.1	(-4.8)	-3.8	(-4.4)	-4.2	(-4.9)	-4.6	(-5.3)	-4.1	(-4.8)
Oct	---	-4.6	(-5.4)	-4.9	(-5.7)	-4.9	(-5.8)	-4.5	(-5.4)	-5.0	(-5.9)	-5.2	(-6.2)	-4.9	(-5.7)
Nov	---	-7.3	(-8.6)	-8.1	(-9.5)	-8.0	(-9.5)	-7.5	(-8.8)	-8.0	(-9.5)	-8.1	(-9.6)	-7.7	(-9.1)
Dec	---	-8.7	(-10.4)	-9.4	(-11.2)	-9.5	(-11.4)	-8.8	(-10.6)	-9.5	(-11.4)	-9.5	(-11.4)	-9.0	(-10.7)
Average	---	-8.2	(-9.8)	-8.4	(-10.0)	-8.4	(-10.1)	-8.2	(-9.7)	-8.5	(-10.1)	-8.6	(-10.3)	-8.4	(-10.0)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 167. Monthly Water Surface Elevation Wet Year (1997) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,185.0	9,177.2	9,176.8	9,177.0	9,177.2	9,177.0	9,177.3	9,177.0
Feb	9,182.9	9,176.6	9,176.4	9,176.6	9,176.7	9,176.6	9,176.8	9,176.5
Mar	9,182.0	9,176.4	9,176.2	9,176.4	9,176.5	9,176.4	9,176.6	9,176.3
Apr	9,182.1	9,175.9	9,175.6	9,175.8	9,176.1	9,175.7	9,176.0	9,175.8
May	9,183.8	9,178.1	9,178.7	9,178.9	9,178.3	9,178.8	9,179.1	9,178.9
Jun	9,195.5	9,192.5	9,193.1	9,193.2	9,192.8	9,193.2	9,193.3	9,193.3
Jul	9,199.8	9,199.9	9,199.9	9,199.9	9,199.9	9,199.9	9,199.9	9,199.9
Aug	9,198.0	9,198.8	9,198.8	9,198.8	9,198.8	9,198.8	9,198.8	9,198.7
Sep	9,196.5	9,196.9	9,197.0	9,196.9	9,196.9	9,196.9	9,197.0	9,196.9
Oct	9,195.9	9,195.7	9,195.7	9,195.7	9,195.7	9,195.7	9,195.7	9,195.7
Nov	9,194.3	9,193.2	9,193.1	9,193.1	9,193.2	9,193.1	9,193.2	9,193.1
Dec	9,192.3	9,190.3	9,190.2	9,190.2	9,190.3	9,190.2	9,190.3	9,190.2
Average	9,190.7	9,187.6	9,187.6	9,187.7	9,187.7	9,187.7	9,187.8	9,187.7
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.4 (-0.5)	-0.2 (-0.3)	0.0 (0.0)	-0.2 (-0.3)	0.1 (0.1)	-0.2 (-0.3)
Feb	---	---	-0.2 (-0.3)	0.0 (0.0)	0.1 (0.1)	0.0 (0.0)	0.2 (0.3)	-0.1 (-0.1)
Mar	---	---	-0.2 (-0.3)	0.0 (0.0)	0.1 (0.1)	0.0 (0.0)	0.2 (0.3)	-0.1 (-0.1)
Apr	---	---	-0.3 (-0.4)	-0.1 (-0.1)	0.1 (0.1)	-0.2 (-0.3)	0.1 (0.1)	-0.1 (-0.1)
May	---	---	0.6 (0.8)	0.8 (1.0)	0.2 (0.3)	0.7 (0.9)	1.0 (1.3)	0.8 (1.0)
Jun	---	---	0.7 (0.8)	0.8 (0.9)	0.4 (0.4)	0.8 (0.9)	0.9 (1.0)	0.9 (1.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.1)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)	0.0 (0.0)
Oct	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Nov	---	---	-0.1 (-0.1)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)
Dec	---	---	-0.1 (-0.1)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)
Average	---	---	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.2 (0.3)	0.1 (0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-7.8 (-9.3)	-8.2 (-9.8)	-8.0 (-9.5)	-7.8 (-9.3)	-8.0 (-9.5)	-7.7 (-9.2)	-8.0 (-9.5)
Feb	---	-6.3 (-7.7)	-6.5 (-7.9)	-6.3 (-7.7)	-6.2 (-7.6)	-6.3 (-7.7)	-6.1 (-7.4)	-6.4 (-7.8)
Mar	---	-5.6 (-6.9)	-5.8 (-7.2)	-5.6 (-6.9)	-5.5 (-6.8)	-5.6 (-6.9)	-5.4 (-6.7)	-5.7 (-7.0)
Apr	---	-6.2 (-7.6)	-6.5 (-8.0)	-6.3 (-7.8)	-6.1 (-7.5)	-6.4 (-7.9)	-6.1 (-7.5)	-6.3 (-7.8)
May	---	-5.7 (-6.9)	-5.1 (-6.2)	-4.9 (-5.9)	-5.5 (-6.6)	-5.0 (-6.0)	-4.7 (-5.7)	-4.9 (-5.9)
Jun	---	-3.1 (-3.3)	-2.4 (-2.5)	-2.3 (-2.4)	-2.7 (-2.9)	-2.3 (-2.4)	-2.2 (-2.3)	-2.2 (-2.3)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	0.8 (0.8)	0.8 (0.8)	0.8 (0.8)	0.8 (0.8)	0.8 (0.8)	0.8 (0.8)	0.7 (0.7)
Sep	---	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)	0.4 (0.4)	0.5 (0.5)	0.4 (0.4)
Oct	---	-0.2 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)	-0.2 (-0.2)
Nov	---	-1.1 (-1.2)	-1.2 (-1.3)	-1.2 (-1.3)	-1.1 (-1.2)	-1.2 (-1.3)	-1.1 (-1.2)	-1.2 (-1.3)
Dec	---	-2.0 (-2.2)	-2.1 (-2.3)	-2.1 (-2.3)	-2.0 (-2.2)	-2.1 (-2.3)	-2.0 (-2.2)	-2.1 (-2.3)
Average	---	-3.1 (-3.4)	-3.1 (-3.4)	-3.0 (-3.3)	-3.0 (-3.3)	-3.0 (-3.3)	-2.9 (-3.2)	-3.0 (-3.3)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 168. Monthly Water Surface Elevation Dry Year (2004) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	9,182.5	9,170.6	9,170.3	9,170.3	9,170.6	9,170.3	9,170.5	9,170.5
Feb	9,181.7	9,169.5	9,169.5	9,169.5	9,169.5	9,169.5	9,169.5	9,169.5
Mar	9,180.4	9,169.4	9,169.4	9,169.4	9,169.4	9,169.4	9,169.4	9,169.4
Apr	9,179.2	9,169.3	9,169.3	9,169.3	9,169.3	9,169.3	9,169.3	9,169.3
May	9,182.5	9,173.8	9,173.7	9,173.7	9,173.8	9,173.7	9,173.9	9,173.8
Jun	9,190.0	9,186.6	9,186.7	9,186.7	9,186.6	9,186.6	9,186.8	9,186.6
Jul	9,191.4	9,188.4	9,188.4	9,188.4	9,188.4	9,188.4	9,188.5	9,188.5
Aug	9,189.6	9,185.5	9,185.5	9,185.5	9,185.5	9,185.5	9,185.6	9,185.6
Sep	9,188.3	9,181.1	9,180.8	9,180.8	9,180.9	9,180.8	9,181.0	9,180.9
Oct	9,187.9	9,175.9	9,175.3	9,175.4	9,175.8	9,175.3	9,175.9	9,175.8
Nov	9,188.2	9,172.5	9,171.8	9,171.8	9,172.3	9,171.8	9,172.4	9,172.3
Dec	9,188.0	9,170.7	9,170.6	9,170.6	9,170.6	9,170.6	9,170.7	9,170.7
Average	9,185.8	9,176.1	9,175.9	9,176.0	9,176.1	9,175.9	9,176.1	9,176.0
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.3 (-0.4)	-0.3 (-0.4)	0.0 (0.0)	-0.3 (-0.4)	-0.2 (-0.3)	-0.2 (-0.3)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	---	-0.1 (-0.1)	-0.1 (-0.1)	0.0 (0.0)	-0.1 (-0.1)	0.0 (0.0)	0.0 (0.0)
Jun	---	---	0.1 (0.1)	0.1 (0.1)	0.0 (0.0)	0.0 (0.0)	0.2 (0.2)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)	0.1 (0.1)
Sep	---	---	-0.3 (-0.4)	-0.3 (-0.4)	-0.2 (-0.2)	-0.3 (-0.4)	-0.1 (-0.1)	-0.2 (-0.2)
Oct	---	---	-0.6 (-0.8)	-0.5 (-0.7)	-0.1 (-0.1)	-0.6 (-0.8)	-0.1 (-0.1)	-0.1 (-0.1)
Nov	---	---	-0.7 (-1.0)	-0.7 (-1.0)	-0.2 (-0.3)	-0.7 (-1.0)	-0.2 (-0.3)	-0.2 (-0.3)
Dec	---	---	-0.1 (-0.1)	-0.1 (-0.1)	-0.1 (-0.1)	-0.1 (-0.1)	0.0 (0.0)	0.0 (0.0)
Average	---	---	-0.2 (-0.2)	-0.2 (-0.2)	0.0 (-0.1)	-0.2 (-0.2)	0.0 (0.0)	0.0 (-0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-11.9 (-14.6)	-12.2 (-15.0)	-12.2 (-15.0)	-11.9 (-14.6)	-12.2 (-15.0)	-12.1 (-14.8)	-12.1 (-14.8)
Feb	---	-12.2 (-15.1)	-12.2 (-15.1)	-12.2 (-15.1)	-12.2 (-15.1)	-12.2 (-15.1)	-12.2 (-15.1)	-12.2 (-15.1)
Mar	---	-11.0 (-13.9)	-11.0 (-13.9)	-11.0 (-13.9)	-11.0 (-13.9)	-11.0 (-13.9)	-11.0 (-13.9)	-11.0 (-13.9)
Apr	---	-9.9 (-12.7)	-9.9 (-12.7)	-9.9 (-12.7)	-9.9 (-12.7)	-9.9 (-12.7)	-9.9 (-12.7)	-9.9 (-12.7)
May	---	-8.7 (-10.7)	-8.8 (-10.8)	-8.8 (-10.8)	-8.7 (-10.7)	-8.8 (-10.8)	-8.7 (-10.7)	-8.7 (-10.7)
Jun	---	-3.4 (-3.8)	-3.3 (-3.7)	-3.3 (-3.7)	-3.4 (-3.8)	-3.4 (-3.8)	-3.2 (-3.6)	-3.4 (-3.8)
Jul	---	-3.0 (-3.3)	-3.0 (-3.3)	-3.0 (-3.3)	-3.0 (-3.3)	-3.0 (-3.3)	-2.9 (-3.2)	-2.9 (-3.2)
Aug	---	-4.0 (-4.5)	-4.0 (-4.5)	-4.0 (-4.5)	-4.0 (-4.5)	-4.0 (-4.5)	-3.9 (-4.4)	-3.9 (-4.4)
Sep	---	-7.2 (-8.2)	-7.5 (-8.6)	-7.5 (-8.6)	-7.4 (-8.5)	-7.5 (-8.6)	-7.3 (-8.4)	-7.4 (-8.5)
Oct	---	-12.0 (-13.8)	-12.6 (-14.5)	-12.5 (-14.4)	-12.1 (-13.9)	-12.6 (-14.5)	-12.1 (-13.9)	-12.1 (-13.9)
Nov	---	-15.7 (-18.0)	-16.4 (-18.8)	-16.4 (-18.8)	-15.9 (-18.2)	-16.4 (-18.8)	-15.9 (-18.2)	-15.9 (-18.2)
Dec	---	-17.3 (-19.9)	-17.4 (-20.0)	-17.4 (-20.0)	-17.4 (-20.0)	-17.4 (-20.0)	-17.3 (-19.9)	-17.3 (-19.9)
Average	---	-9.7 (-11.4)	-9.9 (-11.6)	-9.9 (-11.6)	-9.7 (-11.5)	-9.9 (-11.6)	-9.7 (-11.4)	-9.7 (-11.5)

* Percent changes are calculated using a minimum reservoir water elevation of 9101.0 feet.

Table 169. Monthly Surface Area Overall Average – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,113	2,096	2,099	2,099	2,097	2,099	2,099	2,099
Feb	2,070	2,054	2,057	2,057	2,054	2,058	2,058	2,058
Mar	2,048	2,031	2,035	2,035	2,032	2,035	2,035	2,036
Apr	2,034	2,015	2,021	2,020	2,016	2,021	2,021	2,022
May	2,079	2,058	2,065	2,064	2,058	2,065	2,065	2,067
Jun	2,388	2,373	2,378	2,377	2,372	2,378	2,377	2,381
Jul	2,503	2,493	2,493	2,494	2,490	2,494	2,495	2,498
Aug	2,413	2,401	2,403	2,403	2,402	2,404	2,403	2,404
Sep	2,337	2,321	2,324	2,323	2,322	2,324	2,323	2,324
Oct	2,287	2,268	2,270	2,270	2,269	2,270	2,270	2,271
Nov	2,240	2,222	2,224	2,224	2,223	2,224	2,224	2,225
Dec	2,176	2,159	2,160	2,161	2,160	2,161	2,161	2,162
Average	2,224	2,208	2,211	2,211	2,208	2,211	2,211	2,212
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	3 (0.1)	3 (0.1)	1 (0.0)	3 (0.1)	3 (0.2)	4 (0.2)
Feb	---	---	4 (0.2)	4 (0.2)	1 (0.0)	4 (0.2)	4 (0.2)	4 (0.2)
Mar	---	---	4 (0.2)	4 (0.2)	1 (0.0)	4 (0.2)	4 (0.2)	4 (0.2)
Apr	---	---	6 (0.3)	5 (0.3)	0 (0.0)	6 (0.3)	6 (0.3)	7 (0.3)
May	---	---	7 (0.4)	6 (0.3)	0 (0.0)	8 (0.4)	8 (0.4)	9 (0.4)
Jun	---	---	4 (0.2)	4 (0.2)	-2 (-0.1)	5 (0.2)	4 (0.2)	7 (0.3)
Jul	---	---	0 (0.0)	0 (0.0)	-4 (-0.1)	0 (0.0)	1 (0.0)	4 (0.2)
Aug	---	---	2 (0.1)	2 (0.1)	1 (0.0)	3 (0.1)	2 (0.1)	3 (0.1)
Sep	---	---	3 (0.1)	3 (0.1)	1 (0.0)	3 (0.1)	3 (0.1)	3 (0.1)
Oct	---	---	2 (0.1)	2 (0.1)	1 (0.0)	3 (0.1)	2 (0.1)	3 (0.1)
Nov	---	---	2 (0.1)	2 (0.1)	1 (0.0)	2 (0.1)	2 (0.1)	3 (0.1)
Dec	---	---	2 (0.1)	2 (0.1)	1 (0.1)	2 (0.1)	2 (0.1)	3 (0.1)
Average	---	---	3 (0.1)	3 (0.1)	0 (0.0)	3 (0.2)	3 (0.2)	4 (0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-17 (-0.8)	-14 (-0.7)	-14 (-0.7)	-16 (-0.8)	-14 (-0.7)	-14 (-0.6)	-13 (-0.6)
Feb	---	-17 (-0.8)	-13 (-0.6)	-13 (-0.6)	-16 (-0.8)	-13 (-0.6)	-12 (-0.6)	-12 (-0.6)
Mar	---	-17 (-0.8)	-13 (-0.6)	-13 (-0.6)	-16 (-0.8)	-13 (-0.6)	-13 (-0.6)	-12 (-0.6)
Apr	---	-19 (-0.9)	-13 (-0.6)	-14 (-0.7)	-19 (-0.9)	-13 (-0.6)	-13 (-0.6)	-12 (-0.6)
May	---	-22 (-1.0)	-14 (-0.7)	-15 (-0.7)	-22 (-1.0)	-14 (-0.7)	-14 (-0.7)	-13 (-0.6)
Jun	---	-14 (-0.6)	-10 (-0.4)	-11 (-0.4)	-16 (-0.7)	-10 (-0.4)	-10 (-0.4)	-7 (-0.3)
Jul	---	-10 (-0.4)	-10 (-0.4)	-10 (-0.4)	-14 (-0.5)	-10 (-0.4)	-9 (-0.3)	-6 (-0.2)
Aug	---	-12 (-0.5)	-10 (-0.4)	-11 (-0.4)	-12 (-0.5)	-10 (-0.4)	-10 (-0.4)	-10 (-0.4)
Sep	---	-16 (-0.7)	-14 (-0.6)	-14 (-0.6)	-15 (-0.7)	-13 (-0.6)	-14 (-0.6)	-13 (-0.6)
Oct	---	-19 (-0.8)	-17 (-0.7)	-17 (-0.7)	-18 (-0.8)	-16 (-0.7)	-17 (-0.7)	-16 (-0.7)
Nov	---	-18 (-0.8)	-17 (-0.7)	-16 (-0.7)	-17 (-0.8)	-16 (-0.7)	-16 (-0.7)	-16 (-0.7)
Dec	---	-17 (-0.8)	-15 (-0.7)	-15 (-0.7)	-16 (-0.7)	-15 (-0.7)	-15 (-0.7)	-14 (-0.7)
Average	---	-16 (-0.7)	-13 (-0.6)	-13 (-0.6)	-16 (-0.7)	-13 (-0.6)	-13 (-0.6)	-12 (-0.5)

Table 170. Monthly Surface Area Normal Year (2005) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,182	2,139	2,142	2,142	2,135	2,141	2,141	2,142
Feb	2,110	2,079	2,082	2,082	2,077	2,081	2,082	2,082
Mar	2,070	2,044	2,048	2,048	2,041	2,048	2,048	2,048
Apr	2,003	1,972	1,980	1,980	1,967	1,981	1,981	1,981
May	1,947	1,910	1,923	1,923	1,906	1,924	1,923	1,924
Jun	2,174	2,146	2,154	2,154	2,144	2,154	2,152	2,155
Jul	2,353	2,327	2,337	2,339	2,329	2,338	2,331	2,332
Aug	2,294	2,261	2,277	2,279	2,265	2,278	2,271	2,273
Sep	2,194	2,153	2,175	2,177	2,157	2,176	2,170	2,171
Oct	2,159	2,121	2,139	2,141	2,124	2,140	2,134	2,135
Nov	2,168	2,130	2,147	2,150	2,133	2,148	2,142	2,143
Dec	2,119	2,092	2,104	2,106	2,094	2,105	2,100	2,101
Average	2,148	2,115	2,126	2,127	2,114	2,126	2,123	2,124
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	3 (0.1)	3 (0.1)	-3 (-0.2)	3 (0.1)	3 (0.1)	3 (0.2)
Feb	---	---	2 (0.1)	2 (0.1)	-3 (-0.1)	2 (0.1)	2 (0.1)	3 (0.1)
Mar	---	---	3 (0.2)	3 (0.2)	-3 (-0.2)	3 (0.2)	3 (0.2)	4 (0.2)
Apr	---	---	8 (0.4)	8 (0.4)	-4 (-0.2)	9 (0.5)	9 (0.4)	10 (0.5)
May	---	---	13 (0.7)	13 (0.7)	-5 (-0.2)	14 (0.7)	13 (0.7)	14 (0.7)
Jun	---	---	7 (0.3)	7 (0.3)	-2 (-0.1)	8 (0.4)	5 (0.2)	9 (0.4)
Jul	---	---	10 (0.4)	12 (0.5)	3 (0.1)	11 (0.5)	4 (0.2)	6 (0.3)
Aug	---	---	16 (0.7)	18 (0.8)	4 (0.2)	17 (0.7)	10 (0.4)	12 (0.5)
Sep	---	---	22 (1.0)	24 (1.1)	4 (0.2)	23 (1.1)	16 (0.8)	17 (0.8)
Oct	---	---	18 (0.8)	20 (0.9)	3 (0.1)	19 (0.9)	13 (0.6)	13 (0.6)
Nov	---	---	18 (0.8)	20 (0.9)	4 (0.2)	19 (0.9)	12 (0.6)	13 (0.6)
Dec	---	---	12 (0.6)	14 (0.7)	2 (0.1)	13 (0.6)	8 (0.4)	9 (0.4)
Average	---	---	11 (0.5)	12 (0.6)	0 (0.0)	12 (0.5)	8 (0.4)	9 (0.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-44 (-2.0)	-40 (-1.9)	-40 (-1.8)	-47 (-2.1)	-41 (-1.9)	-41 (-1.9)	-40 (-1.8)
Feb	---	-30 (-1.4)	-28 (-1.3)	-28 (-1.3)	-33 (-1.6)	-28 (-1.3)	-28 (-1.3)	-28 (-1.3)
Mar	---	-26 (-1.3)	-23 (-1.1)	-23 (-1.1)	-29 (-1.4)	-23 (-1.1)	-23 (-1.1)	-22 (-1.1)
Apr	---	-32 (-1.6)	-23 (-1.2)	-23 (-1.2)	-36 (-1.8)	-23 (-1.1)	-23 (-1.1)	-22 (-1.1)
May	---	-37 (-1.9)	-24 (-1.2)	-24 (-1.2)	-41 (-2.1)	-23 (-1.2)	-24 (-1.2)	-22 (-1.2)
Jun	---	-27 (-1.2)	-20 (-0.9)	-20 (-0.9)	-29 (-1.3)	-19 (-0.9)	-22 (-1.0)	-19 (-0.9)
Jul	---	-26 (-1.1)	-16 (-0.7)	-14 (-0.6)	-24 (-1.0)	-15 (-0.6)	-22 (-0.9)	-20 (-0.9)
Aug	---	-33 (-1.4)	-17 (-0.7)	-15 (-0.6)	-29 (-1.3)	-16 (-0.7)	-23 (-1.0)	-21 (-0.9)
Sep	---	-40 (-1.8)	-19 (-0.8)	-16 (-0.7)	-36 (-1.7)	-17 (-0.8)	-24 (-1.1)	-23 (-1.0)
Oct	---	-38 (-1.8)	-20 (-0.9)	-18 (-0.8)	-35 (-1.6)	-19 (-0.9)	-26 (-1.2)	-25 (-1.1)
Nov	---	-38 (-1.8)	-20 (-0.9)	-18 (-0.8)	-35 (-1.6)	-19 (-0.9)	-26 (-1.2)	-25 (-1.2)
Dec	---	-26 (-1.2)	-14 (-0.7)	-13 (-0.6)	-25 (-1.2)	-14 (-0.6)	-18 (-0.9)	-17 (-0.8)
Average	---	-33 (-1.5)	-22 (-1.0)	-21 (-1.0)	-33 (-1.5)	-21 (-1.0)	-25 (-1.2)	-24 (-1.1)

Table 171. Monthly Surface Area Wet Year (1997) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,136	2,122	2,112	2,112	2,119	2,112	2,112	2,115
Feb	2,080	2,068	2,059	2,059	2,066	2,060	2,059	2,061
Mar	2,059	2,046	2,037	2,037	2,045	2,038	2,037	2,040
Apr	2,063	2,047	2,041	2,041	2,045	2,041	2,041	2,043
May	2,105	2,083	2,081	2,081	2,081	2,082	2,081	2,083
Jun	2,570	2,549	2,561	2,559	2,539	2,562	2,561	2,568
Jul	2,758	2,758	2,758	2,758	2,758	2,758	2,758	2,758
Aug	2,681	2,682	2,682	2,682	2,685	2,682	2,682	2,682
Sep	2,614	2,614	2,615	2,614	2,617	2,614	2,615	2,614
Oct	2,586	2,585	2,586	2,585	2,587	2,585	2,586	2,585
Nov	2,516	2,515	2,515	2,514	2,517	2,515	2,515	2,514
Dec	2,428	2,427	2,427	2,427	2,430	2,427	2,427	2,427
Average	2,383	2,375	2,373	2,372	2,374	2,373	2,373	2,374
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-10 (-0.5)	-10 (-0.5)	-3 (-0.1)	-10 (-0.4)	-10 (-0.5)	-7 (-0.3)
Feb	---	---	-9 (-0.4)	-9 (-0.4)	-2 (-0.1)	-9 (-0.4)	-9 (-0.4)	-7 (-0.3)
Mar	---	---	-9 (-0.4)	-9 (-0.5)	-2 (-0.1)	-9 (-0.4)	-9 (-0.4)	-7 (-0.3)
Apr	---	---	-6 (-0.3)	-6 (-0.3)	-2 (-0.1)	-5 (-0.3)	-6 (-0.3)	-4 (-0.2)
May	---	---	-1 (-0.1)	-2 (-0.1)	-1 (-0.1)	-1 (0.0)	-1 (-0.1)	0 (0.0)
Jun	---	---	13 (0.5)	10 (0.4)	-10 (-0.4)	13 (0.5)	13 (0.5)	19 (0.7)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	3 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	1 (0.0)	0 (0.0)	3 (0.1)	0 (0.0)	1 (0.0)	0 (0.0)
Oct	---	---	1 (0.0)	0 (0.0)	3 (0.1)	1 (0.0)	1 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	-1 (0.0)	2 (0.1)	0 (0.0)	0 (0.0)	-1 (0.0)
Dec	---	---	0 (0.0)	-1 (0.0)	2 (0.1)	-1 (0.0)	0 (0.0)	-1 (0.0)
Average	---	---	-2 (-0.1)	-2 (-0.1)	-1 (0.0)	-2 (-0.1)	-2 (-0.1)	-1 (0.0)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	---	-24 (-1.1)	-25 (-1.2)	-17 (-0.8)	-24 (-1.1)	-25 (-1.2)	-22 (-1.0)
Feb	---	---	-21 (-1.0)	-22 (-1.0)	-14 (-0.7)	-21 (-1.0)	-21 (-1.0)	-19 (-0.9)
Mar	---	---	-22 (-1.1)	-22 (-1.1)	-15 (-0.7)	-21 (-1.0)	-22 (-1.1)	-20 (-1.0)
Apr	---	---	-22 (-1.1)	-22 (-1.1)	-18 (-0.9)	-22 (-1.0)	-22 (-1.1)	-20 (-1.0)
May	---	---	-24 (-1.1)	-24 (-1.1)	-24 (-1.1)	-24 (-1.1)	-24 (-1.1)	-23 (-1.1)
Jun	---	---	-9 (-0.3)	-11 (-0.4)	-31 (-1.2)	-8 (-0.3)	-8 (-0.3)	-2 (-0.1)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	1 (0.0)	1 (0.0)	4 (0.2)	1 (0.0)	1 (0.0)	1 (0.0)
Sep	---	---	1 (0.0)	0 (0.0)	3 (0.1)	1 (0.0)	1 (0.0)	0 (0.0)
Oct	---	---	-1 (0.0)	-1 (0.0)	1 (0.1)	-1 (0.0)	-1 (0.0)	-1 (0.0)
Nov	---	---	-1 (0.0)	-1 (-0.1)	2 (0.1)	-1 (0.0)	-1 (0.0)	-1 (-0.1)
Dec	---	---	-1 (-0.1)	-2 (-0.1)	2 (0.1)	-1 (-0.1)	-1 (0.0)	-2 (-0.1)
Average	---	---	-10 (-0.4)	-11 (-0.4)	-9 (-0.4)	-10 (-0.4)	-10 (-0.4)	-9 (-0.4)

Table 172. Monthly Surface Area Dry Year (2004) – Twin Lakes Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	2,072	2,050		2,050		2,051		2,046		2,051		2,051		2,051	
Feb	2,054	2,031		2,031		2,031		2,026		2,031		2,031		2,032	
Mar	2,022	1,994		1,996		1,997		1,989		1,997		1,996		1,998	
Apr	1,989	1,956		1,961		1,962		1,950		1,962		1,962		1,963	
May	2,076	2,048		2,055		2,055		2,043		2,056		2,056		2,057	
Jun	2,330	2,309		2,316		2,316		2,304		2,316		2,316		2,317	
Jul	2,388	2,367		2,373		2,373		2,362		2,373		2,373		2,373	
Aug	2,311	2,279		2,284		2,284		2,274		2,283		2,284		2,284	
Sep	2,262	2,216		2,222		2,222		2,212		2,220		2,221		2,222	
Oct	2,247	2,198		2,203		2,203		2,194		2,202		2,203		2,203	
Nov	2,257	2,210		2,214		2,214		2,206		2,213		2,213		2,214	
Dec	2,250	2,203		2,207		2,207		2,199		2,206		2,206		2,207	
Average	2,188	2,155		2,159		2,160		2,151		2,159		2,159		2,160	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	-4	(-0.2)	1	(0.0)	0	(0.0)	1	(0.0)
Feb	---	---		0	(0.0)	0	(0.0)	-4	(-0.2)	1	(0.0)	0	(0.0)	1	(0.0)
Mar	---	---		2	(0.1)	2	(0.1)	-5	(-0.3)	3	(0.1)	2	(0.1)	3	(0.2)
Apr	---	---		5	(0.3)	5	(0.3)	-6	(-0.3)	6	(0.3)	5	(0.3)	6	(0.3)
May	---	---		7	(0.4)	7	(0.4)	-5	(-0.2)	8	(0.4)	8	(0.4)	9	(0.4)
Jun	---	---		7	(0.3)	7	(0.3)	-5	(-0.2)	7	(0.3)	8	(0.3)	8	(0.4)
Jul	---	---		6	(0.2)	6	(0.3)	-5	(-0.2)	5	(0.2)	6	(0.2)	6	(0.3)
Aug	---	---		6	(0.2)	6	(0.3)	-4	(-0.2)	5	(0.2)	6	(0.2)	6	(0.3)
Sep	---	---		5	(0.2)	5	(0.2)	-4	(-0.2)	4	(0.2)	5	(0.2)	6	(0.2)
Oct	---	---		5	(0.2)	5	(0.2)	-4	(-0.2)	4	(0.2)	5	(0.2)	5	(0.2)
Nov	---	---		4	(0.2)	4	(0.2)	-4	(-0.2)	3	(0.1)	4	(0.2)	4	(0.2)
Dec	---	---		4	(0.2)	4	(0.2)	-4	(-0.2)	3	(0.1)	3	(0.1)	4	(0.2)
Average	---	---		4	(0.2)	4	(0.2)	-5	(-0.2)	4	(0.2)	4	(0.2)	5	(0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-22	(-1.1)	-22	(-1.1)	-22	(-1.0)	-26	(-1.2)	-21	(-1.0)	-22	(-1.0)	-21	(-1.0)
Feb	---	-23	(-1.1)	-23	(-1.1)	-22	(-1.1)	-27	(-1.3)	-22	(-1.1)	-23	(-1.1)	-22	(-1.1)
Mar	---	-28	(-1.4)	-26	(-1.3)	-25	(-1.3)	-33	(-1.6)	-25	(-1.2)	-26	(-1.3)	-25	(-1.2)
Apr	---	-32	(-1.6)	-27	(-1.4)	-27	(-1.4)	-38	(-1.9)	-27	(-1.3)	-27	(-1.4)	-26	(-1.3)
May	---	-28	(-1.4)	-21	(-1.0)	-21	(-1.0)	-33	(-1.6)	-21	(-1.0)	-21	(-1.0)	-19	(-0.9)
Jun	---	-21	(-0.9)	-14	(-0.6)	-14	(-0.6)	-26	(-1.1)	-14	(-0.6)	-14	(-0.6)	-13	(-0.6)
Jul	---	-21	(-0.9)	-15	(-0.6)	-15	(-0.6)	-26	(-1.1)	-16	(-0.7)	-15	(-0.6)	-15	(-0.6)
Aug	---	-33	(-1.4)	-27	(-1.2)	-27	(-1.2)	-37	(-1.6)	-28	(-1.2)	-27	(-1.2)	-27	(-1.2)
Sep	---	-45	(-2.0)	-40	(-1.8)	-40	(-1.8)	-50	(-2.2)	-41	(-1.8)	-40	(-1.8)	-40	(-1.8)
Oct	---	-49	(-2.2)	-44	(-2.0)	-44	(-2.0)	-53	(-2.4)	-45	(-2.0)	-45	(-2.0)	-44	(-2.0)
Nov	---	-47	(-2.1)	-43	(-1.9)	-43	(-1.9)	-52	(-2.3)	-44	(-2.0)	-44	(-1.9)	-43	(-1.9)
Dec	---	-47	(-2.1)	-43	(-1.9)	-43	(-1.9)	-51	(-2.3)	-44	(-2.0)	-44	(-2.0)	-43	(-1.9)
Average	---	-33	(-1.5)	-29	(-1.3)	-29	(-1.3)	-38	(-1.7)	-29	(-1.3)	-29	(-1.3)	-28	(-1.3)

Table 173. Monthly Surface Area Overall Average – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,113	1,949	1,942	1,945	1,942	1,942	1,951	1,949
Feb	2,070	1,896	1,890	1,893	1,893	1,891	1,895	1,894
Mar	2,048	1,867	1,860	1,862	1,863	1,861	1,866	1,862
Apr	2,034	1,850	1,844	1,845	1,846	1,844	1,847	1,844
May	2,079	1,915	1,911	1,913	1,911	1,912	1,913	1,910
Jun	2,388	2,266	2,267	2,267	2,267	2,267	2,265	2,267
Jul	2,503	2,426	2,431	2,430	2,421	2,432	2,426	2,429
Aug	2,413	2,356	2,360	2,361	2,353	2,360	2,358	2,358
Sep	2,337	2,264	2,267	2,270	2,263	2,267	2,266	2,263
Oct	2,287	2,170	2,168	2,171	2,166	2,167	2,172	2,168
Nov	2,240	2,089	2,082	2,086	2,083	2,082	2,089	2,087
Dec	2,176	2,010	2,004	2,007	2,003	2,003	2,012	2,010
Average	2,224	2,088	2,086	2,088	2,084	2,086	2,088	2,087
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-7 (-0.3)	-4 (-0.2)	-7 (-0.4)	-8 (-0.4)	2 (0.1)	0 (0.0)
Feb	---	---	-5 (-0.3)	-3 (-0.1)	-3 (-0.1)	-5 (-0.3)	-1 (0.0)	-2 (-0.1)
Mar	---	---	-6 (-0.3)	-5 (-0.3)	-4 (-0.2)	-6 (-0.3)	-1 (-0.1)	-5 (-0.3)
Apr	---	---	-6 (-0.3)	-5 (-0.2)	-4 (-0.2)	-6 (-0.3)	-2 (-0.1)	-5 (-0.3)
May	---	---	-4 (-0.2)	-3 (-0.1)	-4 (-0.2)	-4 (-0.2)	-2 (-0.1)	-5 (-0.3)
Jun	---	---	1 (0.0)	1 (0.1)	2 (0.1)	1 (0.0)	-1 (0.0)	1 (0.0)
Jul	---	---	5 (0.2)	4 (0.2)	-5 (-0.2)	5 (0.2)	0 (0.0)	3 (0.1)
Aug	---	---	5 (0.2)	6 (0.2)	-3 (-0.1)	5 (0.2)	2 (0.1)	3 (0.1)
Sep	---	---	3 (0.2)	6 (0.3)	-1 (0.0)	4 (0.2)	2 (0.1)	-1 (0.0)
Oct	---	---	-2 (-0.1)	1 (0.0)	-4 (-0.2)	-3 (-0.1)	2 (0.1)	-2 (-0.1)
Nov	---	---	-6 (-0.3)	-3 (-0.1)	-6 (-0.3)	-6 (-0.3)	1 (0.0)	-2 (-0.1)
Dec	---	---	-6 (-0.3)	-3 (-0.1)	-6 (-0.3)	-6 (-0.3)	2 (0.1)	0 (0.0)
Average	---	---	-2 (-0.1)	-1 (0.0)	-4 (-0.2)	-2 (-0.1)	0 (0.0)	-1 (-0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-164 (-7.7)	-170 (-8.1)	-168 (-7.9)	-171 (-8.1)	-171 (-8.1)	-162 (-7.7)	-164 (-7.8)
Feb	---	-174 (-8.4)	-180 (-8.7)	-177 (-8.5)	-177 (-8.5)	-180 (-8.7)	-175 (-8.4)	-177 (-8.5)
Mar	---	-181 (-8.8)	-187 (-9.1)	-186 (-9.1)	-185 (-9.0)	-187 (-9.1)	-182 (-8.9)	-186 (-9.1)
Apr	---	-184 (-9.1)	-190 (-9.4)	-189 (-9.3)	-188 (-9.3)	-190 (-9.3)	-187 (-9.2)	-190 (-9.3)
May	---	-164 (-7.9)	-168 (-8.1)	-167 (-8.0)	-168 (-8.1)	-168 (-8.1)	-166 (-8.0)	-169 (-8.1)
Jun	---	-122 (-5.1)	-121 (-5.1)	-120 (-5.0)	-120 (-5.0)	-121 (-5.0)	-122 (-5.1)	-120 (-5.0)
Jul	---	-77 (-3.1)	-73 (-2.9)	-74 (-2.9)	-82 (-3.3)	-72 (-2.9)	-77 (-3.1)	-74 (-3.0)
Aug	---	-58 (-2.4)	-53 (-2.2)	-52 (-2.2)	-60 (-2.5)	-53 (-2.2)	-56 (-2.3)	-55 (-2.3)
Sep	---	-73 (-3.1)	-70 (-3.0)	-67 (-2.9)	-74 (-3.2)	-70 (-3.0)	-72 (-3.1)	-74 (-3.2)
Oct	---	-117 (-5.1)	-119 (-5.2)	-116 (-5.1)	-121 (-5.3)	-119 (-5.2)	-114 (-5.0)	-119 (-5.2)
Nov	---	-151 (-6.8)	-158 (-7.0)	-154 (-6.9)	-157 (-7.0)	-158 (-7.0)	-151 (-6.7)	-153 (-6.8)
Dec	---	-166 (-7.6)	-172 (-7.9)	-169 (-7.8)	-173 (-7.9)	-173 (-7.9)	-164 (-7.5)	-166 (-7.6)
Average	---	-136 (-6.1)	-138 (-6.2)	-136 (-6.1)	-140 (-6.3)	-138 (-6.2)	-136 (-6.1)	-137 (-6.2)

Table 174. Monthly Surface Area Normal Year (2005) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	2,182	1,742		1,740		1,739		1,743		1,739		1,741		1,742	
Feb	2,110	1,722		1,721		1,721		1,723		1,721		1,722		1,722	
Mar	2,070	1,720		1,719		1,719		1,720		1,719		1,720		1,720	
Apr	2,003	1,718		1,718		1,718		1,718		1,718		1,718		1,718	
May	1,947	1,758		1,757		1,757		1,758		1,757		1,759		1,758	
Jun	2,174	2,033		2,029		2,029		2,037		2,026		2,018		2,028	
Jul	2,353	2,165		2,159		2,158		2,170		2,154		2,141		2,155	
Aug	2,294	2,124		2,118		2,118		2,126		2,115		2,106		2,116	
Sep	2,194	2,078		2,073		2,072		2,080		2,069		2,060		2,071	
Oct	2,159	2,038		2,032		2,031		2,040		2,029		2,023		2,032	
Nov	2,168	1,973		1,951		1,952		1,969		1,952		1,949		1,961	
Dec	2,119	1,891		1,872		1,869		1,888		1,869		1,868		1,884	
Average	2,148	1,914		1,908		1,907		1,914		1,906		1,902		1,909	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		-2	(-0.1)	-3	(-0.2)	0	(0.0)	-3	(-0.2)	-1	(-0.1)	-1	(-0.1)
Feb	---	---		-1	(-0.1)	-1	(-0.1)	0	(0.0)	-1	(-0.1)	-1	(-0.1)	-1	(0.0)
Mar	---	---		-1	(0.0)	-1	(0.0)	0	(0.0)	-1	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		-1	(0.0)	-1	(0.0)	0	(0.0)	-1	(0.0)	0	(0.0)	0	(0.0)
May	---	---		-1	(-0.1)	-1	(-0.1)	0	(0.0)	-1	(-0.1)	1	(0.1)	0	(0.0)
Jun	---	---		-4	(-0.2)	-4	(-0.2)	4	(0.2)	-7	(-0.3)	-15	(-0.7)	-5	(-0.3)
Jul	---	---		-6	(-0.3)	-7	(-0.3)	6	(0.3)	-10	(-0.5)	-23	(-1.1)	-9	(-0.4)
Aug	---	---		-5	(-0.2)	-6	(-0.3)	2	(0.1)	-9	(-0.4)	-18	(-0.9)	-8	(-0.4)
Sep	---	---		-5	(-0.3)	-7	(-0.3)	1	(0.1)	-9	(-0.4)	-18	(-0.9)	-8	(-0.4)
Oct	---	---		-6	(-0.3)	-7	(-0.3)	1	(0.1)	-9	(-0.5)	-15	(-0.8)	-6	(-0.3)
Nov	---	---		-22	(-1.1)	-21	(-1.1)	-4	(-0.2)	-21	(-1.1)	-24	(-1.2)	-12	(-0.6)
Dec	---	---		-19	(-1.0)	-22	(-1.1)	-2	(-0.1)	-22	(-1.2)	-22	(-1.2)	-7	(-0.4)
Average	---	---		-6	(-0.3)	-7	(-0.3)	1	(0.0)	-8	(-0.4)	-11	(-0.6)	-5	(-0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-440	(-20.2)	-442	(-20.3)	-443	(-20.3)	-440	(-20.1)	-443	(-20.3)	-441	(-20.2)	-441	(-20.2)
Feb	---	-387	(-18.4)	-389	(-18.4)	-389	(-18.4)	-387	(-18.3)	-389	(-18.4)	-388	(-18.4)	-388	(-18.4)
Mar	---	-351	(-16.9)	-351	(-17.0)	-351	(-17.0)	-351	(-16.9)	-351	(-17.0)	-351	(-16.9)	-351	(-16.9)
Apr	---	-285	(-14.2)	-286	(-14.3)	-286	(-14.3)	-285	(-14.2)	-286	(-14.3)	-285	(-14.2)	-285	(-14.2)
May	---	-189	(-9.7)	-190	(-9.7)	-190	(-9.7)	-189	(-9.7)	-190	(-9.7)	-188	(-9.6)	-189	(-9.7)
Jun	---	-140	(-6.5)	-144	(-6.6)	-144	(-6.6)	-136	(-6.3)	-147	(-6.8)	-155	(-7.1)	-146	(-6.7)
Jul	---	-188	(-8.0)	-194	(-8.2)	-195	(-8.3)	-183	(-7.8)	-199	(-8.4)	-212	(-9.0)	-198	(-8.4)
Aug	---	-170	(-7.4)	-176	(-7.7)	-177	(-7.7)	-168	(-7.3)	-179	(-7.8)	-189	(-8.2)	-178	(-7.8)
Sep	---	-116	(-5.3)	-121	(-5.5)	-122	(-5.6)	-114	(-5.2)	-124	(-5.7)	-133	(-6.1)	-123	(-5.6)
Oct	---	-121	(-5.6)	-127	(-5.9)	-128	(-5.9)	-120	(-5.5)	-130	(-6.0)	-136	(-6.3)	-127	(-5.9)
Nov	---	-195	(-9.0)	-217	(-10.0)	-216	(-10.0)	-199	(-9.2)	-216	(-10.0)	-219	(-10.1)	-206	(-9.5)
Dec	---	-228	(-10.8)	-246	(-11.6)	-249	(-11.8)	-230	(-10.9)	-250	(-11.8)	-250	(-11.8)	-235	(-11.1)
Average	---	-234	(-10.9)	-240	(-11.2)	-241	(-11.2)	-233	(-10.9)	-242	(-11.3)	-246	(-11.4)	-239	(-11.1)

Table 175. Monthly Surface Area Wet Year (1997) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,136	1,932	1,922	1,927	1,934	1,927	1,936	1,928
Feb	2,080	1,915	1,910	1,916	1,919	1,917	1,921	1,914
Mar	2,059	1,910	1,904	1,911	1,913	1,911	1,915	1,909
Apr	2,063	1,896	1,887	1,893	1,901	1,892	1,898	1,892
May	2,105	1,959	1,973	1,978	1,963	1,977	1,983	1,979
Jun	2,570	2,451	2,476	2,479	2,463	2,481	2,482	2,485
Jul	2,758	2,760	2,760	2,760	2,760	2,760	2,760	2,760
Aug	2,681	2,714	2,714	2,714	2,713	2,714	2,714	2,712
Sep	2,614	2,633	2,633	2,633	2,632	2,633	2,633	2,630
Oct	2,586	2,579	2,579	2,579	2,579	2,579	2,580	2,576
Nov	2,516	2,467	2,463	2,464	2,466	2,464	2,467	2,464
Dec	2,428	2,342	2,338	2,339	2,341	2,339	2,342	2,339
Average	2,383	2,296	2,297	2,300	2,299	2,299	2,303	2,299
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-10 (-0.5)	-5 (-0.2)	2 (0.1)	-5 (-0.2)	4 (0.2)	-3 (-0.2)
Feb	---	---	-5 (-0.3)	1 (0.1)	3 (0.2)	2 (0.1)	6 (0.3)	-1 (-0.1)
Mar	---	---	-5 (-0.3)	1 (0.1)	3 (0.2)	2 (0.1)	6 (0.3)	-1 (0.0)
Apr	---	---	-9 (-0.5)	-3 (-0.2)	4 (0.2)	-5 (-0.2)	2 (0.1)	-4 (-0.2)
May	---	---	15 (0.8)	20 (1.0)	4 (0.2)	18 (0.9)	25 (1.3)	20 (1.0)
Jun	---	---	26 (1.0)	29 (1.2)	13 (0.5)	30 (1.2)	32 (1.3)	34 (1.4)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	1 (0.0)	0 (0.0)	-1 (0.0)	0 (0.0)	1 (0.0)	-2 (-0.1)
Sep	---	---	1 (0.0)	0 (0.0)	-1 (0.0)	0 (0.0)	1 (0.0)	-3 (-0.1)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	-3 (-0.1)
Nov	---	---	-3 (-0.1)	-2 (-0.1)	0 (0.0)	-2 (-0.1)	1 (0.0)	-2 (-0.1)
Dec	---	---	-4 (-0.2)	-3 (-0.1)	-1 (0.0)	-3 (-0.1)	1 (0.0)	-2 (-0.1)
Average	---	---	0 (0.0)	3 (0.1)	2 (0.1)	3 (0.1)	6 (0.3)	3 (0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-205 (-9.6)	-215 (-10.1)	-209 (-9.8)	-202 (-9.5)	-209 (-9.8)	-200 (-9.4)	-208 (-9.7)
Feb	---	-165 (-7.9)	-170 (-8.2)	-164 (-7.9)	-162 (-7.8)	-164 (-7.9)	-160 (-7.7)	-166 (-8.0)
Mar	---	-150 (-7.3)	-155 (-7.5)	-148 (-7.2)	-146 (-7.1)	-148 (-7.2)	-144 (-7.0)	-150 (-7.3)
Apr	---	-167 (-8.1)	-176 (-8.5)	-170 (-8.2)	-162 (-7.9)	-171 (-8.3)	-165 (-8.0)	-171 (-8.3)
May	---	-147 (-7.0)	-132 (-6.3)	-127 (-6.0)	-142 (-6.8)	-129 (-6.1)	-122 (-5.8)	-126 (-6.0)
Jun	---	-119 (-4.6)	-94 (-3.6)	-90 (-3.5)	-106 (-4.1)	-89 (-3.5)	-87 (-3.4)	-85 (-3.3)
Jul	---	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)	2 (0.1)
Aug	---	33 (1.2)	33 (1.2)	33 (1.2)	32 (1.2)	33 (1.2)	34 (1.2)	31 (1.2)
Sep	---	19 (0.7)	19 (0.7)	19 (0.7)	18 (0.7)	19 (0.7)	19 (0.7)	16 (0.6)
Oct	---	-7 (-0.3)	-8 (-0.3)	-7 (-0.3)	-8 (-0.3)	-8 (-0.3)	-6 (-0.2)	-10 (-0.4)
Nov	---	-49 (-2.0)	-53 (-2.1)	-52 (-2.1)	-49 (-2.0)	-52 (-2.1)	-48 (-1.9)	-52 (-2.1)
Dec	---	-87 (-3.6)	-91 (-3.7)	-89 (-3.7)	-87 (-3.6)	-89 (-3.7)	-86 (-3.5)	-89 (-3.7)
Average	---	-87 (-3.6)	-86 (-3.6)	-84 (-3.5)	-84 (-3.5)	-84 (-3.5)	-80 (-3.4)	-84 (-3.5)

Table 176. Monthly Surface Area Dry Year (2004) – Twin Lakes Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	2,072	1,744	1,737	1,737	1,744	1,737	1,741	1,741
Feb	2,054	1,717	1,717	1,717	1,717	1,717	1,717	1,717
Mar	2,022	1,715	1,714	1,714	1,715	1,714	1,714	1,714
Apr	1,989	1,713	1,713	1,713	1,713	1,713	1,713	1,713
May	2,076	1,836	1,835	1,835	1,837	1,834	1,839	1,836
Jun	2,330	2,208	2,210	2,210	2,209	2,208	2,213	2,208
Jul	2,388	2,265	2,266	2,266	2,265	2,265	2,269	2,268
Aug	2,311	2,155	2,156	2,156	2,154	2,155	2,157	2,157
Sep	2,262	2,036	2,028	2,030	2,032	2,028	2,034	2,032
Oct	2,247	1,897	1,880	1,881	1,892	1,878	1,895	1,892
Nov	2,257	1,799	1,780	1,780	1,793	1,779	1,795	1,793
Dec	2,250	1,747	1,745	1,745	1,746	1,745	1,746	1,746
Average	2,188	1,903	1,898	1,899	1,901	1,898	1,903	1,901
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-7 (-0.4)	-7 (-0.4)	0 (0.0)	-7 (-0.4)	-4 (-0.2)	-3 (-0.2)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	-1 (0.0)	-1 (0.0)	1 (0.0)	-2 (-0.1)	2 (0.1)	0 (0.0)
Jun	---	---	2 (0.1)	3 (0.1)	1 (0.0)	0 (0.0)	5 (0.2)	1 (0.0)
Jul	---	---	1 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)	4 (0.2)	2 (0.1)
Aug	---	---	0 (0.0)	0 (0.0)	-1 (-0.1)	-1 (0.0)	1 (0.1)	1 (0.1)
Sep	---	---	-8 (-0.4)	-6 (-0.3)	-4 (-0.2)	-9 (-0.4)	-3 (-0.1)	-4 (-0.2)
Oct	---	---	-18 (-0.9)	-17 (-0.9)	-5 (-0.3)	-19 (-1.0)	-3 (-0.1)	-6 (-0.3)
Nov	---	---	-19 (-1.0)	-19 (-1.1)	-6 (-0.3)	-20 (-1.1)	-4 (-0.2)	-6 (-0.3)
Dec	---	---	-2 (-0.1)	-2 (-0.1)	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)
Average	---	---	-4 (-0.2)	-4 (-0.2)	-1 (-0.1)	-5 (-0.3)	0 (0.0)	-1 (-0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-328 (-15.8)	-335 (-16.2)	-335 (-16.2)	-329 (-15.9)	-336 (-16.2)	-332 (-16.0)	-332 (-16.0)
Feb	---	-337 (-16.4)	-337 (-16.4)	-337 (-16.4)	-337 (-16.4)	-337 (-16.4)	-337 (-16.4)	-337 (-16.4)
Mar	---	-308 (-15.2)	-308 (-15.2)	-308 (-15.2)	-308 (-15.2)	-308 (-15.2)	-308 (-15.2)	-308 (-15.2)
Apr	---	-275 (-13.8)	-275 (-13.8)	-275 (-13.8)	-275 (-13.8)	-275 (-13.8)	-275 (-13.8)	-275 (-13.8)
May	---	-240 (-11.6)	-241 (-11.6)	-241 (-11.6)	-240 (-11.5)	-242 (-11.7)	-238 (-11.4)	-240 (-11.6)
Jun	---	-123 (-5.3)	-121 (-5.2)	-120 (-5.1)	-122 (-5.2)	-122 (-5.2)	-117 (-5.0)	-122 (-5.2)
Jul	---	-123 (-5.2)	-123 (-5.1)	-122 (-5.1)	-124 (-5.2)	-123 (-5.2)	-119 (-5.0)	-121 (-5.1)
Aug	---	-156 (-6.7)	-156 (-6.7)	-155 (-6.7)	-157 (-6.8)	-156 (-6.8)	-154 (-6.7)	-154 (-6.7)
Sep	---	-225 (-10.0)	-233 (-10.3)	-232 (-10.2)	-230 (-10.1)	-234 (-10.3)	-228 (-10.1)	-230 (-10.2)
Oct	---	-350 (-15.6)	-368 (-16.4)	-367 (-16.3)	-355 (-15.8)	-369 (-16.4)	-353 (-15.7)	-356 (-15.8)
Nov	---	-458 (-20.3)	-477 (-21.1)	-477 (-21.1)	-464 (-20.6)	-478 (-21.2)	-462 (-20.5)	-464 (-20.6)
Dec	---	-504 (-22.4)	-505 (-22.4)	-505 (-22.4)	-505 (-22.4)	-505 (-22.4)	-504 (-22.4)	-505 (-22.4)
Average	---	-286 (-13.0)	-290 (-13.2)	-289 (-13.2)	-287 (-13.1)	-290 (-13.3)	-286 (-13.0)	-287 (-13.1)

Pueblo Reservoir

Pueblo Reservoir is located on the mainstem of the Arkansas River, and is the largest reservoir in the Fry-Ark Project. Pueblo Reservoir is the terminal storage for the Fry-Ark Project, and provides storage space for the WWSP and numerous municipalities through short term and long term excess capacity contracts and the proposed Master Contract being evaluated in this EIS. Changes in operations of the Arkansas River are reflected in differences in Pueblo Reservoir storage contents. This is because changes in operations within the basin affect the demand for stored water in the reservoir. Increased demands by senior water rights will require increased deliveries from storage for junior water rights. Conversely, increased water supply availability for junior water rights will decrease the amount of stored water needed to meet its demands. Mean monthly direct effects analysis storage contents for Pueblo Reservoir are presented in Table 177 through Table 180.

- In the No Action Alternative, most of the AVC participant demand is met by alluvial pumping. The AVC participants are able to use a large portion of their non-project supplies, which are located downstream from Pueblo Reservoir, for augmentation purposes. Thus, a larger proportion of Fry-Ark water remains in Pueblo Reservoir under the No Action Alternative than in the other alternatives. Any remaining augmentation demand is met with Fry-Ark water. No Action Alternative storage contents would be lower than contents because of higher municipal demand.

- In the Comanche-South Alternative Pueblo Reservoir storage is more, on average, than the No Action Alternative. This is because there is more excess storage of Master Contract supplies than there is use of Fry-Ark water in the AVC. The overall effect is negligible. Effects during the typical normal year of 2005 and the typical dry year of 2004 show minor decreases in storage. These years follow a string of dry and normal years that reduced the Fry-Ark storage account and the Master Contract accounts, requiring more use of Fry-Ark water in AVC.

- The Pueblo Dam-South Alternative is similar to the Comanche-South Alternative except that Fry-Ark carryover storage is restricted to a two-year supply, which is approximately 10,000 acre-feet less carryover storage capacity than other alternatives. Thus, there are fewer Fry-Ark return flows to be exchanged back into Pueblo under this alternative. This results in slightly less storage than the No-Action, although all effects are negligible. There are minor decreases in storage during the normal year of 2005 and the typical dry year of 2004. These years follow a string of dry and normal years that decreased the Fry-Ark storage account. There are even fewer Fry-Ark return flows to be exchanged back into Pueblo during these years.

- The Joint Use Pipeline North Alternative consistently has lower Pueblo Reservoir storage as there is no Master Contract storage, and the AVC participants must use more Fry-Ark supplies to meet demand through the AVC. Overall average effects are minor. Effects during the typical normal year of 2005 and the dry year of 2004 are more pronounced than the overall average. These years follow a string of dry and normal years that reduced the Fry-Ark storage account, which is heavily used in the Joint Use Pipeline North Alternative.

- The Pueblo Dam-North Alternative is similar to the Comanche-South Alternative. All overall effects are negligible, for the same reasons.

- The River South Alternative has slightly higher storage because the AVC river intake enables more exchanges into Pueblo Reservoir. Overall average effects are negligible to minor. There are minor decreases in storage during the normal year of 2005 and the typical dry year of 2004. These years follow a string of dry and normal years that decreased the Fry-Ark storage account. Because of this, there are fewer Fry-Ark return flows to be exchanged back into Pueblo during these years

- The Master Contract Alternative has more storage than the No Action Alternative due to the Master Contract accounts. It has more storage than the other alternatives with a Master Contract because without the AVC, Fry-Ark water is not utilized to meet AVC demand, leading to more carryover storage in Fry-Ark space. All effects are minor.

Table 177. Monthly Storage Contents Overall Average – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	212,400	207,200	209,400	205,600	189,900	209,800	211,400	217,900
Feb	224,700	218,800	220,700	216,900	201,300	221,100	222,800	229,500
Mar	232,800	226,900	228,500	224,900	209,800	228,900	230,500	237,200
Apr	223,100	218,200	219,900	216,400	201,900	220,300	221,700	228,300
May	210,800	207,100	208,400	205,100	190,500	208,800	210,200	216,800
Jun	207,900	204,300	205,600	202,300	187,300	206,000	207,300	214,000
Jul	201,300	197,500	198,900	196,000	182,000	199,200	200,400	206,900
Aug	188,700	185,500	187,200	183,800	169,100	187,500	188,700	195,200
Sep	181,300	177,600	179,400	175,600	160,300	179,800	181,000	187,700
Oct	178,400	173,700	176,200	172,400	156,700	176,600	178,000	184,200
Nov	182,200	178,200	181,100	177,300	160,900	181,500	182,900	189,300
Dec	197,100	192,600	195,000	191,300	175,300	195,400	196,900	203,300
Average	203,300	198,800	200,700	197,200	182,000	201,100	202,500	209,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	2,200 (1.1)	-1,600 (-0.8)	-17,300 (-8.3)	2,600 (1.3)	4,200 (2.0)	10,700 (5.2)
Feb	---	---	1,900 (0.9)	-1,900 (-0.9)	-17,500 (-8.0)	2,300 (1.1)	4,000 (1.8)	10,700 (4.9)
Mar	---	---	1,600 (0.7)	-2,000 (-0.9)	-17,100 (-7.5)	2,000 (0.9)	3,600 (1.6)	10,300 (4.5)
Apr	---	---	1,700 (0.8)	-1,800 (-0.8)	-16,300 (-7.5)	2,100 (1.0)	3,500 (1.6)	10,100 (4.6)
May	---	---	1,300 (0.6)	-2,000 (-1.0)	-16,600 (-8.0)	1,700 (0.8)	3,100 (1.5)	9,700 (4.7)
Jun	---	---	1,300 (0.6)	-2,000 (-1.0)	-17,000 (-8.3)	1,700 (0.8)	3,000 (1.5)	9,700 (4.7)
Jul	---	---	1,400 (0.7)	-1,500 (-0.8)	-15,500 (-7.8)	1,700 (0.9)	2,900 (1.5)	9,400 (4.8)
Aug	---	---	1,700 (0.9)	-1,700 (-0.9)	-16,400 (-8.8)	2,000 (1.1)	3,200 (1.7)	9,700 (5.2)
Sep	---	---	1,800 (1.0)	-2,000 (-1.1)	-17,300 (-9.7)	2,200 (1.2)	3,400 (1.9)	10,100 (5.7)
Oct	---	---	2,500 (1.4)	-1,300 (-0.7)	-17,000 (-9.8)	2,900 (1.7)	4,300 (2.5)	10,500 (6.0)
Nov	---	---	2,900 (1.6)	-900 (-0.5)	-17,300 (-9.7)	3,300 (1.9)	4,700 (2.6)	11,100 (6.2)
Dec	---	---	2,400 (1.2)	-1,300 (-0.7)	-17,300 (-9.0)	2,800 (1.5)	4,300 (2.2)	10,700 (5.6)
Average	---	---	1,900 (1.0)	-1,600 (-0.8)	-16,800 (-8.5)	2,300 (1.2)	3,700 (1.9)	10,300 (5.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-5,200 (-2.4)	-3,000 (-1.4)	-6,800 (-3.2)	-22,500 (-10.6)	-2,600 (-1.2)	-1,000 (-0.5)	5,500 (2.6)
Feb	---	-5,900 (-2.6)	-4,000 (-1.8)	-7,800 (-3.5)	-23,400 (-10.4)	-3,600 (-1.6)	-1,900 (-0.8)	4,800 (2.1)
Mar	---	-5,900 (-2.5)	-4,300 (-1.8)	-7,900 (-3.4)	-23,000 (-9.9)	-3,900 (-1.7)	-2,300 (-1.0)	4,400 (1.9)
Apr	---	-4,900 (-2.2)	-3,200 (-1.4)	-6,700 (-3.0)	-21,200 (-9.5)	-2,800 (-1.3)	-1,400 (-0.6)	5,200 (2.3)
May	---	-3,700 (-1.8)	-2,400 (-1.1)	-5,700 (-2.7)	-20,300 (-9.6)	-2,000 (-0.9)	-600 (-0.3)	6,000 (2.8)
Jun	---	-3,600 (-1.7)	-2,300 (-1.1)	-5,600 (-2.7)	-20,600 (-9.9)	-1,900 (-0.9)	-600 (-0.3)	6,100 (2.9)
Jul	---	-3,800 (-1.9)	-2,400 (-1.2)	-5,300 (-2.6)	-19,300 (-9.6)	-2,100 (-1.0)	-900 (-0.4)	5,600 (2.8)
Aug	---	-3,200 (-1.7)	-1,500 (-0.8)	-4,900 (-2.6)	-19,600 (-10.4)	-1,200 (-0.6)	0 (0.0)	6,500 (3.4)
Sep	---	-3,700 (-2.0)	-1,900 (-1.0)	-5,700 (-3.1)	-21,000 (-11.6)	-1,500 (-0.8)	-300 (-0.2)	6,400 (3.5)
Oct	---	-4,700 (-2.6)	-2,200 (-1.2)	-6,000 (-3.4)	-21,700 (-12.2)	-1,800 (-1.0)	-400 (-0.2)	5,800 (3.3)
Nov	---	-4,000 (-2.2)	-1,100 (-0.6)	-4,900 (-2.7)	-21,300 (-11.7)	-700 (-0.4)	700 (0.4)	7,100 (3.9)
Dec	---	-4,500 (-2.3)	-2,100 (-1.1)	-5,800 (-2.9)	-21,800 (-11.1)	-1,700 (-0.9)	-200 (-0.1)	6,200 (3.1)
Average	---	-4,500 (-2.2)	-2,600 (-1.3)	-6,100 (-3.0)	-21,300 (-10.5)	-2,200 (-1.1)	-800 (-0.4)	5,800 (2.9)

Table 178. Monthly Storage Contents Normal Year (2005) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	155,600	151,700	147,000	142,700	119,100	146,800	147,700	163,300
Feb	168,600	164,200	158,200	154,000	131,300	158,000	159,500	175,000
Mar	180,700	176,700	170,000	165,900	143,400	169,800	171,700	187,300
Apr	179,900	176,500	169,300	165,300	143,100	169,200	171,300	187,000
May	172,400	171,800	164,300	160,300	138,200	164,200	166,400	182,300
Jun	169,200	169,200	163,400	159,500	136,300	163,400	165,100	180,400
Jul	157,700	156,400	151,200	147,400	123,300	151,200	152,700	168,100
Aug	140,300	138,700	133,600	129,900	105,800	133,500	134,800	150,400
Sep	128,800	127,400	121,800	118,200	94,400	121,700	123,000	138,800
Oct	125,100	125,200	119,600	116,200	91,800	119,600	120,900	136,800
Nov	127,800	129,000	123,600	120,100	95,500	123,500	124,800	140,800
Dec	141,700	143,200	137,300	133,900	109,400	137,300	138,700	154,700
Average	153,900	152,400	146,500	142,700	119,200	146,400	148,000	163,700
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-4,700 (-3.1)	-9,000 (-5.9)	-32,600 (-21.5)	-4,900 (-3.2)	-4,000 (-2.6)	11,600 (7.6)
Feb	---	---	-6,000 (-3.7)	-10,200 (-6.2)	-32,900 (-20.0)	-6,200 (-3.8)	-4,700 (-2.9)	10,800 (6.6)
Mar	---	---	-6,700 (-3.8)	-10,800 (-6.1)	-33,300 (-18.8)	-6,900 (-3.9)	-5,000 (-2.8)	10,600 (6.0)
Apr	---	---	-7,200 (-4.1)	-11,200 (-6.3)	-33,400 (-18.9)	-7,300 (-4.1)	-5,200 (-2.9)	10,500 (5.9)
May	---	---	-7,500 (-4.4)	-11,500 (-6.7)	-33,600 (-19.6)	-7,600 (-4.4)	-5,400 (-3.1)	10,500 (6.1)
Jun	---	---	-5,800 (-3.4)	-9,700 (-5.7)	-32,900 (-19.4)	-5,800 (-3.4)	-4,100 (-2.4)	11,200 (6.6)
Jul	---	---	-5,200 (-3.3)	-9,000 (-5.8)	-33,100 (-21.2)	-5,200 (-3.3)	-3,700 (-2.4)	11,700 (7.5)
Aug	---	---	-5,100 (-3.7)	-8,800 (-6.3)	-32,900 (-23.7)	-5,200 (-3.7)	-3,900 (-2.8)	11,700 (8.4)
Sep	---	---	-5,600 (-4.4)	-9,200 (-7.2)	-33,000 (-25.9)	-5,700 (-4.5)	-4,400 (-3.5)	11,400 (8.9)
Oct	---	---	-5,600 (-4.5)	-9,000 (-7.2)	-33,400 (-26.7)	-5,600 (-4.5)	-4,300 (-3.4)	11,600 (9.3)
Nov	---	---	-5,400 (-4.2)	-8,900 (-6.9)	-33,500 (-26.0)	-5,500 (-4.3)	-4,200 (-3.3)	11,800 (9.1)
Dec	---	---	-5,900 (-4.1)	-9,300 (-6.5)	-33,800 (-23.6)	-5,900 (-4.1)	-4,500 (-3.1)	11,500 (8.0)
Average	---	---	-5,900 (-3.9)	-9,700 (-6.4)	-33,200 (-21.8)	-6,000 (-3.9)	-4,400 (-2.9)	11,300 (7.4)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-3,900 (-2.5)	-8,600 (-5.5)	-12,900 (-8.3)	-36,500 (-23.5)	-8,800 (-5.7)	-7,900 (-5.1)	7,700 (4.9)
Feb	---	-4,400 (-2.6)	-10,400 (-6.2)	-14,600 (-8.7)	-37,300 (-22.1)	-10,600 (-6.3)	-9,100 (-5.4)	6,400 (3.8)
Mar	---	-4,000 (-2.2)	-10,700 (-5.9)	-14,800 (-8.2)	-37,300 (-20.6)	-10,900 (-6.0)	-9,000 (-5.0)	6,600 (3.7)
Apr	---	-3,400 (-1.9)	-10,600 (-5.9)	-14,600 (-8.1)	-36,800 (-20.5)	-10,700 (-5.9)	-8,600 (-4.8)	7,100 (3.9)
May	---	-600 (-0.3)	-8,100 (-4.7)	-12,100 (-7.0)	-34,200 (-19.8)	-8,200 (-4.8)	-6,000 (-3.5)	9,900 (5.7)
Jun	---	0 (0.0)	-5,800 (-3.4)	-9,700 (-5.7)	-32,900 (-19.4)	-5,800 (-3.4)	-4,100 (-2.4)	11,200 (6.6)
Jul	---	-1,300 (-0.8)	-6,500 (-4.1)	-10,300 (-6.5)	-34,400 (-21.8)	-6,500 (-4.1)	-5,000 (-3.2)	10,400 (6.6)
Aug	---	-1,600 (-1.1)	-6,700 (-4.8)	-10,400 (-7.4)	-34,500 (-24.6)	-6,800 (-4.8)	-5,500 (-3.9)	10,100 (7.2)
Sep	---	-1,400 (-1.1)	-7,000 (-5.4)	-10,600 (-8.2)	-34,400 (-26.7)	-7,100 (-5.5)	-5,800 (-4.5)	10,000 (7.8)
Oct	---	100 (0.1)	-5,500 (-4.4)	-8,900 (-7.1)	-33,300 (-26.6)	-5,500 (-4.4)	-4,200 (-3.4)	11,700 (9.4)
Nov	---	1,200 (0.9)	-4,200 (-3.3)	-7,700 (-6.0)	-32,300 (-25.3)	-4,300 (-3.4)	-3,000 (-2.3)	13,000(10.2)
Dec	---	1,500 (1.1)	-4,400 (-3.1)	-7,800 (-5.5)	-32,300 (-22.8)	-4,400 (-3.1)	-3,000 (-2.1)	13,000 (9.2)
Average	---	-1,500 (-1.0)	-7,400 (-4.8)	-11,200 (-7.3)	-34,700 (-22.5)	-7,500 (-4.9)	-5,900 (-3.8)	9,800 (6.4)

Table 179. Monthly Storage Contents Wet Year (1997) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	257,100	256,900	259,200	259,300	254,000	259,200	259,600	260,200
Feb	265,200	264,000	265,700	265,800	261,400	265,700	266,200	266,800
Mar	267,200	265,400	267,400	267,500	262,900	267,400	268,000	268,800
Apr	235,000	235,700	237,800	237,800	233,900	237,800	238,500	239,200
May	223,400	225,200	226,000	226,200	222,900	225,900	226,600	227,600
Jun	222,900	225,100	224,100	224,000	222,900	224,000	224,700	226,500
Jul	234,600	237,700	235,600	235,300	233,600	235,500	236,100	238,800
Aug	232,200	235,600	232,800	232,400	231,000	232,600	233,200	236,100
Sep	228,700	231,200	228,400	228,000	226,000	228,200	228,900	232,000
Oct	226,200	228,600	226,200	225,900	222,700	226,000	226,700	230,100
Nov	224,800	228,800	225,300	224,900	222,900	225,000	225,700	229,300
Dec	232,900	237,200	232,300	231,900	231,200	232,000	232,900	236,600
Average	237,400	239,200	238,300	238,100	235,300	238,100	238,800	240,900
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	2,300 (0.9)	2,400 (0.9)	-2,900 (-1.1)	2,300 (0.9)	2,700 (1.1)	3,300 (1.3)
Feb	---	---	1,700 (0.6)	1,800 (0.7)	-2,600 (-1.0)	1,700 (0.6)	2,200 (0.8)	2,800 (1.1)
Mar	---	---	2,000 (0.8)	2,100 (0.8)	-2,500 (-0.9)	2,000 (0.8)	2,600 (1.0)	3,400 (1.3)
Apr	---	---	2,100 (0.9)	2,100 (0.9)	-1,800 (-0.8)	2,100 (0.9)	2,800 (1.2)	3,500 (1.5)
May	---	---	800 (0.4)	1,000 (0.4)	-2,300 (-1.0)	700 (0.3)	1,400 (0.6)	2,400 (1.1)
Jun	---	---	-1,000 (-0.4)	-1,100 (-0.5)	-2,200 (-1.0)	-1,100 (-0.5)	-400 (-0.2)	1,400 (0.6)
Jul	---	---	-2,100 (-0.9)	-2,400 (-1.0)	-4,100 (-1.7)	-2,200 (-0.9)	-1,600 (-0.7)	1,100 (0.5)
Aug	---	---	-2,800 (-1.2)	-3,200 (-1.4)	-4,600 (-2.0)	-3,000 (-1.3)	-2,400 (-1.0)	500 (0.2)
Sep	---	---	-2,800 (-1.2)	-3,200 (-1.4)	-5,200 (-2.2)	-3,000 (-1.3)	-2,300 (-1.0)	800 (0.3)
Oct	---	---	-2,400 (-1.0)	-2,700 (-1.2)	-5,900 (-2.6)	-2,600 (-1.1)	-1,900 (-0.8)	1,500 (0.7)
Nov	---	---	-3,500 (-1.5)	-3,900 (-1.7)	-5,900 (-2.6)	-3,800 (-1.7)	-3,100 (-1.4)	500 (0.2)
Dec	---	---	-4,900 (-2.1)	-5,300 (-2.2)	-6,000 (-2.5)	-5,200 (-2.2)	-4,300 (-1.8)	-600 (-0.3)
Average	---	---	-900 (-0.4)	-1,100 (-0.5)	-3,900 (-1.6)	-1,100 (-0.5)	-400 (-0.2)	1,700 (0.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-200 (-0.1)	2,100 (0.8)	2,200 (0.9)	-3,100 (-1.2)	2,100 (0.8)	2,500 (1.0)	3,100 (1.2)
Feb	---	-1,200 (-0.5)	500 (0.2)	600 (0.2)	-3,800 (-1.4)	500 (0.2)	1,000 (0.4)	1,600 (0.6)
Mar	---	-1,800 (-0.7)	200 (0.1)	300 (0.1)	-4,300 (-1.6)	200 (0.1)	800 (0.3)	1,600 (0.6)
Apr	---	700 (0.3)	2,800 (1.2)	2,800 (1.2)	-1,100 (-0.5)	2,800 (1.2)	3,500 (1.5)	4,200 (1.8)
May	---	1,800 (0.8)	2,600 (1.2)	2,800 (1.3)	-500 (-0.2)	2,500 (1.1)	3,200 (1.4)	4,200 (1.9)
Jun	---	2,200 (1.0)	1,200 (0.5)	1,100 (0.5)	0 (0.0)	1,100 (0.5)	1,800 (0.8)	3,600 (1.6)
Jul	---	3,100 (1.3)	1,000 (0.4)	700 (0.3)	-1,000 (-0.4)	900 (0.4)	1,500 (0.6)	4,200 (1.8)
Aug	---	3,400 (1.5)	600 (0.3)	200 (0.1)	-1,200 (-0.5)	400 (0.2)	1,000 (0.4)	3,900 (1.7)
Sep	---	2,500 (1.1)	-300 (-0.1)	-700 (-0.3)	-2,700 (-1.2)	-500 (-0.2)	200 (0.1)	3,300 (1.4)
Oct	---	2,400 (1.1)	0 (0.0)	-300 (-0.1)	-3,500 (-1.5)	-200 (-0.1)	500 (0.2)	3,900 (1.7)
Nov	---	4,000 (1.8)	500 (0.2)	100 (0.0)	-1,900 (-0.8)	200 (0.1)	900 (0.4)	4,500 (2.0)
Dec	---	4,300 (1.8)	-600 (-0.3)	-1,000 (-0.4)	-1,700 (-0.7)	-900 (-0.4)	0 (0.0)	3,700 (1.6)
Average	---	1,800 (0.8)	900 (0.4)	700 (0.3)	-2,100 (-0.9)	700 (0.3)	1,400 (0.6)	3,500 (1.5)

Table 180. Monthly Storage Contents Dry Year (2004) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	156,000	146,600	143,900	140,600	113,000	143,900	146,400	158,100
Feb	162,500	153,400	150,200	146,800	119,700	150,200	152,900	164,700
Mar	168,400	159,900	157,500	154,200	127,300	157,400	159,400	171,700
Apr	165,200	158,200	156,000	152,700	126,100	155,800	157,500	170,500
May	156,100	151,100	149,500	146,200	118,900	149,200	150,400	163,500
Jun	141,900	136,000	134,300	130,700	104,900	133,800	134,100	148,400
Jul	137,400	132,300	129,700	125,700	100,900	129,300	128,900	144,300
Aug	139,500	135,700	132,400	128,000	103,800	132,000	131,700	147,400
Sep	136,200	133,500	129,700	125,400	101,300	129,300	129,100	145,200
Oct	134,600	131,400	127,800	123,500	99,100	127,400	127,300	143,000
Nov	136,800	133,500	129,900	125,500	101,100	129,600	130,500	146,000
Dec	146,300	142,700	138,800	134,500	110,200	138,600	139,400	155,000
Average	148,300	142,800	139,900	136,100	110,500	139,600	140,600	154,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-2,700 (-1.8)	-6,000 (-4.1)	-33,600 (-22.9)	-2,700 (-1.8)	-200 (-0.1)	11,500 (7.8)
Feb	---	---	-3,200 (-2.1)	-6,600 (-4.3)	-33,700 (-22.0)	-3,200 (-2.1)	-500 (-0.3)	11,300 (7.4)
Mar	---	---	-2,400 (-1.5)	-5,700 (-3.6)	-32,600 (-20.4)	-2,500 (-1.6)	-500 (-0.3)	11,800 (7.4)
Apr	---	---	-2,200 (-1.4)	-5,500 (-3.5)	-32,100 (-20.3)	-2,400 (-1.5)	-700 (-0.4)	12,300 (7.8)
May	---	---	-1,600 (-1.1)	-4,900 (-3.2)	-32,200 (-21.3)	-1,900 (-1.3)	-700 (-0.5)	12,400 (8.2)
Jun	---	---	-1,700 (-1.3)	-5,300 (-3.9)	-31,100 (-22.9)	-2,200 (-1.6)	-1,900 (-1.4)	12,400 (9.1)
Jul	---	---	-2,600 (-2.0)	-6,600 (-5.0)	-31,400 (-23.7)	-3,000 (-2.3)	-3,400 (-2.6)	12,000 (9.1)
Aug	---	---	-3,300 (-2.4)	-7,700 (-5.7)	-31,900 (-23.5)	-3,700 (-2.7)	-4,000 (-2.9)	11,700 (8.6)
Sep	---	---	-3,800 (-2.8)	-8,100 (-6.1)	-32,200 (-24.1)	-4,200 (-3.1)	-4,400 (-3.3)	11,700 (8.8)
Oct	---	---	-3,600 (-2.7)	-7,900 (-6.0)	-32,300 (-24.6)	-4,000 (-3.0)	-4,100 (-3.1)	11,600 (8.8)
Nov	---	---	-3,600 (-2.7)	-8,000 (-6.0)	-32,400 (-24.3)	-3,900 (-2.9)	-3,000 (-2.2)	12,500 (9.4)
Dec	---	---	-3,900 (-2.7)	-8,200 (-5.7)	-32,500 (-22.8)	-4,100 (-2.9)	-3,300 (-2.3)	12,300 (8.6)
Average	---	---	-2,900 (-2.0)	-6,700 (-4.7)	-32,300 (-22.6)	-3,200 (-2.2)	-2,200 (-1.5)	12,000 (8.4)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-9,400 (-6.0)	-12,100 (-7.8)	-15,400 (-9.9)	-43,000 (-27.6)	-12,100 (-7.8)	-9,600 (-6.2)	2,100 (1.3)
Feb	---	-9,100 (-5.6)	-12,300 (-7.6)	-15,700 (-9.7)	-42,800 (-26.3)	-12,300 (-7.6)	-9,600 (-5.9)	2,200 (1.4)
Mar	---	-8,500 (-5.0)	-10,900 (-6.5)	-14,200 (-8.4)	-41,100 (-24.4)	-11,000 (-6.5)	-9,000 (-5.3)	3,300 (2.0)
Apr	---	-7,000 (-4.2)	-9,200 (-5.6)	-12,500 (-7.6)	-39,100 (-23.7)	-9,400 (-5.7)	-7,700 (-4.7)	5,300 (3.2)
May	---	-5,000 (-3.2)	-6,600 (-4.2)	-9,900 (-6.3)	-37,200 (-23.8)	-6,900 (-4.4)	-5,700 (-3.7)	7,400 (4.7)
Jun	---	-5,900 (-4.2)	-7,600 (-5.4)	-11,200 (-7.9)	-37,000 (-26.1)	-8,100 (-5.7)	-7,800 (-5.5)	6,500 (4.6)
Jul	---	-5,100 (-3.7)	-7,700 (-5.6)	-11,700 (-8.5)	-36,500 (-26.6)	-8,100 (-5.9)	-8,500 (-6.2)	6,900 (5.0)
Aug	---	-3,800 (-2.7)	-7,100 (-5.1)	-11,500 (-8.2)	-35,700 (-25.6)	-7,500 (-5.4)	-7,800 (-5.6)	7,900 (5.7)
Sep	---	-2,700 (-2.0)	-6,500 (-4.8)	-10,800 (-7.9)	-34,900 (-25.6)	-6,900 (-5.1)	-7,100 (-5.2)	9,000 (6.6)
Oct	---	-3,200 (-2.4)	-6,800 (-5.1)	-11,100 (-8.2)	-35,500 (-26.4)	-7,200 (-5.3)	-7,300 (-5.4)	8,400 (6.2)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Nov	---	-3,300 (-2.4)	-6,900 (-5.0)	-11,300 (-8.3)	-35,700 (-26.1)	-7,200 (-5.3)	-6,300 (-4.6)	9,200 (6.7)
Dec	---	-3,600 (-2.5)	-7,500 (-5.1)	-11,800 (-8.1)	-36,100 (-24.7)	-7,700 (-5.3)	-6,900 (-4.7)	8,700 (5.9)
Average	---	-5,500 (-3.7)	-8,400 (-5.7)	-12,200 (-8.2)	-37,800 (-25.5)	-8,700 (-5.9)	-7,700 (-5.2)	6,500 (4.4)

A time-series plot of direct effects simulated storage contents for each of the alternatives is shown in Figure 32. In general, all alternatives follow the same general pattern of annual drawdown and annual filling. Differences in simulated reservoir contents would be fairly consistent throughout the study period, with slightly more noticeable differences occurring during wet and dry years, such as the early 1980s and 2000s.

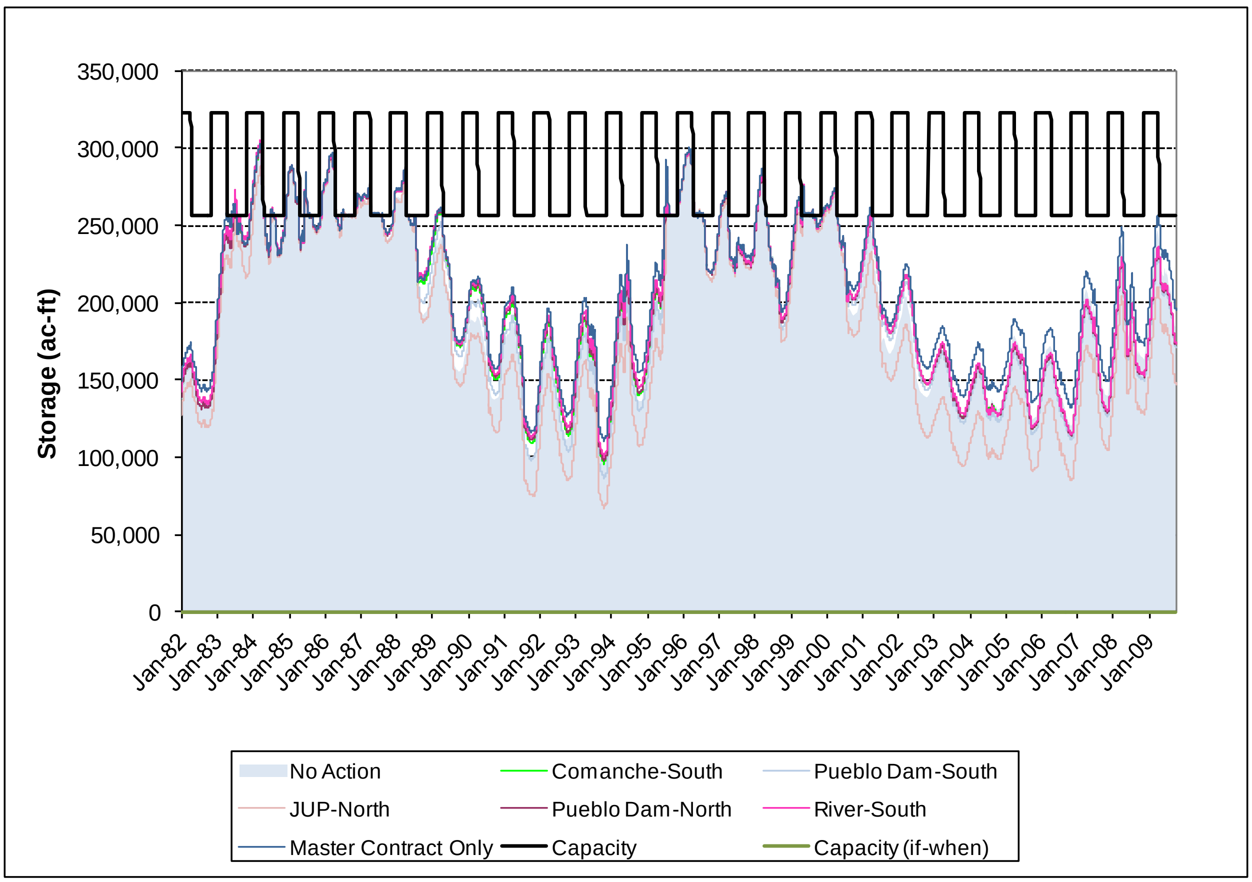

Figure 32. Storage Time Series Analysis – Pueblo Reservoir (Direct Effects).

Mean monthly overall cumulative effects analysis storage contents for Pueblo Reservoir is presented in Table 181 through Table 184, while a time series plot is presented in Figure 32. There is less storage in Pueblo Reservoir in the cumulative effects than the direct effects due to the high demand by large municipal entities simulated. Typical normal, wet and dry year effects of the action alternatives compared to the No Action are similar to the direct effects except, less pronounced for all alternatives except the Master Contract Only. The Master Contract Only shows slightly larger minor effects by percentage due to lower No Action storage. The other alternatives show less volumetric storage effects as well as lower effects by percentage. This is because storage in Pueblo Reservoir is more heavily influenced by the simulation of the large municipal entities than it is by the simulation of the AVC or the Master Contract. Therefore, the No Action Alternative looks more similar to the action alternatives in the cumulative effects.

With respect to climate change, it is assumed that Pueblo Reservoir would have more storage in the winter and spring months than shown in the tables below due to increased winter precipitation as rain and earlier snow melt runoff. Also, there would be greater effects during dry years due to decreased exchange potential between Fountain Creek and Pueblo Reservoir and increased storage and spills during wet years due to more anticipated flooding events.

Table 181. Monthly Storage Contents Overall Average – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	212,400	161,000	159,900	157,400	149,900	159,500	160,400	170,000
Feb	224,700	172,700	171,300	168,800	161,500	171,000	172,000	181,400
Mar	232,800	179,800	178,300	175,900	168,700	178,000	179,200	188,400
Apr	223,100	177,000	175,200	172,900	166,400	175,000	176,600	185,000
May	210,800	170,900	169,300	167,000	160,400	169,100	170,600	179,000
Jun	207,900	168,800	167,700	165,400	158,100	167,500	168,300	177,400
Jul	201,300	160,100	159,300	157,000	149,900	159,000	159,500	169,100
Aug	188,700	144,500	143,400	141,300	134,700	143,200	143,900	153,500
Sep	181,300	133,600	132,200	129,800	123,200	132,000	132,700	142,600
Oct	178,400	128,100	127,000	124,800	117,700	126,800	127,500	137,000
Nov	182,200	132,400	131,600	129,200	121,700	131,300	131,900	141,600
Dec	197,100	145,800	144,700	142,300	134,800	144,500	145,200	155,000
Average	203,300	156,100	154,900	152,600	145,500	154,600	155,600	164,900
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-1,100 (-0.7)	-3,600 (-2.2)	-11,100 (-6.9)	-1,500 (-0.9)	-600 (-0.4)	9,000 (5.6)
Feb	---	---	-1,400 (-0.8)	-3,900 (-2.3)	-11,200 (-6.5)	-1,700 (-1.0)	-700 (-0.4)	8,700 (5.0)
Mar	---	---	-1,500 (-0.8)	-3,900 (-2.2)	-11,100 (-6.2)	-1,800 (-1.0)	-600 (-0.3)	8,600 (4.8)
Apr	---	---	-1,800 (-1.0)	-4,100 (-2.3)	-10,600 (-6.0)	-2,000 (-1.1)	-400 (-0.2)	8,000 (4.5)
May	---	---	-1,600 (-0.9)	-3,900 (-2.3)	-10,500 (-6.1)	-1,800 (-1.1)	-300 (-0.2)	8,100 (4.7)
Jun	---	---	-1,100 (-0.7)	-3,400 (-2.0)	-10,700 (-6.3)	-1,300 (-0.8)	-500 (-0.3)	8,600 (5.1)
Jul	---	---	-800 (-0.5)	-3,100 (-1.9)	-10,200 (-6.4)	-1,100 (-0.7)	-600 (-0.4)	9,000 (5.6)
Aug	---	---	-1,100 (-0.8)	-3,200 (-2.2)	-9,800 (-6.8)	-1,300 (-0.9)	-600 (-0.4)	9,000 (6.2)
Sep	---	---	-1,400 (-1.0)	-3,800 (-2.8)	-10,400 (-7.8)	-1,600 (-1.2)	-900 (-0.7)	9,000 (6.7)
Oct	---	---	-1,100 (-0.9)	-3,300 (-2.6)	-10,400 (-8.1)	-1,300 (-1.0)	-600 (-0.5)	8,900 (6.9)
Nov	---	---	-800 (-0.6)	-3,200 (-2.4)	-10,700 (-8.1)	-1,100 (-0.8)	-500 (-0.4)	9,200 (6.9)
Dec	---	---	-1,100 (-0.8)	-3,500 (-2.4)	-11,000 (-7.5)	-1,300 (-0.9)	-600 (-0.4)	9,200 (6.3)
Average	---	---	-1,200 (-0.8)	-3,500 (-2.2)	-10,600 (-6.8)	-1,500 (-1.0)	-500 (-0.3)	8,800 (5.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-51,400 (-24.2)	-52,500 (-24.7)	-55,000 (-25.9)	-62,500 (-29.4)	-52,900 (-24.9)	-52,000 (-24.5)	-42,400 (-20.0)
Feb	---	-52,000 (-23.1)	-53,400 (-23.8)	-55,900 (-24.9)	-63,200 (-28.1)	-53,700 (-23.9)	-52,700 (-23.5)	-43,300 (-19.3)
Mar	---	-53,000 (-22.8)	-54,500 (-23.4)	-56,900 (-24.4)	-64,100 (-27.5)	-54,800 (-23.5)	-53,600 (-23.0)	-44,400 (-19.1)
Apr	---	-46,100 (-20.7)	-47,900 (-21.5)	-50,200 (-22.5)	-56,700 (-25.4)	-48,100 (-21.6)	-46,500 (-20.8)	-38,100 (-17.1)
May	---	-39,900 (-18.9)	-41,500 (-19.7)	-43,800 (-20.8)	-50,400 (-23.9)	-41,700 (-19.8)	-40,200 (-19.1)	-31,800 (-15.1)
Jun	---	-39,100 (-18.8)	-40,200 (-19.3)	-42,500 (-20.4)	-49,800 (-24.0)	-40,400 (-19.4)	-39,600 (-19.0)	-30,500 (-14.7)
Jul	---	-41,200 (-20.5)	-42,000 (-20.9)	-44,300 (-22.0)	-51,400 (-25.5)	-42,300 (-21.0)	-41,800 (-20.8)	-32,200 (-16.0)
Aug	---	-44,200 (-23.4)	-45,300 (-24.0)	-47,400 (-25.1)	-54,000 (-28.6)	-45,500 (-24.1)	-44,800 (-23.7)	-35,200 (-18.7)
Sep	---	-47,700 (-26.3)	-49,100 (-27.1)	-51,500 (-28.4)	-58,100 (-32.0)	-49,300 (-27.2)	-48,600 (-26.8)	-38,700 (-21.3)
Oct	---	-50,300 (-28.2)	-51,400 (-28.8)	-53,600 (-30.0)	-60,700 (-34.0)	-51,600 (-28.9)	-50,900 (-28.5)	-41,400 (-23.2)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Nov	---	-49,800 (-27.3)	-50,600 (-27.8)	-53,000 (-29.1)	-60,500 (-33.2)	-50,900 (-27.9)	-50,300 (-27.6)	-40,600 (-22.3)
Dec	---	-51,300 (-26.0)	-52,400 (-26.6)	-54,800 (-27.8)	-62,300 (-31.6)	-52,600 (-26.7)	-51,900 (-26.3)	-42,100 (-21.4)
Average	---	-47,200 (-23.2)	-48,400 (-23.8)	-50,700 (-24.9)	-57,800 (-28.4)	-48,700 (-24.0)	-47,700 (-23.5)	-38,400 (-18.9)

Table 182. Monthly Storage Contents Normal Year (2005) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	155,600	110,100	107,100	102,200	97,000	106,200	109,500	121,200
Feb	168,600	120,000	116,400	111,400	106,500	115,500	119,100	131,000
Mar	180,700	130,500	126,600	121,800	116,900	125,800	129,700	141,400
Apr	179,900	130,400	125,800	121,500	116,500	125,500	129,500	140,900
May	172,400	126,000	121,100	116,900	111,800	120,800	124,800	136,400
Jun	169,200	139,300	134,500	130,500	124,600	134,200	137,200	149,900
Jul	157,700	131,000	126,200	122,400	116,900	126,200	129,000	141,700
Aug	140,300	109,000	101,800	98,200	92,700	101,600	105,700	118,500
Sep	128,800	93,000	83,700	80,300	75,000	83,500	88,600	101,300
Oct	125,100	86,500	76,600	73,200	67,900	76,500	81,900	94,500
Nov	127,800	91,300	80,900	77,500	72,200	80,800	86,600	99,200
Dec	141,700	107,300	96,700	93,400	88,200	96,700	102,400	115,200
Average	153,900	114,500	108,100	104,100	98,800	107,700	112,000	124,200
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-3,000 (-2.7)	-7,900 (-7.2)	-13,100 (-11.9)	-3,900 (-3.5)	-600 (-0.5)	11,100 (10.1)
Feb	---	---	-3,600 (-3.0)	-8,600 (-7.2)	-13,500 (-11.3)	-4,500 (-3.8)	-900 (-0.8)	11,000 (9.2)
Mar	---	---	-3,900 (-3.0)	-8,700 (-6.7)	-13,600 (-10.4)	-4,700 (-3.6)	-800 (-0.6)	10,900 (8.4)
Apr	---	---	-4,600 (-3.5)	-8,900 (-6.8)	-13,900 (-10.7)	-4,900 (-3.8)	-900 (-0.7)	10,500 (8.1)
May	---	---	-4,900 (-3.9)	-9,100 (-7.2)	-14,200 (-11.3)	-5,200 (-4.1)	-1,200 (-1.0)	10,400 (8.3)
Jun	---	---	-4,800 (-3.4)	-8,800 (-6.3)	-14,700 (-10.6)	-5,100 (-3.7)	-2,100 (-1.5)	10,600 (7.6)
Jul	---	---	-4,800 (-3.7)	-8,600 (-6.6)	-14,100 (-10.8)	-4,800 (-3.7)	-2,000 (-1.5)	10,700 (8.2)
Aug	---	---	-7,200 (-6.6)	-10,800 (-9.9)	-16,300 (-15.0)	-7,400 (-6.8)	-3,300 (-3.0)	9,500 (8.7)
Sep	---	---	-9,300 (-10.0)	-12,700 (-13.7)	-18,000 (-19.4)	-9,500 (-10.2)	-4,400 (-4.7)	8,300 (8.9)
Oct	---	---	-9,900 (-11.4)	-13,300 (-15.4)	-18,600 (-21.5)	-10,000 (-11.6)	-4,600 (-5.3)	8,000 (9.2)
Nov	---	---	-10,400 (-11.4)	-13,800 (-15.1)	-19,100 (-20.9)	-10,500 (-11.5)	-4,700 (-5.1)	7,900 (8.7)
Dec	---	---	-10,600 (-9.9)	-13,900 (-13.0)	-19,100 (-17.8)	-10,600 (-9.9)	-4,900 (-4.6)	7,900 (7.4)
Average	---	---	-6,400 (-5.6)	-10,400 (-9.1)	-15,700 (-13.7)	-6,800 (-5.9)	-2,500 (-2.2)	9,700 (8.5)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-45,500 (-29.2)	-48,500 (-31.2)	-53,400 (-34.3)	-58,600 (-37.7)	-49,400 (-31.7)	-46,100 (-29.6)	-34,400 (-22.1)
Feb	---	-48,600 (-28.8)	-52,200 (-31.0)	-57,200 (-33.9)	-62,100 (-36.8)	-53,100 (-31.5)	-49,500 (-29.4)	-37,600 (-22.3)
Mar	---	-50,200 (-27.8)	-54,100 (-29.9)	-58,900 (-32.6)	-63,800 (-35.3)	-54,900 (-30.4)	-51,000 (-28.2)	-39,300 (-21.7)
Apr	---	-49,500 (-27.5)	-54,100 (-30.1)	-58,400 (-32.5)	-63,400 (-35.2)	-54,400 (-30.2)	-50,400 (-28.0)	-39,000 (-21.7)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
May	---	-46,400 (-26.9)	-51,300 (-29.8)	-55,500 (-32.2)	-60,600 (-35.2)	-51,600 (-29.9)	-47,600 (-27.6)	-36,000 (-20.9)
Jun	---	-29,900 (-17.7)	-34,700 (-20.5)	-38,700 (-22.9)	-44,600 (-26.4)	-35,000 (-20.7)	-32,000 (-18.9)	-19,300 (-11.4)
Jul	---	-26,700 (-16.9)	-31,500 (-20.0)	-35,300 (-22.4)	-40,800 (-25.9)	-31,500 (-20.0)	-28,700 (-18.2)	-16,000 (-10.1)
Aug	---	-31,300 (-22.3)	-38,500 (-27.4)	-42,100 (-30.0)	-47,600 (-33.9)	-38,700 (-27.6)	-34,600 (-24.7)	-21,800 (-15.5)
Sep	---	-35,800 (-27.8)	-45,100 (-35.0)	-48,500 (-37.7)	-53,800 (-41.8)	-45,300 (-35.2)	-40,200 (-31.2)	-27,500 (-21.4)
Oct	---	-38,600 (-30.9)	-48,500 (-38.8)	-51,900 (-41.5)	-57,200 (-45.7)	-48,600 (-38.8)	-43,200 (-34.5)	-30,600 (-24.5)
Nov	---	-36,500 (-28.6)	-46,900 (-36.7)	-50,300 (-39.4)	-55,600 (-43.5)	-47,000 (-36.8)	-41,200 (-32.2)	-28,600 (-22.4)
Dec	---	-34,400 (-24.3)	-45,000 (-31.8)	-48,300 (-34.1)	-53,500 (-37.8)	-45,000 (-31.8)	-39,300 (-27.7)	-26,500 (-18.7)
Average	---	-39,400 (-25.6)	-45,800 (-29.8)	-49,800 (-32.4)	-55,100 (-35.8)	-46,200 (-30.0)	-41,900 (-27.2)	-29,700 (-19.3)

Table 183. Monthly Storage Contents Wet Year (1997) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	257,100	247,800	248,600	249,100	249,300	248,900	249,300	250,000
Feb	265,200	259,500	259,700	259,800	259,800	259,700	260,000	260,500
Mar	267,200	265,100	265,200	265,200	265,100	265,200	265,500	266,000
Apr	235,000	253,700	253,700	253,400	253,600	253,700	254,200	254,300
May	223,400	241,900	242,600	242,200	241,800	242,700	242,400	243,000
Jun	222,900	226,100	225,700	225,200	225,100	225,800	224,500	228,200
Jul	234,600	224,400	224,800	224,200	224,000	224,900	223,300	228,800
Aug	232,200	217,000	216,700	216,000	216,100	216,600	215,300	220,300
Sep	228,700	210,600	209,300	208,800	209,100	209,000	208,400	213,400
Oct	226,200	206,400	204,300	204,000	204,200	203,900	204,300	209,300
Nov	224,800	210,700	209,300	208,900	208,200	208,800	209,100	214,100
Dec	232,900	217,400	216,800	216,300	214,600	216,300	216,300	221,500
Average	237,400	231,500	231,200	230,900	230,700	231,100	230,900	234,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	800 (0.3)	1,300 (0.5)	1,500 (0.6)	1,100 (0.4)	1,500 (0.6)	2,200 (0.9)
Feb	---	---	200 (0.1)	300 (0.1)	300 (0.1)	200 (0.1)	500 (0.2)	1,000 (0.4)
Mar	---	---	100 (0.0)	100 (0.0)	0 (0.0)	100 (0.0)	400 (0.2)	900 (0.3)
Apr	---	---	0 (0.0)	-300 (-0.1)	-100 (0.0)	0 (0.0)	500 (0.2)	600 (0.2)
May	---	---	700 (0.3)	300 (0.1)	-100 (0.0)	800 (0.3)	500 (0.2)	1,100 (0.5)
Jun	---	---	-400 (-0.2)	-900 (-0.4)	-1,000 (-0.4)	-300 (-0.1)	-1,600 (-0.7)	2,100 (0.9)
Jul	---	---	400 (0.2)	-200 (-0.1)	-400 (-0.2)	500 (0.2)	-1,100 (-0.5)	4,400 (2.0)
Aug	---	---	-300 (-0.1)	-1,000 (-0.5)	-900 (-0.4)	-400 (-0.2)	-1,700 (-0.8)	3,300 (1.5)
Sep	---	---	-1,300 (-0.6)	-1,800 (-0.9)	-1,500 (-0.7)	-1,600 (-0.8)	-2,200 (-1.0)	2,800 (1.3)
Oct	---	---	-2,100 (-1.0)	-2,400 (-1.2)	-2,200 (-1.1)	-2,500 (-1.2)	-2,100 (-1.0)	2,900 (1.4)
Nov	---	---	-1,400 (-0.7)	-1,800 (-0.9)	-2,500 (-1.2)	-1,900 (-0.9)	-1,600 (-0.8)	3,400 (1.6)
Dec	---	---	-600 (-0.3)	-1,100 (-0.5)	-2,800 (-1.3)	-1,100 (-0.5)	-1,100 (-0.5)	4,100 (1.9)
Average	---	---	-300 (-0.1)	-600 (-0.3)	-800 (-0.3)	-400 (-0.2)	-600 (-0.3)	2,500 (1.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-9,300 (-3.6)	-8,500 (-3.3)	-8,000 (-3.1)	-7,800 (-3.0)	-8,200 (-3.2)	-7,800 (-3.0)	-7,100 (-2.8)
Feb	---	-5,700 (-2.1)	-5,500 (-2.1)	-5,400 (-2.0)	-5,400 (-2.0)	-5,500 (-2.1)	-5,200 (-2.0)	-4,700 (-1.8)
Mar	---	-2,100 (-0.8)	-2,000 (-0.7)	-2,000 (-0.7)	-2,100 (-0.8)	-2,000 (-0.7)	-1,700 (-0.6)	-1,200 (-0.4)
Apr	---	18,700 (8.0)	18,700 (8.0)	18,400 (7.8)	18,600 (7.9)	18,700 (8.0)	19,200 (8.2)	19,300 (8.2)
May	---	18,500 (8.3)	19,200 (8.6)	18,800 (8.4)	18,400 (8.2)	19,300 (8.6)	19,000 (8.5)	19,600 (8.8)
Jun	---	3,200 (1.4)	2,800 (1.3)	2,300 (1.0)	2,200 (1.0)	2,900 (1.3)	1,600 (0.7)	5,300 (2.4)
Jul	---	-10,200 (-4.3)	-9,800 (-4.2)	-10,400 (-4.4)	-10,600 (-4.5)	-9,700 (-4.1)	-11,300 (-4.8)	-5,800 (-2.5)
Aug	---	-15,200 (-6.5)	-15,500 (-6.7)	-16,200 (-7.0)	-16,100 (-6.9)	-15,600 (-6.7)	-16,900 (-7.3)	-11,900 (-5.1)
Sep	---	-18,100 (-7.9)	-19,400 (-8.5)	-19,900 (-8.7)	-19,600 (-8.6)	-19,700 (-8.6)	-20,300 (-8.9)	-15,300 (-6.7)
Oct	---	-19,800 (-8.8)	-21,900 (-9.7)	-22,200 (-9.8)	-22,000 (-9.7)	-22,300 (-9.9)	-21,900 (-9.7)	-16,900 (-7.5)
Nov	---	-14,100 (-6.3)	-15,500 (-6.9)	-15,900 (-7.1)	-16,600 (-7.4)	-16,000 (-7.1)	-15,700 (-7.0)	-10,700 (-4.8)
Dec	---	-15,500 (-6.7)	-16,100 (-6.9)	-16,600 (-7.1)	-18,300 (-7.9)	-16,600 (-7.1)	-16,600 (-7.1)	-11,400 (-4.9)
Average	---	-5,900 (-2.5)	-6,200 (-2.6)	-6,500 (-2.7)	-6,700 (-2.8)	-6,300 (-2.7)	-6,500 (-2.7)	-3,400 (-1.4)

Table 184. Monthly Storage Contents Dry Year (2004) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	156,000	94,200	93,300	87,800	84,000	92,600	95,200	106,000
Feb	162,500	99,400	98,200	92,800	89,200	97,500	100,000	111,000
Mar	168,400	107,800	106,500	101,100	97,700	105,800	108,100	119,000
Apr	165,200	106,500	104,600	99,200	96,200	103,900	106,100	116,800
May	156,100	104,500	102,000	96,700	93,800	101,300	104,600	115,000
Jun	141,900	102,700	101,200	96,000	91,800	100,300	103,000	114,100
Jul	137,400	100,300	98,800	93,500	88,900	97,700	100,400	111,700
Aug	139,500	101,000	98,400	93,300	88,700	97,400	101,100	112,000
Sep	136,200	95,200	92,100	87,000	82,500	91,100	95,100	106,300
Oct	134,600	92,000	88,900	83,900	79,100	87,900	91,700	103,000
Nov	136,800	93,200	90,900	85,900	80,400	90,000	93,400	104,800
Dec	146,300	102,200	99,600	94,600	89,300	98,700	101,900	113,600
Average	148,300	99,900	97,900	92,700	88,500	97,000	100,100	111,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-900 (-1.0)	-6,400 (-6.8)	-10,200 (-10.8)	-1,600 (-1.7)	1,000 (1.1)	11,800 (12.5)
Feb	---	---	-1,200 (-1.2)	-6,600 (-6.6)	-10,200 (-10.3)	-1,900 (-1.9)	600 (0.6)	11,600 (11.7)
Mar	---	---	-1,300 (-1.2)	-6,700 (-6.2)	-10,100 (-9.4)	-2,000 (-1.9)	300 (0.3)	11,200 (10.4)
Apr	---	---	-1,900 (-1.8)	-7,300 (-6.9)	-10,300 (-9.7)	-2,600 (-2.4)	-400 (-0.4)	10,300 (9.7)
May	---	---	-2,500 (-2.4)	-7,800 (-7.5)	-10,700 (-10.2)	-3,200 (-3.1)	100 (0.1)	10,500 (10.0)
Jun	---	---	-1,500 (-1.5)	-6,700 (-6.5)	-10,900 (-10.6)	-2,400 (-2.3)	300 (0.3)	11,400 (11.1)
Jul	---	---	-1,500 (-1.5)	-6,800 (-6.8)	-11,400 (-11.4)	-2,600 (-2.6)	100 (0.1)	11,400 (11.4)
Aug	---	---	-2,600 (-2.6)	-7,700 (-7.6)	-12,300 (-12.2)	-3,600 (-3.6)	100 (0.1)	11,000 (10.9)
Sep	---	---	-3,100 (-3.3)	-8,200 (-8.6)	-12,700 (-13.3)	-4,100 (-4.3)	-100 (-0.1)	11,100 (11.7)
Oct	---	---	-3,100 (-3.4)	-8,100 (-8.8)	-12,900 (-14.0)	-4,100 (-4.5)	-300 (-0.3)	11,000 (12.0)
Nov	---	---	-2,300 (-2.5)	-7,300 (-7.8)	-12,800 (-13.7)	-3,200 (-3.4)	200 (0.2)	11,600 (12.4)
Dec	---	---	-2,600 (-2.5)	-7,600 (-7.4)	-12,900 (-12.6)	-3,500 (-3.4)	-300 (-0.3)	11,400 (11.2)
Average	---	---	-2,000 (-2.0)	-7,200 (-7.2)	-11,400 (-11.4)	-2,900 (-2.9)	200 (0.2)	11,200 (11.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-61,800 (-39.6)	-62,700 (-40.2)	-68,200 (-43.7)	-72,000 (-46.2)	-63,400 (-40.6)	-60,800 (-39.0)	-50,000 (-32.1)
Feb	---	-63,100 (-38.8)	-64,300 (-39.6)	-69,700 (-42.9)	-73,300 (-45.1)	-65,000 (-40.0)	-62,500 (-38.5)	-51,500 (-31.7)
Mar	---	-60,600 (-36.0)	-61,900 (-36.8)	-67,300 (-40.0)	-70,700 (-42.0)	-62,600 (-37.2)	-60,300 (-35.8)	-49,400 (-29.3)
Apr	---	-58,700 (-35.5)	-60,600 (-36.7)	-66,000 (-40.0)	-69,000 (-41.8)	-61,300 (-37.1)	-59,100 (-35.8)	-48,400 (-29.3)
May	---	-51,600 (-33.1)	-54,100 (-34.7)	-59,400 (-38.1)	-62,300 (-39.9)	-54,800 (-35.1)	-51,500 (-33.0)	-41,100 (-26.3)
Jun	---	-39,200 (-27.6)	-40,700 (-28.7)	-45,900 (-32.3)	-50,100 (-35.3)	-41,600 (-29.3)	-38,900 (-27.4)	-27,800 (-19.6)
Jul	---	-37,100 (-27.0)	-38,600 (-28.1)	-43,900 (-32.0)	-48,500 (-35.3)	-39,700 (-28.9)	-37,000 (-26.9)	-25,700 (-18.7)
Aug	---	-38,500 (-27.6)	-41,100 (-29.5)	-46,200 (-33.1)	-50,800 (-36.4)	-42,100 (-30.2)	-38,400 (-27.5)	-27,500 (-19.7)
Sep	---	-41,000 (-30.1)	-44,100 (-32.4)	-49,200 (-36.1)	-53,700 (-39.4)	-45,100 (-33.1)	-41,100 (-30.2)	-29,900 (-22.0)
Oct	---	-42,600 (-31.6)	-45,700 (-34.0)	-50,700 (-37.7)	-55,500 (-41.2)	-46,700 (-34.7)	-42,900 (-31.9)	-31,600 (-23.5)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Nov	---	-43,600 (-31.9)	-45,900 (-33.6)	-50,900 (-37.2)	-56,400 (-41.2)	-46,800 (-34.2)	-43,400 (-31.7)	-32,000 (-23.4)
Dec	---	-44,100 (-30.1)	-46,700 (-31.9)	-51,700 (-35.3)	-57,000 (-39.0)	-47,600 (-32.5)	-44,400 (-30.3)	-32,700 (-22.4)
Average	---	-48,400 (-32.6)	-50,400 (-34.0)	-55,600 (-37.5)	-59,800 (-40.3)	-51,300 (-34.6)	-48,200 (-32.5)	-37,200 (-25.1)

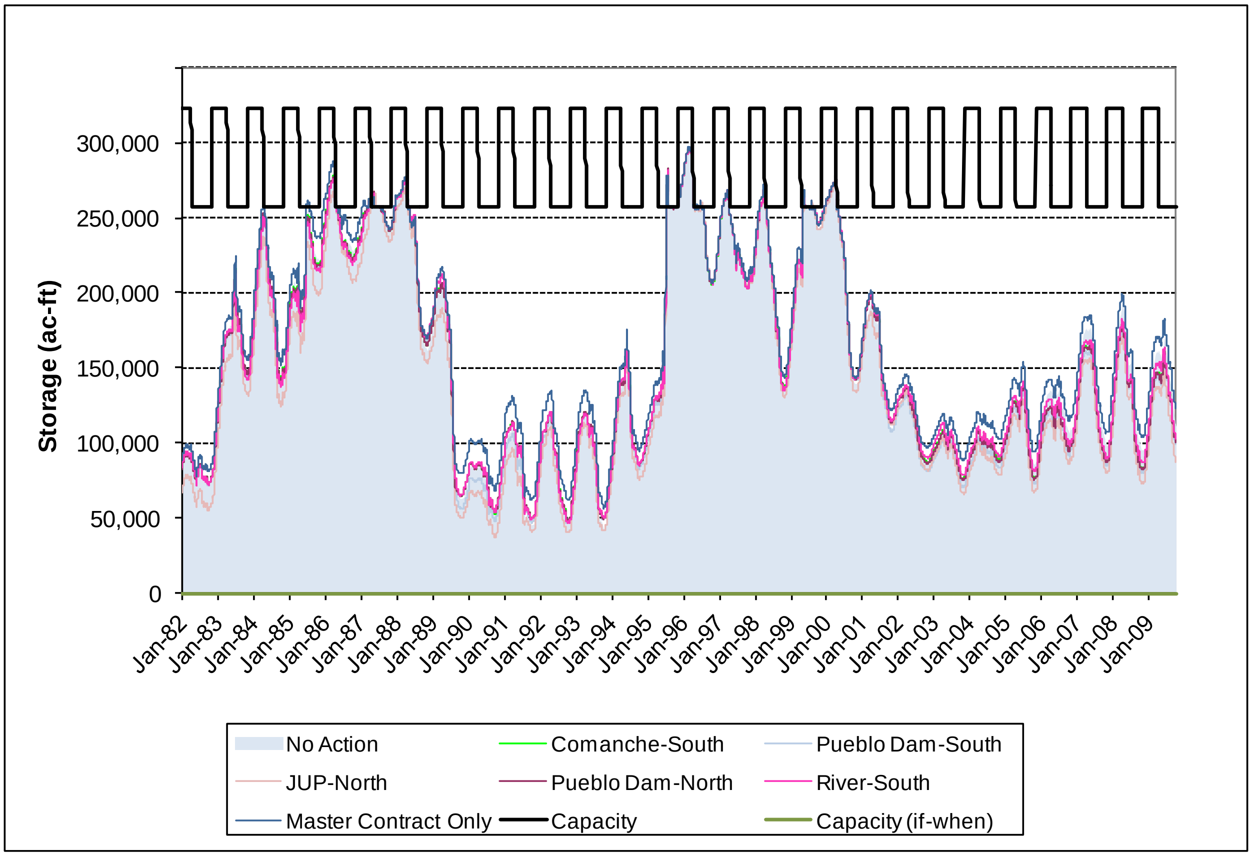

Figure 33. Storage Time-Series Analysis – Pueblo Reservoir (Cumulative Effects).

Simulated water surface elevation for Pueblo Reservoir is presented in Table 185 through Table 188 for the direct effects analysis, and Table 189 through Table 192 for the cumulative effects analysis. Simulated surface area for Pueblo Reservoir is presented in Table 193 through Table 196 for the direct effects analysis, and Table 197 through Table 200 for the cumulative effects analysis.

Table 185. Monthly Water Surface Elevation Overall Average – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,869.3	4,867.7	4,868.3	4,867.2	4,862.6	4,868.4	4,868.8	4,870.7
Feb	4,872.4	4,870.8	4,871.3	4,870.2	4,865.8	4,871.4	4,871.8	4,873.6
Mar	4,874.4	4,872.9	4,873.3	4,872.3	4,868.2	4,873.4	4,873.8	4,875.5
Apr	4,872.3	4,871.0	4,871.4	4,870.5	4,866.4	4,871.5	4,871.9	4,873.6
May	4,869.2	4,868.2	4,868.5	4,867.6	4,863.3	4,868.6	4,869.0	4,870.8
Jun	4,868.3	4,867.2	4,867.6	4,866.7	4,862.2	4,867.7	4,868.0	4,869.9
Jul	4,866.4	4,865.2	4,865.6	4,864.7	4,860.3	4,865.7	4,866.0	4,867.9
Aug	4,863.0	4,861.9	4,862.3	4,861.2	4,856.4	4,862.4	4,862.8	4,864.8
Sep	4,860.9	4,859.6	4,860.1	4,858.9	4,853.7	4,860.2	4,860.6	4,862.7
Oct	4,860.0	4,858.4	4,859.1	4,857.8	4,852.5	4,859.2	4,859.6	4,861.6
Nov	4,861.1	4,859.7	4,860.5	4,859.2	4,853.8	4,860.6	4,861.0	4,863.0
Dec	4,865.2	4,863.7	4,864.4	4,863.2	4,858.2	4,864.5	4,864.9	4,866.8
Average	4,866.9	4,865.5	4,866.0	4,865.0	4,860.3	4,866.1	4,866.5	4,868.4
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.6 (0.5)	-0.5 (-0.4)	-5.1 (-4.5)	0.7 (0.6)	1.1 (1.0)	3.0 (2.6)
Feb	---	---	0.5 (0.4)	-0.6 (-0.5)	-5.0 (-4.2)	0.6 (0.5)	1.0 (0.8)	2.8 (2.4)
Mar	---	---	0.4 (0.3)	-0.6 (-0.5)	-4.7 (-3.9)	0.5 (0.4)	0.9 (0.8)	2.6 (2.2)
Apr	---	---	0.4 (0.3)	-0.5 (-0.4)	-4.6 (-3.9)	0.5 (0.4)	0.9 (0.8)	2.6 (2.2)
May	---	---	0.3 (0.3)	-0.6 (-0.5)	-4.9 (-4.3)	0.4 (0.3)	0.8 (0.7)	2.6 (2.3)
Jun	---	---	0.4 (0.4)	-0.6 (-0.5)	-5.0 (-4.4)	0.5 (0.4)	0.8 (0.7)	2.7 (2.4)
Jul	---	---	0.4 (0.4)	-0.5 (-0.4)	-4.9 (-4.4)	0.5 (0.4)	0.8 (0.7)	2.7 (2.4)
Aug	---	---	0.4 (0.4)	-0.7 (-0.6)	-5.5 (-5.1)	0.5 (0.5)	0.9 (0.8)	2.9 (2.7)
Sep	---	---	0.5 (0.5)	-0.7 (-0.7)	-5.9 (-5.5)	0.6 (0.6)	1.0 (0.9)	3.1 (2.9)
Oct	---	---	0.7 (0.7)	-0.6 (-0.6)	-5.9 (-5.6)	0.8 (0.8)	1.2 (1.1)	3.2 (3.0)
Nov	---	---	0.7 (0.7)	-0.5 (-0.5)	-5.9 (-5.5)	0.9 (0.8)	1.3 (1.2)	3.3 (3.1)
Dec	---	---	0.7 (0.6)	-0.5 (-0.5)	-5.5 (-5.0)	0.8 (0.7)	1.2 (1.1)	3.1 (2.8)
Average	---	---	0.5 (0.4)	-0.6 (-0.5)	-5.2 (-4.7)	0.6 (0.5)	1.0 (0.9)	2.9 (2.6)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-1.5 (-1.3)	-0.9 (-0.8)	-2.0 (-1.7)	-6.6 (-5.7)	-0.8 (-0.7)	-0.4 (-0.3)	1.5 (1.3)
Feb	---	-1.6 (-1.3)	-1.1 (-0.9)	-2.2 (-1.8)	-6.6 (-5.5)	-1.0 (-0.8)	-0.6 (-0.5)	1.2 (1.0)
Mar	---	-1.5 (-1.2)	-1.1 (-0.9)	-2.1 (-1.7)	-6.2 (-5.1)	-1.0 (-0.8)	-0.6 (-0.5)	1.1 (0.9)
Apr	---	-1.3 (-1.1)	-0.9 (-0.8)	-1.8 (-1.5)	-5.9 (-4.9)	-0.8 (-0.7)	-0.4 (-0.3)	1.3 (1.1)
May	---	-1.0 (-0.9)	-0.7 (-0.6)	-1.6 (-1.4)	-5.9 (-5.1)	-0.6 (-0.5)	-0.2 (-0.2)	1.6 (1.4)
Jun	---	-1.1 (-1.0)	-0.7 (-0.6)	-1.7 (-1.5)	-6.1 (-5.3)	-0.6 (-0.5)	-0.3 (-0.3)	1.6 (1.4)
Jul	---	-1.2 (-1.1)	-0.8 (-0.7)	-1.7 (-1.5)	-6.1 (-5.4)	-0.7 (-0.6)	-0.4 (-0.4)	1.5 (1.3)
Aug	---	-1.1 (-1.0)	-0.7 (-0.6)	-1.8 (-1.6)	-6.6 (-6.0)	-0.6 (-0.5)	-0.2 (-0.2)	1.8 (1.6)
Sep	---	-1.3 (-1.2)	-0.8 (-0.7)	-2.0 (-1.9)	-7.2 (-6.7)	-0.7 (-0.6)	-0.3 (-0.3)	1.8 (1.7)
Oct	---	-1.6 (-1.5)	-0.9 (-0.8)	-2.2 (-2.1)	-7.5 (-7.0)	-0.8 (-0.7)	-0.4 (-0.4)	1.6 (1.5)
Nov	---	-1.4 (-1.3)	-0.7 (-0.6)	-1.9 (-1.8)	-7.3 (-6.8)	-0.5 (-0.5)	-0.1 (-0.1)	1.9 (1.8)
Dec	---	-1.5 (-1.3)	-0.8 (-0.7)	-2.0 (-1.8)	-7.0 (-6.2)	-0.7 (-0.6)	-0.3 (-0.3)	1.6 (1.4)
Average	---	-1.3 (-1.2)	-0.8 (-0.7)	-1.9 (-1.7)	-6.6 (-5.8)	-0.7 (-0.6)	-0.3 (-0.3)	1.5 (1.4)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 186. Monthly Water Surface Elevation Normal Year (2005) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	4,854.5	4,853.3		4,851.8		4,850.4		4,842.5		4,851.7		4,852.0		4,856.8	
Feb	4,858.3	4,857.0		4,855.2		4,854.0		4,846.7		4,855.2		4,855.6		4,860.2	
Mar	4,861.8	4,860.6		4,858.7		4,857.5		4,850.6		4,858.7		4,859.2		4,863.6	
Apr	4,861.5	4,860.6		4,858.5		4,857.4		4,850.5		4,858.5		4,859.1		4,863.5	
May	4,859.4	4,859.3		4,857.1		4,855.9		4,849.0		4,857.0		4,857.7		4,862.2	
Jun	4,858.5	4,858.5		4,856.8		4,855.6		4,848.3		4,856.8		4,857.3		4,861.7	
Jul	4,855.1	4,854.7		4,853.1		4,851.9		4,843.9		4,853.1		4,853.6		4,858.2	
Aug	4,849.6	4,849.1		4,847.4		4,846.2		4,837.6		4,847.4		4,847.8		4,852.9	
Sep	4,845.8	4,845.3		4,843.4		4,842.1		4,833.2		4,843.4		4,843.8		4,849.2	
Oct	4,844.6	4,844.6		4,842.6		4,841.4		4,832.1		4,842.6		4,843.1		4,848.5	
Nov	4,845.5	4,845.9		4,844.0		4,842.8		4,833.6		4,844.0		4,844.4		4,849.8	
Dec	4,850.1	4,850.6		4,848.7		4,847.5		4,838.9		4,848.6		4,849.1		4,854.2	
Average	4,853.7	4,853.3		4,851.4		4,850.2		4,842.2		4,851.4		4,851.9		4,856.7	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		-1.5	(-1.5)	-2.8	(-2.8)	-10.8	(-10.8)	-1.5	(-1.5)	-1.3	(-1.3)	3.5	(3.5)
Feb	---	---		-1.8	(-1.7)	-3.1	(-2.9)	-10.4	(-10.0)	-1.9	(-1.8)	-1.4	(-1.3)	3.1	(3.0)
Mar	---	---		-1.9	(-1.8)	-3.1	(-2.9)	-10.0	(-9.3)	-2.0	(-1.8)	-1.4	(-1.3)	2.9	(2.7)
Apr	---	---		-2.1	(-1.9)	-3.2	(-3.0)	-10.1	(-9.4)	-2.1	(-2.0)	-1.5	(-1.4)	2.9	(2.7)
May	---	---		-2.2	(-2.1)	-3.4	(-3.2)	-10.3	(-9.7)	-2.2	(-2.1)	-1.6	(-1.5)	2.9	(2.8)
Jun	---	---		-1.7	(-1.6)	-2.9	(-2.7)	-10.2	(-9.7)	-1.7	(-1.6)	-1.2	(-1.1)	3.2	(3.0)
Jul	---	---		-1.6	(-1.6)	-2.8	(-2.7)	-10.8	(-10.6)	-1.6	(-1.6)	-1.1	(-1.1)	3.5	(3.4)
Aug	---	---		-1.7	(-1.8)	-2.9	(-3.1)	-11.5	(-12.0)	-1.7	(-1.8)	-1.3	(-1.3)	3.7	(3.9)
Sep	---	---		-2.0	(-2.1)	-3.2	(-3.5)	-12.2	(-13.2)	-2.0	(-2.1)	-1.5	(-1.6)	3.8	(4.1)
Oct	---	---		-1.9	(-2.1)	-3.2	(-3.5)	-12.4	(-13.6)	-1.9	(-2.1)	-1.5	(-1.6)	3.9	(4.3)
Nov	---	---		-1.8	(-2.0)	-3.1	(-3.3)	-12.3	(-13.2)	-1.9	(-2.0)	-1.4	(-1.5)	3.9	(4.2)
Dec	---	---		-1.9	(-2.0)	-3.0	(-3.1)	-11.6	(-12.0)	-1.9	(-2.0)	-1.5	(-1.5)	3.6	(3.7)
Average	---	---		-1.8	(-1.8)	-3.1	(-3.0)	-11.0	(-11.0)	-1.9	(-1.9)	-1.4	(-1.4)	3.4	(3.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-1.2	(-1.2)	-2.7	(-2.6)	-4.0	(-4.0)	-12.0	(-11.8)	-2.7	(-2.7)	-2.5	(-2.4)	2.3	(2.3)
Feb	---	-1.3	(-1.2)	-3.1	(-2.9)	-4.3	(-4.1)	-11.7	(-11.1)	-3.1	(-3.0)	-2.7	(-2.6)	1.8	(1.7)
Mar	---	-1.1	(-1.0)	-3.0	(-2.8)	-4.2	(-3.9)	-11.1	(-10.2)	-3.1	(-2.8)	-2.6	(-2.3)	1.8	(1.6)
Apr	---	-0.9	(-0.9)	-3.0	(-2.8)	-4.2	(-3.8)	-11.0	(-10.1)	-3.0	(-2.8)	-2.4	(-2.2)	2.0	(1.8)
May	---	-0.2	(-0.2)	-2.4	(-2.2)	-3.5	(-3.3)	-10.5	(-9.8)	-2.4	(-2.2)	-1.7	(-1.6)	2.8	(2.6)
Jun	---	0.0	(0.0)	-1.7	(-1.6)	-2.9	(-2.7)	-10.2	(-9.7)	-1.7	(-1.6)	-1.2	(-1.1)	3.2	(3.0)
Jul	---	-0.4	(-0.4)	-2.0	(-2.0)	-3.2	(-3.1)	-11.2	(-11.0)	-2.0	(-2.0)	-1.5	(-1.5)	3.1	(3.0)
Aug	---	-0.5	(-0.5)	-2.2	(-2.3)	-3.4	(-3.6)	-12.1	(-12.5)	-2.3	(-2.3)	-1.8	(-1.9)	3.2	(3.3)
Sep	---	-0.5	(-0.5)	-2.4	(-2.6)	-3.7	(-4.0)	-12.7	(-13.7)	-2.5	(-2.7)	-2.0	(-2.2)	3.3	(3.6)
Oct	---	0.0	(0.0)	-1.9	(-2.1)	-3.2	(-3.5)	-12.4	(-13.6)	-1.9	(-2.1)	-1.5	(-1.6)	3.9	(4.3)
Nov	---	0.4	(0.4)	-1.4	(-1.6)	-2.6	(-2.9)	-11.9	(-12.8)	-1.5	(-1.6)	-1.0	(-1.1)	4.3	(4.7)
Dec	---	0.5	(0.5)	-1.4	(-1.5)	-2.6	(-2.6)	-11.2	(-11.5)	-1.4	(-1.5)	-1.0	(-1.0)	4.1	(4.2)
Average	---	-0.4	(-0.4)	-2.3	(-2.3)	-3.5	(-3.5)	-11.5	(-11.4)	-2.3	(-2.3)	-1.8	(-1.8)	3.0	(3.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 187. Monthly Water Surface Elevation Wet Year (1997) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,880.5	4,880.5	4,881.0	4,881.0	4,879.8	4,881.0	4,881.1	4,881.2
Feb	4,882.3	4,882.0	4,882.4	4,882.4	4,881.5	4,882.4	4,882.5	4,882.6
Mar	4,882.7	4,882.3	4,882.7	4,882.7	4,881.8	4,882.7	4,882.9	4,883.0
Apr	4,875.5	4,875.7	4,876.2	4,876.2	4,875.3	4,876.2	4,876.3	4,876.5
May	4,872.8	4,873.2	4,873.4	4,873.5	4,872.7	4,873.4	4,873.6	4,873.8
Jun	4,872.7	4,873.2	4,873.0	4,872.9	4,872.7	4,872.9	4,873.1	4,873.5
Jul	4,875.5	4,876.2	4,875.7	4,875.6	4,875.2	4,875.7	4,875.8	4,876.4
Aug	4,874.9	4,875.7	4,875.0	4,875.0	4,874.6	4,875.0	4,875.1	4,875.8
Sep	4,874.1	4,874.7	4,874.0	4,873.9	4,873.4	4,873.9	4,874.1	4,874.9
Oct	4,873.5	4,874.0	4,873.5	4,873.4	4,872.6	4,873.4	4,873.6	4,874.4
Nov	4,873.1	4,874.1	4,873.2	4,873.2	4,872.7	4,873.2	4,873.4	4,874.2
Dec	4,875.0	4,876.1	4,874.9	4,874.8	4,874.7	4,874.8	4,875.0	4,875.9
Average	4,876.0	4,876.5	4,876.2	4,876.2	4,875.6	4,876.2	4,876.4	4,876.9
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.5 (0.4)	0.5 (0.4)	-0.7 (-0.5)	0.5 (0.4)	0.6 (0.5)	0.7 (0.5)
Feb	---	---	0.4 (0.3)	0.4 (0.3)	-0.5 (-0.4)	0.4 (0.3)	0.5 (0.4)	0.6 (0.5)
Mar	---	---	0.4 (0.3)	0.4 (0.3)	-0.5 (-0.4)	0.4 (0.3)	0.5 (0.4)	0.7 (0.5)
Apr	---	---	0.5 (0.4)	0.5 (0.4)	-0.4 (-0.3)	0.5 (0.4)	0.6 (0.5)	0.8 (0.7)
May	---	---	0.2 (0.2)	0.3 (0.2)	-0.5 (-0.4)	0.2 (0.2)	0.4 (0.3)	0.6 (0.5)
Jun	---	---	-0.3 (-0.2)	-0.3 (-0.2)	-0.5 (-0.4)	-0.3 (-0.2)	-0.1 (-0.1)	0.3 (0.2)
Jul	---	---	-0.5 (-0.4)	-0.6 (-0.5)	-1.0 (-0.8)	-0.5 (-0.4)	-0.4 (-0.3)	0.2 (0.2)
Aug	---	---	-0.7 (-0.6)	-0.7 (-0.6)	-1.1 (-0.9)	-0.7 (-0.6)	-0.6 (-0.5)	0.1 (0.1)
Sep	---	---	-0.7 (-0.6)	-0.8 (-0.7)	-1.3 (-1.1)	-0.8 (-0.7)	-0.6 (-0.5)	0.2 (0.2)
Oct	---	---	-0.5 (-0.4)	-0.6 (-0.5)	-1.4 (-1.2)	-0.6 (-0.5)	-0.4 (-0.3)	0.4 (0.3)
Nov	---	---	-0.9 (-0.7)	-1.0 (-0.8)	-1.4 (-1.2)	-0.9 (-0.7)	-0.7 (-0.6)	0.1 (0.1)
Dec	---	---	-1.1 (-0.9)	-1.2 (-1.0)	-1.3 (-1.1)	-1.2 (-1.0)	-1.0 (-0.8)	-0.1 (-0.1)
Average	---	---	-0.2 (-0.2)	-0.3 (-0.2)	-0.9 (-0.7)	-0.3 (-0.2)	-0.1 (-0.1)	0.4 (0.3)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.0 (0.0)	0.5 (0.4)	0.5 (0.4)	-0.7 (-0.5)	0.5 (0.4)	0.6 (0.5)	0.7 (0.5)
Feb	---	-0.3 (-0.2)	0.1 (0.1)	0.1 (0.1)	-0.8 (-0.6)	0.1 (0.1)	0.2 (0.2)	0.3 (0.2)
Mar	---	-0.4 (-0.3)	0.0 (0.0)	0.0 (0.0)	-0.9 (-0.7)	0.0 (0.0)	0.1 (0.1)	0.3 (0.2)
Apr	---	0.2 (0.2)	0.7 (0.6)	0.7 (0.6)	-0.2 (-0.2)	0.7 (0.6)	0.8 (0.7)	1.0 (0.8)
May	---	0.4 (0.3)	0.6 (0.5)	0.7 (0.6)	-0.1 (-0.1)	0.6 (0.5)	0.8 (0.7)	1.0 (0.8)
Jun	---	0.5 (0.4)	0.2 (0.2)	0.2 (0.2)	0.0 (0.0)	0.2 (0.2)	0.4 (0.3)	0.8 (0.7)
Jul	---	0.7 (0.6)	0.2 (0.2)	0.1 (0.1)	-0.3 (-0.2)	0.2 (0.2)	0.3 (0.2)	0.9 (0.7)
Aug	---	0.8 (0.7)	0.1 (0.1)	0.1 (0.1)	-0.3 (-0.2)	0.1 (0.1)	0.2 (0.2)	0.9 (0.7)
Sep	---	0.6 (0.5)	-0.1 (-0.1)	-0.2 (-0.2)	-0.7 (-0.6)	-0.2 (-0.2)	0.0 (0.0)	0.8 (0.7)
Oct	---	0.5 (0.4)	0.0 (0.0)	-0.1 (-0.1)	-0.9 (-0.7)	-0.1 (-0.1)	0.1 (0.1)	0.9 (0.7)
Nov	---	1.0 (0.8)	0.1 (0.1)	0.0 (0.0)	-0.4 (-0.3)	0.1 (0.1)	0.3 (0.2)	1.1 (0.9)
Dec	---	1.0 (0.8)	-0.1 (-0.1)	-0.2 (-0.2)	-0.3 (-0.2)	-0.2 (-0.2)	0.0 (0.0)	0.9 (0.7)
Average	---	0.4 (0.3)	0.2 (0.2)	0.2 (0.1)	-0.5 (-0.4)	0.2 (0.1)	0.3 (0.3)	0.8 (0.7)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 188. Monthly Water Surface Elevation Dry Year (2004) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,854.6	4,851.7	4,850.8	4,849.7	4,840.3	4,850.8	4,851.6	4,855.2
Feb	4,856.5	4,853.8	4,852.8	4,851.7	4,842.7	4,852.8	4,853.6	4,857.2
Mar	4,858.3	4,855.8	4,855.1	4,854.0	4,845.3	4,855.0	4,855.6	4,859.2
Apr	4,857.3	4,855.3	4,854.6	4,853.6	4,844.9	4,854.5	4,855.0	4,858.9
May	4,854.6	4,853.1	4,852.6	4,851.5	4,842.4	4,852.5	4,852.8	4,856.8
Jun	4,850.2	4,848.2	4,847.7	4,846.5	4,837.3	4,847.5	4,847.6	4,852.2
Jul	4,848.7	4,847.0	4,846.1	4,844.8	4,835.7	4,846.0	4,845.9	4,850.9
Aug	4,849.4	4,848.1	4,847.0	4,845.6	4,836.9	4,846.9	4,846.8	4,851.9
Sep	4,848.3	4,847.4	4,846.1	4,844.7	4,835.9	4,846.0	4,845.9	4,851.2
Oct	4,847.8	4,846.7	4,845.5	4,844.0	4,835.0	4,845.3	4,845.3	4,850.5
Nov	4,848.5	4,847.4	4,846.2	4,844.7	4,835.8	4,846.1	4,846.4	4,851.5
Dec	4,851.6	4,850.4	4,849.1	4,847.7	4,839.2	4,849.1	4,849.4	4,854.3
Average	4,852.1	4,850.4	4,849.5	4,848.2	4,839.3	4,849.4	4,849.7	4,854.2
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.9 (-0.9)	-2.0 (-2.0)	-11.5 (-11.7)	-0.9 (-0.9)	-0.1 (-0.1)	3.5 (3.5)
Feb	---	---	-1.0 (-1.0)	-2.1 (-2.1)	-11.1 (-11.0)	-1.0 (-1.0)	-0.2 (-0.2)	3.4 (3.4)
Mar	---	---	-0.8 (-0.8)	-1.8 (-1.8)	-10.5 (-10.2)	-0.8 (-0.8)	-0.2 (-0.2)	3.4 (3.3)
Apr	---	---	-0.7 (-0.7)	-1.7 (-1.7)	-10.4 (-10.2)	-0.8 (-0.8)	-0.3 (-0.3)	3.6 (3.5)
May	---	---	-0.5 (-0.5)	-1.6 (-1.6)	-10.7 (-10.7)	-0.7 (-0.7)	-0.3 (-0.3)	3.7 (3.7)
Jun	---	---	-0.6 (-0.6)	-1.8 (-1.9)	-11.0 (-11.6)	-0.7 (-0.7)	-0.6 (-0.6)	4.0 (4.2)
Jul	---	---	-0.9 (-1.0)	-2.2 (-2.3)	-11.3 (-12.0)	-1.0 (-1.1)	-1.1 (-1.2)	3.9 (4.2)
Aug	---	---	-1.1 (-1.2)	-2.5 (-2.6)	-11.2 (-11.8)	-1.2 (-1.3)	-1.3 (-1.4)	3.8 (4.0)
Sep	---	---	-1.3 (-1.4)	-2.7 (-2.9)	-11.5 (-12.2)	-1.4 (-1.5)	-1.5 (-1.6)	3.8 (4.0)
Oct	---	---	-1.2 (-1.3)	-2.7 (-2.9)	-11.7 (-12.5)	-1.4 (-1.5)	-1.4 (-1.5)	3.8 (4.1)
Nov	---	---	-1.2 (-1.3)	-2.7 (-2.9)	-11.6 (-12.3)	-1.3 (-1.4)	-1.0 (-1.1)	4.1 (4.3)
Dec	---	---	-1.3 (-1.3)	-2.7 (-2.8)	-11.2 (-11.5)	-1.3 (-1.3)	-1.0 (-1.0)	3.9 (4.0)
Average	---	---	-1.0 (-1.0)	-2.2 (-2.3)	-11.1 (-11.4)	-1.0 (-1.1)	-0.7 (-0.8)	3.7 (3.8)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-2.9 (-2.9)	-3.8 (-3.7)	-4.9 (-4.8)	-14.4 (-14.2)	-3.8 (-3.7)	-3.0 (-3.0)	0.6 (0.6)
Feb	---	-2.7 (-2.6)	-3.7 (-3.6)	-4.8 (-4.6)	-13.8 (-13.3)	-3.7 (-3.6)	-2.9 (-2.8)	0.7 (0.7)
Mar	---	-2.5 (-2.4)	-3.3 (-3.1)	-4.3 (-4.1)	-13.0 (-12.4)	-3.3 (-3.1)	-2.7 (-2.6)	0.9 (0.9)
Apr	---	-2.0 (-1.9)	-2.7 (-2.6)	-3.7 (-3.6)	-12.4 (-11.9)	-2.8 (-2.7)	-2.3 (-2.2)	1.6 (1.5)
May	---	-1.5 (-1.5)	-2.0 (-2.0)	-3.1 (-3.1)	-12.2 (-12.0)	-2.2 (-2.2)	-1.8 (-1.8)	2.2 (2.2)
Jun	---	-2.0 (-2.1)	-2.6 (-2.7)	-3.8 (-3.9)	-13.0 (-13.4)	-2.7 (-2.8)	-2.6 (-2.7)	2.0 (2.1)
Jul	---	-1.7 (-1.8)	-2.6 (-2.7)	-3.9 (-4.1)	-13.0 (-13.6)	-2.7 (-2.8)	-2.8 (-2.9)	2.2 (2.3)
Aug	---	-1.3 (-1.3)	-2.4 (-2.5)	-3.8 (-3.9)	-12.5 (-13.0)	-2.5 (-2.6)	-2.6 (-2.7)	2.5 (2.6)
Sep	---	-0.9 (-0.9)	-2.2 (-2.3)	-3.6 (-3.8)	-12.4 (-13.0)	-2.3 (-2.4)	-2.4 (-2.5)	2.9 (3.0)
Oct	---	-1.1 (-1.2)	-2.3 (-2.4)	-3.8 (-4.0)	-12.8 (-13.5)	-2.5 (-2.6)	-2.5 (-2.6)	2.7 (2.9)
Nov	---	-1.1 (-1.2)	-2.3 (-2.4)	-3.8 (-4.0)	-12.7 (-13.3)	-2.4 (-2.5)	-2.1 (-2.2)	3.0 (3.1)
Dec	---	-1.2 (-1.2)	-2.5 (-2.5)	-3.9 (-4.0)	-12.4 (-12.6)	-2.5 (-2.5)	-2.2 (-2.2)	2.7 (2.7)
Average	---	-1.7 (-1.8)	-2.7 (-2.7)	-4.0 (-4.0)	-12.9 (-13.0)	-2.8 (-2.8)	-2.5 (-2.5)	2.0 (2.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 189. Monthly Water Surface Elevation Overall Average – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)														
Jan	4,869.3	4,853.8	4,853.4		4,852.5		4,850.0		4,853.3		4,853.7		4,856.8	
Feb	4,872.4	4,857.3	4,856.9		4,856.0		4,853.7		4,856.8		4,857.2		4,860.1	
Mar	4,874.4	4,859.4	4,858.9		4,858.1		4,855.9		4,858.9		4,859.3		4,862.1	
Apr	4,872.3	4,858.8	4,858.2		4,857.4		4,855.3		4,858.2		4,858.7		4,861.3	
May	4,869.2	4,857.0	4,856.5		4,855.6		4,853.4		4,856.4		4,856.9		4,859.6	
Jun	4,868.3	4,856.4	4,856.1		4,855.3		4,852.8		4,856.0		4,856.3		4,859.3	
Jul	4,866.4	4,853.2	4,853.0		4,852.1		4,849.6		4,852.9		4,853.1		4,856.4	
Aug	4,863.0	4,848.0	4,847.6		4,846.8		4,844.3		4,847.6		4,847.9		4,851.4	
Sep	4,860.9	4,844.3	4,843.8		4,842.8		4,840.1		4,843.8		4,844.1		4,847.9	
Oct	4,860.0	4,842.2	4,841.9		4,840.9		4,838.0		4,841.8		4,842.2		4,845.9	
Nov	4,861.1	4,844.0	4,843.8		4,842.7		4,839.8		4,843.7		4,843.9		4,847.6	
Dec	4,865.2	4,848.8	4,848.5		4,847.5		4,844.8		4,848.4		4,848.7		4,852.1	
Average	4,866.9	4,851.9	4,851.6		4,850.7		4,848.1		4,851.5		4,851.8		4,855.0	
Change in Water Surface Elevation Compared to No Action [ft (%)]														
Jan	---	---	-0.4	(-0.4)	-1.3	(-1.3)	-3.8	(-3.8)	-0.5	(-0.5)	-0.1	(-0.1)	3.0	(3.0)
Feb	---	---	-0.4	(-0.4)	-1.3	(-1.2)	-3.6	(-3.5)	-0.5	(-0.5)	-0.1	(-0.1)	2.8	(2.7)
Mar	---	---	-0.5	(-0.5)	-1.3	(-1.2)	-3.5	(-3.3)	-0.5	(-0.5)	-0.1	(-0.1)	2.7	(2.5)
Apr	---	---	-0.6	(-0.6)	-1.4	(-1.3)	-3.5	(-3.3)	-0.6	(-0.6)	-0.1	(-0.1)	2.5	(2.4)
May	---	---	-0.5	(-0.5)	-1.4	(-1.3)	-3.6	(-3.5)	-0.6	(-0.6)	-0.1	(-0.1)	2.6	(2.5)
Jun	---	---	-0.3	(-0.3)	-1.1	(-1.1)	-3.6	(-3.5)	-0.4	(-0.4)	-0.1	(-0.1)	2.8	(2.7)
Jul	---	---	-0.2	(-0.2)	-1.1	(-1.1)	-3.6	(-3.6)	-0.3	(-0.3)	-0.1	(-0.1)	3.2	(3.2)
Aug	---	---	-0.4	(-0.4)	-1.2	(-1.3)	-3.7	(-3.9)	-0.4	(-0.4)	-0.1	(-0.1)	3.4	(3.6)
Sep	---	---	-0.5	(-0.5)	-1.5	(-1.6)	-4.2	(-4.6)	-0.5	(-0.5)	-0.2	(-0.2)	3.6	(3.9)
Oct	---	---	-0.3	(-0.3)	-1.3	(-1.5)	-4.2	(-4.7)	-0.4	(-0.4)	-0.1	(-0.1)	3.7	(4.2)
Nov	---	---	-0.3	(-0.3)	-1.3	(-1.4)	-4.2	(-4.6)	-0.3	(-0.3)	-0.1	(-0.1)	3.6	(4.0)
Dec	---	---	-0.3	(-0.3)	-1.3	(-1.4)	-4.0	(-4.2)	-0.4	(-0.4)	-0.1	(-0.1)	3.3	(3.4)
Average	---	---	-0.4	(-0.4)	-1.3	(-1.3)	-3.8	(-3.8)	-0.4	(-0.5)	-0.1	(-0.1)	3.1	(3.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]														
Jan	---	-15.4 (-13.3)	-15.8	(-13.6)	-16.7	(-14.4)	-19.2	(-16.5)	-15.9	(-13.7)	-15.5	(-13.4)	-12.4	(-10.7)
Feb	---	-15.1 (-12.7)	-15.5	(-13.0)	-16.4	(-13.7)	-18.7	(-15.7)	-15.6	(-13.1)	-15.2	(-12.7)	-12.3	(-10.3)
Mar	---	-15.0 (-12.4)	-15.5	(-12.8)	-16.3	(-13.4)	-18.5	(-15.3)	-15.5	(-12.8)	-15.1	(-12.4)	-12.3	(-10.1)
Apr	---	-13.5 (-11.3)	-14.1	(-11.8)	-14.9	(-12.5)	-17.0	(-14.3)	-14.1	(-11.8)	-13.6	(-11.4)	-11.0	(-9.2)
May	---	-12.2 (-10.5)	-12.7	(-10.9)	-13.6	(-11.7)	-15.8	(-13.6)	-12.8	(-11.0)	-12.3	(-10.6)	-9.6	(-8.3)
Jun	---	-11.9 (-10.3)	-12.2	(-10.6)	-13.0	(-11.3)	-15.5	(-13.5)	-12.3	(-10.7)	-12.0	(-10.4)	-9.1	(-7.9)
Jul	---	-13.2 (-11.7)	-13.4	(-11.8)	-14.3	(-12.6)	-16.8	(-14.8)	-13.5	(-11.9)	-13.3	(-11.7)	-10.0	(-8.8)
Aug	---	-15.0 (-13.6)	-15.4	(-14.0)	-16.2	(-14.7)	-18.7	(-17.0)	-15.4	(-14.0)	-15.1	(-13.7)	-11.6	(-10.6)
Sep	---	-16.6 (-15.4)	-17.1	(-15.9)	-18.1	(-16.8)	-20.8	(-19.3)	-17.1	(-15.9)	-16.8	(-15.6)	-13.0	(-12.1)
Oct	---	-17.8 (-16.7)	-18.1	(-16.9)	-19.1	(-17.9)	-22.0	(-20.6)	-18.2	(-17.0)	-17.9	(-16.7)	-14.1	(-13.2)
Nov	---	-17.1 (-15.8)	-17.4	(-16.1)	-18.4	(-17.0)	-21.3	(-19.7)	-17.4	(-16.1)	-17.2	(-15.9)	-13.5	(-12.5)
Dec	---	-16.4 (-14.6)	-16.7	(-14.9)	-17.7	(-15.8)	-20.4	(-18.2)	-16.8	(-15.0)	-16.5	(-14.7)	-13.1	(-11.7)
Average	---	-14.9 (-13.1)	-15.3	(-13.5)	-16.2	(-14.3)	-18.7	(-16.5)	-15.4	(-13.5)	-15.0	(-13.2)	-11.8	(-10.4)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 190. Monthly Water Surface Elevation Normal Year (2005) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,854.5	4,839.2	4,838.1	4,836.2	4,834.2	4,837.8	4,839.0	4,843.2
Feb	4,858.3	4,842.7	4,841.5	4,839.7	4,837.9	4,841.2	4,842.4	4,846.5
Mar	4,861.8	4,846.4	4,845.1	4,843.4	4,841.7	4,844.8	4,846.1	4,850.0
Apr	4,861.5	4,846.3	4,844.8	4,843.3	4,841.5	4,844.7	4,846.1	4,849.8
May	4,859.4	4,844.9	4,843.2	4,841.7	4,839.8	4,843.0	4,844.4	4,848.4
Jun	4,858.5	4,849.3	4,847.7	4,846.4	4,844.4	4,847.6	4,848.6	4,852.7
Jul	4,855.1	4,846.5	4,844.9	4,843.6	4,841.6	4,844.9	4,845.9	4,850.1
Aug	4,849.6	4,838.8	4,836.0	4,834.6	4,832.5	4,836.0	4,837.5	4,842.2
Sep	4,845.8	4,832.6	4,828.7	4,827.2	4,824.9	4,828.6	4,830.8	4,835.9
Oct	4,844.6	4,830.0	4,825.6	4,824.0	4,821.5	4,825.5	4,828.0	4,833.2
Nov	4,845.5	4,831.9	4,827.5	4,826.0	4,823.6	4,827.5	4,830.0	4,835.1
Dec	4,850.1	4,838.1	4,834.1	4,832.8	4,830.6	4,834.1	4,836.3	4,841.0
Average	4,853.7	4,840.6	4,838.1	4,836.6	4,834.5	4,838.0	4,839.6	4,844.0
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-1.1 (-1.3)	-3.0 (-3.4)	-5.0 (-5.8)	-1.4 (-1.7)	-0.2 (-0.3)	4.0 (4.7)
Feb	---	---	-1.3 (-1.4)	-3.1 (-3.4)	-4.9 (-5.5)	-1.6 (-1.8)	-0.3 (-0.3)	3.8 (4.2)
Mar	---	---	-1.3 (-1.4)	-3.0 (-3.2)	-4.7 (-5.1)	-1.6 (-1.7)	-0.3 (-0.3)	3.6 (3.9)
Apr	---	---	-1.6 (-1.7)	-3.0 (-3.3)	-4.8 (-5.1)	-1.7 (-1.8)	-0.3 (-0.3)	3.5 (3.8)
May	---	---	-1.7 (-1.9)	-3.2 (-3.5)	-5.0 (-5.5)	-1.8 (-2.0)	-0.4 (-0.5)	3.5 (3.8)
Jun	---	---	-1.6 (-1.6)	-2.9 (-3.0)	-4.9 (-5.1)	-1.6 (-1.7)	-0.7 (-0.7)	3.4 (3.6)
Jul	---	---	-1.6 (-1.8)	-3.0 (-3.2)	-4.9 (-5.3)	-1.6 (-1.8)	-0.7 (-0.7)	3.5 (3.8)
Aug	---	---	-2.7 (-3.2)	-4.1 (-4.8)	-6.3 (-7.4)	-2.8 (-3.3)	-1.2 (-1.4)	3.5 (4.1)
Sep	---	---	-3.9 (-4.9)	-5.4 (-6.8)	-7.8 (-9.8)	-4.0 (-5.0)	-1.8 (-2.3)	3.3 (4.1)
Oct	---	---	-4.3 (-5.7)	-5.9 (-7.7)	-8.5 (-11.0)	-4.4 (-5.7)	-2.0 (-2.6)	3.3 (4.3)
Nov	---	---	-4.4 (-5.6)	-5.9 (-7.5)	-8.3 (-10.6)	-4.4 (-5.6)	-1.9 (-2.5)	3.2 (4.0)
Dec	---	---	-4.0 (-4.8)	-5.4 (-6.3)	-7.5 (-8.8)	-4.1 (-4.8)	-1.9 (-2.2)	2.9 (3.4)
Average	---	---	-2.5 (-2.8)	-4.0 (-4.6)	-6.1 (-6.9)	-2.6 (-3.0)	-1.0 (-1.1)	3.5 (4.0)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-15.3 (-15.1)	-16.4 (-16.1)	-18.2 (-18.0)	-20.2 (-20.0)	-16.7 (-16.5)	-15.5 (-15.3)	-11.3 (-11.1)
Feb	---	-15.6 (-14.8)	-16.8 (-16.0)	-18.6 (-17.7)	-20.5 (-19.5)	-17.2 (-16.3)	-15.9 (-15.1)	-11.8 (-11.2)
Mar	---	-15.4 (-14.1)	-16.7 (-15.4)	-18.4 (-16.9)	-20.1 (-18.5)	-17.0 (-15.6)	-15.6 (-14.4)	-11.8 (-10.8)
Apr	---	-15.2 (-14.0)	-16.8 (-15.4)	-18.2 (-16.8)	-20.0 (-18.4)	-16.9 (-15.5)	-15.5 (-14.3)	-11.7 (-10.8)
May	---	-14.6 (-13.7)	-16.3 (-15.3)	-17.8 (-16.7)	-19.6 (-18.4)	-16.4 (-15.4)	-15.0 (-14.1)	-11.1 (-10.4)
Jun	---	-9.2 (-8.7)	-10.8 (-10.2)	-12.1 (-11.5)	-14.1 (-13.4)	-10.9 (-10.3)	-9.9 (-9.4)	-5.8 (-5.5)
Jul	---	-8.5 (-8.4)	-10.2 (-10.0)	-11.5 (-11.3)	-13.4 (-13.2)	-10.2 (-10.0)	-9.2 (-9.0)	-5.0 (-4.9)
Aug	---	-10.9 (-11.3)	-13.6 (-14.1)	-15.0 (-15.5)	-17.2 (-17.8)	-13.7 (-14.2)	-12.1 (-12.5)	-7.4 (-7.7)
Sep	---	-13.2 (-14.3)	-17.1 (-18.5)	-18.6 (-20.1)	-21.0 (-22.6)	-17.2 (-18.5)	-15.0 (-16.2)	-9.9 (-10.7)
Oct	---	-14.6 (-16.0)	-19.0 (-20.7)	-20.5 (-22.5)	-23.1 (-25.2)	-19.0 (-20.8)	-16.6 (-18.1)	-11.3 (-12.4)
Nov	---	-13.6 (-14.7)	-18.0 (-19.5)	-19.5 (-21.1)	-21.9 (-23.7)	-18.0 (-19.5)	-15.5 (-16.8)	-10.4 (-11.3)
Dec	---	-11.9 (-12.3)	-16.0 (-16.5)	-17.3 (-17.9)	-19.5 (-20.1)	-16.0 (-16.5)	-13.8 (-14.2)	-9.1 (-9.3)
Average	---	-13.2 (-13.1)	-15.6 (-15.5)	-17.1 (-17.0)	-19.2 (-19.1)	-15.8 (-15.7)	-14.1 (-14.0)	-9.7 (-9.6)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 191. Monthly Water Surface Elevation Wet Year (1997) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	4,880.5	4,878.5		4,878.6		4,878.8		4,878.8		4,878.7		4,878.8		4,879.0	
Feb	4,882.3	4,881.0		4,881.1		4,881.1		4,881.1		4,881.1		4,881.1		4,881.3	
Mar	4,882.7	4,882.2		4,882.3		4,882.3		4,882.3		4,882.3		4,882.3		4,882.4	
Apr	4,875.5	4,879.8		4,879.8		4,879.7		4,879.7		4,879.8		4,879.9		4,879.9	
May	4,872.8	4,877.2		4,877.3		4,877.2		4,877.1		4,877.3		4,877.3		4,877.4	
Jun	4,872.7	4,873.4		4,873.3		4,873.2		4,873.2		4,873.4		4,873.1		4,873.9	
Jul	4,875.5	4,873.0		4,873.1		4,873.0		4,872.9		4,873.1		4,872.8		4,874.1	
Aug	4,874.9	4,871.2		4,871.2		4,871.0		4,871.0		4,871.1		4,870.8		4,872.0	
Sep	4,874.1	4,869.6		4,869.3		4,869.2		4,869.3		4,869.2		4,869.1		4,870.3	
Oct	4,873.5	4,868.6		4,868.0		4,868.0		4,868.0		4,867.9		4,868.0		4,869.3	
Nov	4,873.1	4,869.7		4,869.3		4,869.2		4,869.0		4,869.2		4,869.3		4,870.5	
Dec	4,875.0	4,871.3		4,871.2		4,871.0		4,870.6		4,871.0		4,871.0		4,872.3	
Average	4,876.0	4,874.6		4,874.5		4,874.5		4,874.4		4,874.5		4,874.5		4,875.2	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		0.1	(0.1)	0.3	(0.2)	0.3	(0.2)	0.2	(0.2)	0.3	(0.2)	0.5	(0.4)
Feb	---	---		0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.2	(0.2)
Mar	---	---		0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.2	(0.2)
Apr	---	---		0.0	(0.0)	-0.1	(-0.1)	-0.1	(-0.1)	0.0	(0.0)	0.1	(0.1)	0.1	(0.1)
May	---	---		0.1	(0.1)	0.0	(0.0)	-0.1	(-0.1)	0.1	(0.1)	0.1	(0.1)	0.2	(0.2)
Jun	---	---		-0.1	(-0.1)	-0.2	(-0.2)	-0.2	(-0.2)	0.0	(0.0)	-0.4	(-0.3)	0.5	(0.4)
Jul	---	---		0.1	(0.1)	0.0	(0.0)	-0.1	(-0.1)	0.1	(0.1)	-0.2	(-0.2)	1.1	(0.9)
Aug	---	---		-0.1	(-0.1)	-0.2	(-0.2)	-0.2	(-0.2)	-0.1	(-0.1)	-0.4	(-0.3)	0.8	(0.7)
Sep	---	---		-0.3	(-0.3)	-0.4	(-0.3)	-0.3	(-0.3)	-0.4	(-0.3)	-0.5	(-0.4)	0.7	(0.6)
Oct	---	---		-0.6	(-0.5)	-0.7	(-0.6)	-0.6	(-0.5)	-0.7	(-0.6)	-0.6	(-0.5)	0.7	(0.6)
Nov	---	---		-0.3	(-0.3)	-0.4	(-0.3)	-0.6	(-0.5)	-0.4	(-0.3)	-0.4	(-0.3)	0.9	(0.8)
Dec	---	---		-0.1	(-0.1)	-0.3	(-0.3)	-0.7	(-0.6)	-0.3	(-0.3)	-0.3	(-0.3)	1.0	(0.8)
Average	---	---		-0.1	(-0.1)	-0.1	(-0.1)	-0.2	(-0.2)	-0.1	(-0.1)	-0.2	(-0.1)	0.6	(0.5)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-2.0	(-1.6)	-1.9	(-1.5)	-1.7	(-1.3)	-1.7	(-1.3)	-1.8	(-1.4)	-1.7	(-1.3)	-1.5	(-1.2)
Feb	---	-1.3	(-1.0)	-1.2	(-0.9)	-1.2	(-0.9)	-1.2	(-0.9)	-1.2	(-0.9)	-1.2	(-0.9)	-1.1	(-0.9)
Mar	---	-0.5	(-0.4)	-0.4	(-0.3)	-0.4	(-0.3)	-0.4	(-0.3)	-0.4	(-0.3)	-0.4	(-0.3)	-0.3	(-0.2)
Apr	---	4.3	(3.5)	4.3	(3.5)	4.2	(3.4)	4.2	(3.4)	4.3	(3.5)	4.4	(3.6)	4.4	(3.6)
May	---	4.4	(3.7)	4.5	(3.8)	4.4	(3.7)	4.3	(3.6)	4.5	(3.8)	4.5	(3.8)	4.6	(3.8)
Jun	---	0.7	(0.6)	0.6	(0.5)	0.5	(0.4)	0.5	(0.4)	0.7	(0.6)	0.3	(0.3)	1.2	(1.0)
Jul	---	-2.5	(-2.0)	-2.4	(-2.0)	-2.5	(-2.0)	-2.6	(-2.1)	-2.4	(-2.0)	-2.7	(-2.2)	-1.4	(-1.1)
Aug	---	-3.7	(-3.0)	-3.8	(-3.1)	-3.9	(-3.2)	-3.9	(-3.2)	-3.8	(-3.1)	-4.1	(-3.4)	-2.9	(-2.4)
Sep	---	-4.5	(-3.7)	-4.8	(-4.0)	-4.9	(-4.0)	-4.8	(-4.0)	-4.9	(-4.0)	-5.0	(-4.1)	-3.8	(-3.1)
Oct	---	-4.9	(-4.1)	-5.5	(-4.6)	-5.6	(-4.7)	-5.5	(-4.6)	-5.6	(-4.7)	-5.5	(-4.6)	-4.2	(-3.5)
Nov	---	-3.5	(-2.9)	-3.8	(-3.2)	-3.9	(-3.3)	-4.1	(-3.4)	-3.9	(-3.3)	-3.9	(-3.3)	-2.6	(-2.2)
Dec	---	-3.7	(-3.0)	-3.8	(-3.1)	-4.0	(-3.3)	-4.4	(-3.6)	-4.0	(-3.3)	-4.0	(-3.3)	-2.7	(-2.2)
Average	---	-1.4	(-1.2)	-1.5	(-1.2)	-1.6	(-1.3)	-1.6	(-1.3)	-1.5	(-1.3)	-1.6	(-1.3)	-0.9	(-0.7)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 192. Monthly Water Surface Elevation Dry Year (2004) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,854.6	4,833.1	4,832.7	4,830.5	4,828.9	4,832.5	4,833.5	4,837.7
Feb	4,856.5	4,835.2	4,834.7	4,832.5	4,831.1	4,834.4	4,835.4	4,839.5
Mar	4,858.3	4,838.3	4,837.8	4,835.8	4,834.5	4,837.6	4,838.4	4,842.4
Apr	4,857.3	4,837.9	4,837.1	4,835.1	4,833.9	4,836.9	4,837.7	4,841.6
May	4,854.6	4,837.1	4,836.2	4,834.1	4,832.9	4,835.9	4,837.1	4,841.0
Jun	4,850.2	4,836.4	4,835.9	4,833.8	4,832.2	4,835.5	4,836.5	4,840.7
Jul	4,848.7	4,835.5	4,834.9	4,832.8	4,830.9	4,834.5	4,835.5	4,839.8
Aug	4,849.4	4,835.8	4,834.8	4,832.7	4,830.9	4,834.4	4,835.8	4,839.9
Sep	4,848.3	4,833.5	4,832.3	4,830.2	4,828.2	4,831.9	4,833.5	4,837.8
Oct	4,847.8	4,832.2	4,831.0	4,828.8	4,826.7	4,830.6	4,832.1	4,836.6
Nov	4,848.5	4,832.7	4,831.8	4,829.7	4,827.3	4,831.4	4,832.8	4,837.2
Dec	4,851.6	4,836.2	4,835.2	4,833.3	4,831.1	4,834.9	4,836.1	4,840.5
Average	4,852.1	4,835.3	4,834.5	4,832.4	4,830.7	4,834.2	4,835.4	4,839.5
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.4 (-0.5)	-2.6 (-3.3)	-4.2 (-5.3)	-0.6 (-0.8)	0.4 (0.5)	4.6 (5.7)
Feb	---	---	-0.5 (-0.6)	-2.7 (-3.3)	-4.1 (-5.0)	-0.8 (-1.0)	0.2 (0.2)	4.3 (5.2)
Mar	---	---	-0.5 (-0.6)	-2.5 (-2.9)	-3.8 (-4.5)	-0.7 (-0.8)	0.1 (0.1)	4.1 (4.8)
Apr	---	---	-0.8 (-0.9)	-2.8 (-3.3)	-4.0 (-4.7)	-1.0 (-1.2)	-0.2 (-0.2)	3.7 (4.4)
May	---	---	-0.9 (-1.1)	-3.0 (-3.6)	-4.2 (-5.0)	-1.2 (-1.4)	0.0 (0.0)	3.9 (4.6)
Jun	---	---	-0.5 (-0.6)	-2.6 (-3.1)	-4.3 (-5.2)	-0.9 (-1.1)	0.1 (0.1)	4.3 (5.2)
Jul	---	---	-0.6 (-0.7)	-2.7 (-3.3)	-4.6 (-5.6)	-1.0 (-1.2)	0.0 (0.0)	4.3 (5.2)
Aug	---	---	-1.1 (-1.3)	-3.1 (-3.7)	-5.0 (-6.0)	-1.4 (-1.7)	0.0 (0.0)	4.1 (5.0)
Sep	---	---	-1.2 (-1.5)	-3.3 (-4.1)	-5.3 (-6.6)	-1.6 (-2.0)	0.0 (0.0)	4.3 (5.3)
Oct	---	---	-1.2 (-1.5)	-3.4 (-4.3)	-5.5 (-7.0)	-1.6 (-2.0)	-0.1 (-0.1)	4.3 (5.4)
Nov	---	---	-0.9 (-1.1)	-3.0 (-3.8)	-5.4 (-6.8)	-1.3 (-1.6)	0.1 (0.1)	4.5 (5.7)
Dec	---	---	-1.0 (-1.2)	-2.9 (-3.5)	-5.1 (-6.1)	-1.3 (-1.6)	-0.1 (-0.1)	4.3 (5.2)
Average	---	---	-0.8 (-1.0)	-2.9 (-3.5)	-4.6 (-5.6)	-1.1 (-1.4)	0.0 (0.1)	4.2 (5.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-21.5 (-21.2)	-21.9 (-21.6)	-24.1 (-23.7)	-25.7 (-25.3)	-22.1 (-21.8)	-21.1 (-20.8)	-16.9 (-16.7)
Feb	---	-21.3 (-20.6)	-21.8 (-21.1)	-24.0 (-23.2)	-25.4 (-24.6)	-22.1 (-21.4)	-21.1 (-20.4)	-17.0 (-16.4)
Mar	---	-20.0 (-19.0)	-20.5 (-19.5)	-22.5 (-21.4)	-23.8 (-22.6)	-20.7 (-19.7)	-19.9 (-18.9)	-15.9 (-15.1)
Apr	---	-19.4 (-18.6)	-20.2 (-19.4)	-22.2 (-21.3)	-23.4 (-22.5)	-20.4 (-19.6)	-19.6 (-18.8)	-15.7 (-15.1)
May	---	-17.5 (-17.2)	-18.4 (-18.1)	-20.5 (-20.2)	-21.7 (-21.4)	-18.7 (-18.4)	-17.5 (-17.2)	-13.6 (-13.4)
Jun	---	-13.8 (-14.2)	-14.3 (-14.7)	-16.4 (-16.9)	-18.1 (-18.6)	-14.7 (-15.1)	-13.7 (-14.1)	-9.5 (-9.8)
Jul	---	-13.2 (-13.8)	-13.8 (-14.4)	-15.9 (-16.6)	-17.8 (-18.6)	-14.2 (-14.9)	-13.2 (-13.8)	-8.9 (-9.3)
Aug	---	-13.6 (-14.1)	-14.7 (-15.3)	-16.7 (-17.3)	-18.6 (-19.3)	-15.0 (-15.6)	-13.6 (-14.1)	-9.5 (-9.9)
Sep	---	-14.8 (-15.5)	-16.0 (-16.8)	-18.1 (-19.0)	-20.1 (-21.1)	-16.4 (-17.2)	-14.8 (-15.5)	-10.5 (-11.0)
Oct	---	-15.6 (-16.5)	-16.8 (-17.7)	-19.0 (-20.1)	-21.1 (-22.3)	-17.2 (-18.2)	-15.7 (-16.6)	-11.3 (-11.9)
Nov	---	-15.8 (-16.6)	-16.7 (-17.5)	-18.8 (-19.7)	-21.2 (-22.2)	-17.1 (-17.9)	-15.7 (-16.5)	-11.3 (-11.8)
Dec	---	-15.4 (-15.6)	-16.4 (-16.6)	-18.3 (-18.6)	-20.5 (-20.8)	-16.7 (-17.0)	-15.5 (-15.7)	-11.1 (-11.3)
Average	---	-16.8 (-17.0)	-17.6 (-17.8)	-19.7 (-19.9)	-21.5 (-21.7)	-17.9 (-18.1)	-16.8 (-16.9)	-12.6 (-12.7)

* Percent changes are calculated using a minimum reservoir water elevation of 4753.1 feet.

Table 193. Monthly Surface Area Overall Average – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	4,063	3,993		4,021		3,970		3,764		4,027		4,047		4,134	
Feb	4,218	4,142		4,165		4,115		3,909		4,170		4,191		4,279	
Mar	4,321	4,246		4,265		4,218		4,020		4,269		4,289		4,376	
Apr	4,216	4,152		4,174		4,129		3,934		4,179		4,197		4,284	
May	4,063	4,013		4,031		3,987		3,790		4,036		4,054		4,141	
Jun	4,020	3,970		3,989		3,944		3,748		3,994		4,010		4,100	
Jul	3,932	3,880		3,900		3,860		3,681		3,904		3,918		4,005	
Aug	3,768	3,726		3,746		3,703		3,516		3,751		3,767		3,853	
Sep	3,669	3,623		3,646		3,598		3,399		3,651		3,667		3,756	
Oct	3,631	3,570		3,602		3,554		3,351		3,608		3,626		3,708	
Nov	3,679	3,626		3,663		3,616		3,406		3,669		3,687		3,771	
Dec	3,868	3,803		3,835		3,785		3,587		3,840		3,859		3,948	
Average	3,954	3,895		3,920		3,873		3,675		3,925		3,943		4,029	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		28	(0.7)	-23	(-0.6)	-229	(-5.7)	34	(0.9)	54	(1.4)	141	(3.5)
Feb	---	---		23	(0.6)	-27	(-0.7)	-233	(-5.6)	28	(0.7)	49	(1.2)	137	(3.3)
Mar	---	---		19	(0.4)	-28	(-0.7)	-226	(-5.3)	24	(0.6)	43	(1.0)	130	(3.1)
Apr	---	---		22	(0.5)	-23	(-0.6)	-218	(-5.3)	27	(0.6)	45	(1.1)	132	(3.2)
May	---	---		19	(0.5)	-26	(-0.6)	-223	(-5.6)	23	(0.6)	41	(1.0)	129	(3.2)
Jun	---	---		19	(0.5)	-26	(-0.7)	-222	(-5.6)	23	(0.6)	40	(1.0)	130	(3.3)
Jul	---	---		20	(0.5)	-20	(-0.5)	-199	(-5.1)	24	(0.6)	38	(1.0)	125	(3.2)
Aug	---	---		20	(0.5)	-24	(-0.6)	-210	(-5.6)	25	(0.7)	41	(1.1)	127	(3.4)
Sep	---	---		23	(0.6)	-25	(-0.7)	-224	(-6.2)	28	(0.8)	44	(1.2)	133	(3.7)
Oct	---	---		32	(0.9)	-16	(-0.4)	-219	(-6.1)	37	(1.0)	55	(1.5)	138	(3.9)
Nov	---	---		37	(1.0)	-10	(-0.3)	-220	(-6.1)	43	(1.2)	61	(1.7)	145	(4.0)
Dec	---	---		31	(0.8)	-19	(-0.5)	-216	(-5.7)	37	(1.0)	56	(1.5)	145	(3.8)
Average	---	---		25	(0.6)	-22	(-0.6)	-220	(-5.6)	29	(0.8)	47	(1.2)	134	(3.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-71	(-1.7)	-43	(-1.0)	-94	(-2.3)	-299	(-7.4)	-37	(-0.9)	-16	(-0.4)	70	(1.7)
Feb	---	-77	(-1.8)	-53	(-1.3)	-104	(-2.5)	-310	(-7.3)	-48	(-1.1)	-28	(-0.7)	60	(1.4)
Mar	---	-75	(-1.7)	-56	(-1.3)	-103	(-2.4)	-301	(-7.0)	-52	(-1.2)	-32	(-0.7)	55	(1.3)
Apr	---	-64	(-1.5)	-42	(-1.0)	-87	(-2.1)	-282	(-6.7)	-37	(-0.9)	-19	(-0.5)	68	(1.6)
May	---	-50	(-1.2)	-32	(-0.8)	-76	(-1.9)	-273	(-6.7)	-27	(-0.7)	-9	(-0.2)	79	(1.9)
Jun	---	-50	(-1.2)	-31	(-0.8)	-76	(-1.9)	-272	(-6.8)	-26	(-0.7)	-10	(-0.2)	80	(2.0)
Jul	---	-52	(-1.3)	-32	(-0.8)	-72	(-1.8)	-251	(-6.4)	-28	(-0.7)	-14	(-0.4)	73	(1.9)
Aug	---	-42	(-1.1)	-21	(-0.6)	-65	(-1.7)	-251	(-6.7)	-17	(-0.5)	0	(0.0)	85	(2.3)
Sep	---	-47	(-1.3)	-23	(-0.6)	-72	(-1.9)	-271	(-7.4)	-19	(-0.5)	-3	(-0.1)	86	(2.3)
Oct	---	-60	(-1.7)	-28	(-0.8)	-76	(-2.1)	-280	(-7.7)	-23	(-0.6)	-5	(-0.1)	77	(2.1)
Nov	---	-53	(-1.4)	-15	(-0.4)	-63	(-1.7)	-273	(-7.4)	-10	(-0.3)	8	(0.2)	93	(2.5)
Dec	---	-65	(-1.7)	-33	(-0.9)	-83	(-2.1)	-281	(-7.3)	-27	(-0.7)	-9	(-0.2)	80	(2.1)
Average	---	-59	(-1.5)	-34	(-0.9)	-81	(-2.0)	-279	(-7.0)	-29	(-0.7)	-11	(-0.3)	75	(1.9)

Table 194. Monthly Surface Area Normal Year (2005) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,336	3,281	3,214	3,152	2,847	3,211	3,223	3,442
Feb	3,512	3,453	3,371	3,314	2,994	3,369	3,390	3,598
Mar	3,675	3,620	3,531	3,476	3,162	3,528	3,553	3,764
Apr	3,664	3,618	3,522	3,469	3,156	3,520	3,548	3,761
May	3,563	3,555	3,455	3,401	3,089	3,453	3,484	3,696
Jun	3,521	3,521	3,443	3,389	3,063	3,443	3,466	3,671
Jul	3,364	3,345	3,273	3,218	2,896	3,273	3,294	3,505
Aug	3,118	3,097	3,026	2,976	2,706	3,024	3,043	3,262
Sep	2,961	2,942	2,876	2,837	2,565	2,875	2,890	3,098
Oct	2,911	2,912	2,853	2,815	2,526	2,852	2,867	3,071
Nov	2,947	2,962	2,897	2,858	2,581	2,896	2,911	3,125
Dec	3,138	3,160	3,078	3,030	2,744	3,076	3,097	3,323
Average	3,309	3,289	3,212	3,161	2,861	3,210	3,230	3,443
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-67 (-2.1)	-129 (-3.9)	-434 (-13.2)	-70 (-2.1)	-58 (-1.8)	161 (4.9)
Feb	---	---	-82 (-2.4)	-139 (-4.0)	-459 (-13.3)	-84 (-2.4)	-63 (-1.8)	145 (4.2)
Mar	---	---	-89 (-2.5)	-143 (-4.0)	-458 (-12.7)	-92 (-2.5)	-67 (-1.8)	144 (4.0)
Apr	---	---	-96 (-2.7)	-149 (-4.1)	-462 (-12.8)	-98 (-2.7)	-70 (-1.9)	143 (3.9)
May	---	---	-100 (-2.8)	-154 (-4.3)	-466 (-13.1)	-101 (-2.8)	-71 (-2.0)	142 (4.0)
Jun	---	---	-78 (-2.2)	-132 (-3.7)	-458 (-13.0)	-78 (-2.2)	-55 (-1.6)	150 (4.3)
Jul	---	---	-72 (-2.2)	-127 (-3.8)	-450 (-13.5)	-73 (-2.2)	-51 (-1.5)	160 (4.8)
Aug	---	---	-71 (-2.3)	-120 (-3.9)	-391 (-12.6)	-73 (-2.4)	-54 (-1.7)	166 (5.3)
Sep	---	---	-67 (-2.3)	-105 (-3.6)	-377 (-12.8)	-67 (-2.3)	-52 (-1.8)	156 (5.3)
Oct	---	---	-59 (-2.0)	-97 (-3.3)	-386 (-13.3)	-60 (-2.0)	-45 (-1.5)	159 (5.5)
Nov	---	---	-65 (-2.2)	-104 (-3.5)	-381 (-12.9)	-66 (-2.2)	-51 (-1.7)	163 (5.5)
Dec	---	---	-82 (-2.6)	-130 (-4.1)	-416 (-13.2)	-83 (-2.6)	-63 (-2.0)	163 (5.2)
Average	---	---	-77 (-2.3)	-127 (-3.9)	-428 (-13.0)	-79 (-2.4)	-58 (-1.8)	154 (4.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-55 (-1.6)	-122 (-3.7)	-184 (-5.5)	-489 (-14.7)	-125 (-3.7)	-113 (-3.4)	106 (3.2)
Feb	---	-59 (-1.7)	-141 (-4.0)	-198 (-5.6)	-518 (-14.7)	-143 (-4.1)	-123 (-3.5)	86 (2.5)
Mar	---	-55 (-1.5)	-145 (-3.9)	-199 (-5.4)	-514 (-14.0)	-147 (-4.0)	-122 (-3.3)	89 (2.4)
Apr	---	-46 (-1.2)	-142 (-3.9)	-195 (-5.3)	-508 (-13.9)	-144 (-3.9)	-116 (-3.2)	97 (2.7)
May	---	-8 (-0.2)	-108 (-3.0)	-162 (-4.5)	-474 (-13.3)	-109 (-3.1)	-79 (-2.2)	134 (3.8)
Jun	---	0 (0.0)	-78 (-2.2)	-132 (-3.7)	-458 (-13.0)	-78 (-2.2)	-55 (-1.6)	150 (4.3)
Jul	---	-19 (-0.6)	-91 (-2.7)	-146 (-4.3)	-469 (-13.9)	-92 (-2.7)	-70 (-2.1)	141 (4.2)
Aug	---	-22 (-0.7)	-93 (-3.0)	-142 (-4.6)	-412 (-13.2)	-94 (-3.0)	-76 (-2.4)	144 (4.6)
Sep	---	-19 (-0.6)	-85 (-2.9)	-123 (-4.2)	-396 (-13.4)	-86 (-2.9)	-71 (-2.4)	137 (4.6)
Oct	---	0 (0.0)	-58 (-2.0)	-96 (-3.3)	-386 (-13.2)	-59 (-2.0)	-45 (-1.5)	159 (5.5)
Nov	---	15 (0.5)	-50 (-1.7)	-89 (-3.0)	-366 (-12.4)	-51 (-1.7)	-36 (-1.2)	178 (6.0)
Dec	---	22 (0.7)	-61 (-1.9)	-108 (-3.5)	-394 (-12.6)	-62 (-2.0)	-42 (-1.3)	185 (5.9)
Average	---	-20 (-0.6)	-98 (-3.0)	-148 (-4.5)	-448 (-13.6)	-99 (-3.0)	-79 (-2.4)	134 (4.0)

Table 195. Monthly Surface Area Wet Year (1997) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)														
Jan	4,650	4,649	4,674		4,675		4,616		4,674		4,677		4,683	
Feb	4,725	4,713	4,731		4,732		4,686		4,731		4,736		4,742	
Mar	4,747	4,729	4,748		4,748		4,705		4,748		4,753		4,761	
Apr	4,383	4,392	4,420		4,419		4,367		4,420		4,429		4,438	
May	4,231	4,256	4,266		4,269		4,224		4,266		4,275		4,289	
Jun	4,223	4,255	4,240		4,240		4,223		4,239		4,248		4,273	
Jul	4,383	4,420	4,395		4,391		4,369		4,393		4,401		4,432	
Aug	4,352	4,395	4,360		4,355		4,335		4,357		4,365		4,402	
Sep	4,304	4,338	4,300		4,295		4,267		4,297		4,306		4,349	
Oct	4,269	4,302	4,270		4,265		4,221		4,267		4,277		4,323	
Nov	4,250	4,305	4,257		4,251		4,224		4,252		4,263		4,312	
Dec	4,357	4,412	4,350		4,345		4,335		4,346		4,357		4,404	
Average	4,406	4,430	4,417		4,415		4,381		4,416		4,424		4,451	
Change in Surface Area Compared to No Action [acres (%)]														
Jan	---	---	25	(0.5)	26	(0.6)	-33	(-0.7)	25	(0.5)	29	(0.6)	34	(0.7)
Feb	---	---	18	(0.4)	19	(0.4)	-27	(-0.6)	18	(0.4)	23	(0.5)	29	(0.6)
Mar	---	---	19	(0.4)	19	(0.4)	-24	(-0.5)	18	(0.4)	24	(0.5)	32	(0.7)
Apr	---	---	28	(0.6)	27	(0.6)	-25	(-0.6)	28	(0.6)	37	(0.8)	46	(1.0)
May	---	---	11	(0.3)	14	(0.3)	-32	(-0.7)	10	(0.2)	20	(0.5)	33	(0.8)
Jun	---	---	-15	(-0.4)	-15	(-0.4)	-31	(-0.7)	-15	(-0.4)	-7	(-0.2)	19	(0.4)
Jul	---	---	-25	(-0.6)	-29	(-0.6)	-51	(-1.1)	-27	(-0.6)	-19	(-0.4)	12	(0.3)
Aug	---	---	-35	(-0.8)	-40	(-0.9)	-60	(-1.4)	-39	(-0.9)	-30	(-0.7)	7	(0.1)
Sep	---	---	-38	(-0.9)	-43	(-1.0)	-71	(-1.6)	-41	(-0.9)	-32	(-0.7)	11	(0.3)
Oct	---	---	-32	(-0.8)	-37	(-0.9)	-82	(-1.9)	-36	(-0.8)	-26	(-0.6)	20	(0.5)
Nov	---	---	-49	(-1.1)	-54	(-1.3)	-82	(-1.9)	-53	(-1.2)	-42	(-1.0)	6	(0.1)
Dec	---	---	-62	(-1.4)	-67	(-1.5)	-76	(-1.7)	-66	(-1.5)	-55	(-1.2)	-7	(-0.2)
Average	---	---	-13	(-0.3)	-15	(-0.3)	-49	(-1.1)	-15	(-0.3)	-6	(-0.1)	20	(0.5)
Change in Surface Area Compared to Existing Conditions [acres (%)]														
Jan	---	---	24	(0.5)	24	(0.5)	-35	(-0.8)	23	(0.5)	27	(0.6)	33	(0.7)
Feb	---	---	6	(0.1)	6	(0.1)	-39	(-0.8)	5	(0.1)	10	(0.2)	17	(0.4)
Mar	---	---	1	(0.0)	1	(0.0)	-42	(-0.9)	0	(0.0)	6	(0.1)	14	(0.3)
Apr	---	---	37	(0.8)	37	(0.8)	-15	(-0.3)	37	(0.8)	46	(1.1)	55	(1.3)
May	---	---	35	(0.8)	38	(0.9)	-7	(-0.2)	35	(0.8)	44	(1.0)	58	(1.4)
Jun	---	---	16	(0.4)	16	(0.4)	0	(0.0)	16	(0.4)	25	(0.6)	50	(1.2)
Jul	---	---	12	(0.3)	9	(0.2)	-13	(-0.3)	10	(0.2)	18	(0.4)	50	(1.1)
Aug	---	---	7	(0.2)	3	(0.1)	-17	(-0.4)	4	(0.1)	13	(0.3)	49	(1.1)
Sep	---	---	-5	(-0.1)	-10	(-0.2)	-38	(-0.9)	-8	(-0.2)	2	(0.0)	44	(1.0)
Oct	---	---	1	(0.0)	-4	(-0.1)	-49	(-1.1)	-2	(-0.1)	8	(0.2)	53	(1.2)
Nov	---	---	6	(0.1)	1	(0.0)	-27	(-0.6)	2	(0.0)	13	(0.3)	61	(1.4)
Dec	---	---	-7	(-0.2)	-12	(-0.3)	-21	(-0.5)	-11	(-0.3)	0	(0.0)	48	(1.1)
Average	---	---	11	(0.3)	9	(0.2)	-25	(-0.6)	9	(0.2)	18	(0.4)	44	(1.0)

Table 196. Monthly Surface Area Dry Year (2004) – Pueblo Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,341	3,207	3,169	3,121	2,781	3,168	3,206	3,370
Feb	3,431	3,305	3,260	3,211	2,853	3,259	3,299	3,460
Mar	3,509	3,395	3,363	3,317	2,941	3,361	3,388	3,554
Apr	3,468	3,372	3,341	3,295	2,923	3,339	3,362	3,537
May	3,342	3,272	3,249	3,202	2,845	3,244	3,261	3,444
Jun	3,141	3,058	3,035	2,986	2,697	3,029	3,033	3,234
Jul	3,078	3,008	2,972	2,918	2,656	2,966	2,961	3,174
Aug	3,106	3,055	3,010	2,949	2,686	3,004	3,000	3,220
Sep	3,063	3,025	2,973	2,915	2,660	2,967	2,964	3,188
Oct	3,041	2,996	2,945	2,893	2,637	2,939	2,938	3,155
Nov	3,070	3,025	2,974	2,918	2,658	2,971	2,984	3,199
Dec	3,204	3,152	3,096	3,038	2,752	3,094	3,106	3,327
Average	3,233	3,156	3,116	3,064	2,757	3,112	3,125	3,322
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-38 (-1.2)	-86 (-2.7)	-427 (-13.3)	-39 (-1.2)	-2 (-0.1)	163 (5.1)
Feb	---	---	-45 (-1.4)	-94 (-2.8)	-452 (-13.7)	-46 (-1.4)	-7 (-0.2)	155 (4.7)
Mar	---	---	-32 (-1.0)	-78 (-2.3)	-454 (-13.4)	-34 (-1.0)	-7 (-0.2)	158 (4.7)
Apr	---	---	-31 (-0.9)	-77 (-2.3)	-448 (-13.3)	-33 (-1.0)	-9 (-0.3)	165 (4.9)
May	---	---	-23 (-0.7)	-70 (-2.1)	-427 (-13.0)	-27 (-0.8)	-11 (-0.3)	172 (5.3)
Jun	---	---	-23 (-0.8)	-73 (-2.4)	-361 (-11.8)	-29 (-0.9)	-25 (-0.8)	176 (5.8)
Jul	---	---	-36 (-1.2)	-90 (-3.0)	-353 (-11.7)	-42 (-1.4)	-47 (-1.6)	166 (5.5)
Aug	---	---	-45 (-1.5)	-106 (-3.5)	-369 (-12.1)	-51 (-1.7)	-55 (-1.8)	165 (5.4)
Sep	---	---	-53 (-1.7)	-110 (-3.6)	-365 (-12.1)	-58 (-1.9)	-61 (-2.0)	163 (5.4)
Oct	---	---	-51 (-1.7)	-103 (-3.4)	-359 (-12.0)	-57 (-1.9)	-58 (-1.9)	159 (5.3)
Nov	---	---	-51 (-1.7)	-107 (-3.5)	-367 (-12.1)	-54 (-1.8)	-41 (-1.4)	174 (5.8)
Dec	---	---	-56 (-1.8)	-114 (-3.6)	-400 (-12.7)	-58 (-1.8)	-46 (-1.5)	175 (5.6)
Average	---	---	-40 (-1.3)	-92 (-2.9)	-399 (-12.6)	-44 (-1.4)	-31 (-1.0)	166 (5.3)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-134 (-4.0)	-172 (-5.2)	-221 (-6.6)	-561 (-16.8)	-173 (-5.2)	-136 (-4.1)	29 (0.9)
Feb	---	-125 (-3.7)	-171 (-5.0)	-219 (-6.4)	-578 (-16.8)	-172 (-5.0)	-132 (-3.9)	29 (0.9)
Mar	---	-114 (-3.3)	-147 (-4.2)	-192 (-5.5)	-569 (-16.2)	-148 (-4.2)	-121 (-3.5)	44 (1.3)
Apr	---	-96 (-2.8)	-126 (-3.6)	-172 (-5.0)	-544 (-15.7)	-129 (-3.7)	-105 (-3.0)	69 (2.0)
May	---	-71 (-2.1)	-93 (-2.8)	-141 (-4.2)	-498 (-14.9)	-98 (-2.9)	-81 (-2.4)	101 (3.0)
Jun	---	-83 (-2.6)	-106 (-3.4)	-156 (-5.0)	-444 (-14.1)	-112 (-3.6)	-108 (-3.4)	93 (3.0)
Jul	---	-70 (-2.3)	-106 (-3.4)	-160 (-5.2)	-422 (-13.7)	-112 (-3.6)	-117 (-3.8)	97 (3.1)
Aug	---	-51 (-1.7)	-97 (-3.1)	-157 (-5.1)	-420 (-13.5)	-103 (-3.3)	-107 (-3.4)	114 (3.7)
Sep	---	-37 (-1.2)	-90 (-2.9)	-148 (-4.8)	-403 (-13.1)	-96 (-3.1)	-98 (-3.2)	125 (4.1)
Oct	---	-45 (-1.5)	-96 (-3.2)	-147 (-4.8)	-404 (-13.3)	-102 (-3.4)	-103 (-3.4)	114 (3.7)
Nov	---	-45 (-1.5)	-96 (-3.1)	-153 (-5.0)	-413 (-13.4)	-99 (-3.2)	-87 (-2.8)	129 (4.2)
Dec	---	-52 (-1.6)	-107 (-3.3)	-166 (-5.2)	-452 (-14.1)	-110 (-3.4)	-98 (-3.1)	124 (3.9)
Average	---	-77 (-2.4)	-117 (-3.6)	-169 (-5.2)	-476 (-14.7)	-121 (-3.7)	-108 (-3.3)	89 (2.8)

Table 197. Monthly Surface Area Overall Average – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,063	3,406	3,392	3,358	3,256	3,387	3,399	3,518
Feb	4,218	3,553	3,534	3,502	3,406	3,530	3,543	3,658
Mar	4,321	3,637	3,616	3,587	3,493	3,613	3,629	3,747
Apr	4,216	3,612	3,586	3,557	3,470	3,584	3,604	3,714
May	4,063	3,538	3,516	3,485	3,391	3,514	3,534	3,642
Jun	4,020	3,510	3,495	3,463	3,359	3,492	3,502	3,622
Jul	3,932	3,386	3,377	3,345	3,242	3,374	3,379	3,511
Aug	3,768	3,173	3,163	3,133	3,031	3,161	3,169	3,301
Sep	3,669	3,020	3,006	2,967	2,860	3,003	3,014	3,155
Oct	3,631	2,940	2,928	2,890	2,773	2,924	2,935	3,081
Nov	3,679	3,008	2,999	2,961	2,840	2,995	3,005	3,148
Dec	3,868	3,198	3,191	3,155	3,042	3,187	3,197	3,328
Average	3,954	3,332	3,317	3,284	3,180	3,314	3,326	3,452
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-14 (-0.4)	-47 (-1.4)	-150 (-4.4)	-18 (-0.5)	-7 (-0.2)	112 (3.3)
Feb	---	---	-19 (-0.5)	-51 (-1.4)	-147 (-4.1)	-23 (-0.6)	-10 (-0.3)	105 (3.0)
Mar	---	---	-21 (-0.6)	-50 (-1.4)	-144 (-4.0)	-24 (-0.7)	-8 (-0.2)	110 (3.0)
Apr	---	---	-25 (-0.7)	-54 (-1.5)	-141 (-3.9)	-28 (-0.8)	-8 (-0.2)	102 (2.8)
May	---	---	-22 (-0.6)	-53 (-1.5)	-147 (-4.2)	-24 (-0.7)	-4 (-0.1)	104 (3.0)
Jun	---	---	-15 (-0.4)	-47 (-1.3)	-152 (-4.3)	-18 (-0.5)	-8 (-0.2)	112 (3.2)
Jul	---	---	-8 (-0.2)	-41 (-1.2)	-144 (-4.2)	-12 (-0.4)	-7 (-0.2)	125 (3.7)
Aug	---	---	-9 (-0.3)	-40 (-1.3)	-142 (-4.5)	-12 (-0.4)	-4 (-0.1)	129 (4.1)
Sep	---	---	-13 (-0.4)	-52 (-1.7)	-160 (-5.3)	-17 (-0.5)	-6 (-0.2)	136 (4.5)
Oct	---	---	-13 (-0.4)	-51 (-1.7)	-167 (-5.7)	-17 (-0.6)	-6 (-0.2)	140 (4.8)
Nov	---	---	-8 (-0.3)	-47 (-1.6)	-168 (-5.6)	-13 (-0.4)	-3 (-0.1)	140 (4.7)
Dec	---	---	-7 (-0.2)	-44 (-1.4)	-156 (-4.9)	-11 (-0.4)	-2 (-0.1)	129 (4.0)
Average	---	---	-15 (-0.4)	-48 (-1.4)	-151 (-4.5)	-18 (-0.5)	-6 (-0.2)	120 (3.6)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-658 (-16.2)	-672 (-16.5)	-705 (-17.4)	-808 (-19.9)	-676 (-16.6)	-665 (-16.4)	-546 (-13.4)
Feb	---	-665 (-15.8)	-684 (-16.2)	-717 (-17.0)	-813 (-19.3)	-688 (-16.3)	-675 (-16.0)	-560 (-13.3)
Mar	---	-684 (-15.8)	-705 (-16.3)	-735 (-17.0)	-828 (-19.2)	-708 (-16.4)	-692 (-16.0)	-574 (-13.3)
Apr	---	-604 (-14.3)	-630 (-14.9)	-659 (-15.6)	-746 (-17.7)	-632 (-15.0)	-612 (-14.5)	-502 (-11.9)
May	---	-525 (-12.9)	-547 (-13.5)	-578 (-14.2)	-672 (-16.5)	-549 (-13.5)	-529 (-13.0)	-421 (-10.4)
Jun	---	-510 (-12.7)	-525 (-13.1)	-557 (-13.9)	-661 (-16.4)	-528 (-13.1)	-518 (-12.9)	-398 (-9.9)
Jul	---	-546 (-13.9)	-555 (-14.1)	-587 (-14.9)	-690 (-17.5)	-558 (-14.2)	-553 (-14.1)	-421 (-10.7)
Aug	---	-595 (-15.8)	-604 (-16.0)	-635 (-16.9)	-737 (-19.6)	-607 (-16.1)	-599 (-15.9)	-466 (-12.4)
Sep	---	-650 (-17.7)	-663 (-18.1)	-702 (-19.1)	-810 (-22.1)	-667 (-18.2)	-656 (-17.9)	-514 (-14.0)
Oct	---	-690 (-19.0)	-703 (-19.4)	-741 (-20.4)	-857 (-23.6)	-707 (-19.5)	-696 (-19.2)	-550 (-15.2)
Nov	---	-671 (-18.2)	-679 (-18.5)	-718 (-19.5)	-839 (-22.8)	-683 (-18.6)	-673 (-18.3)	-530 (-14.4)
Dec	---	-669 (-17.3)	-677 (-17.5)	-713 (-18.4)	-825 (-21.3)	-681 (-17.6)	-671 (-17.3)	-540 (-14.0)
Average	---	-622 (-15.7)	-637 (-16.1)	-670 (-17.0)	-774 (-19.6)	-640 (-16.2)	-628 (-15.9)	-502 (-12.7)

Table 198. Monthly Surface Area Normal Year (2005) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,336	2,751	2,720	2,669	2,604	2,711	2,744	2,870
Feb	3,512	2,856	2,817	2,765	2,714	2,807	2,846	2,990
Mar	3,675	2,984	2,930	2,876	2,823	2,920	2,972	3,133
Apr	3,664	2,981	2,919	2,873	2,819	2,916	2,970	3,125
May	3,563	2,924	2,868	2,823	2,769	2,865	2,909	3,065
Jun	3,521	3,103	3,038	2,984	2,908	3,035	3,075	3,256
Jul	3,364	2,994	2,934	2,887	2,824	2,933	2,968	3,140
Aug	3,118	2,739	2,655	2,609	2,533	2,652	2,703	2,841
Sep	2,961	2,544	2,390	2,329	2,232	2,387	2,474	2,657
Oct	2,911	2,440	2,264	2,199	2,093	2,261	2,361	2,568
Nov	2,947	2,516	2,340	2,278	2,179	2,338	2,439	2,630
Dec	3,138	2,722	2,595	2,547	2,465	2,594	2,667	2,805
Average	3,309	2,796	2,706	2,653	2,580	2,702	2,761	2,923
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-30 (-1.1)	-82 (-3.0)	-146 (-5.3)	-40 (-1.4)	-7 (-0.2)	119 (4.3)
Feb	---	---	-39 (-1.4)	-91 (-3.2)	-142 (-5.0)	-49 (-1.7)	-10 (-0.3)	134 (4.7)
Mar	---	---	-53 (-1.8)	-107 (-3.6)	-160 (-5.4)	-63 (-2.1)	-11 (-0.4)	149 (5.0)
Apr	---	---	-62 (-2.1)	-108 (-3.6)	-162 (-5.4)	-66 (-2.2)	-11 (-0.4)	144 (4.8)
May	---	---	-55 (-1.9)	-101 (-3.4)	-155 (-5.3)	-59 (-2.0)	-15 (-0.5)	141 (4.8)
Jun	---	---	-65 (-2.1)	-119 (-3.8)	-195 (-6.3)	-69 (-2.2)	-28 (-0.9)	153 (4.9)
Jul	---	---	-60 (-2.0)	-107 (-3.6)	-170 (-5.7)	-61 (-2.0)	-25 (-0.8)	146 (4.9)
Aug	---	---	-84 (-3.1)	-131 (-4.8)	-206 (-7.5)	-87 (-3.2)	-36 (-1.3)	102 (3.7)
Sep	---	---	-154 (-6.1)	-215 (-8.4)	-311 (-12.2)	-157 (-6.2)	-70 (-2.8)	114 (4.5)
Oct	---	---	-176 (-7.2)	-241 (-9.9)	-347 (-14.2)	-179 (-7.3)	-79 (-3.3)	129 (5.3)
Nov	---	---	-176 (-7.0)	-238 (-9.4)	-337 (-13.4)	-178 (-7.1)	-77 (-3.1)	114 (4.5)
Dec	---	---	-127 (-4.7)	-175 (-6.4)	-257 (-9.4)	-128 (-4.7)	-55 (-2.0)	83 (3.0)
Average	---	---	-90 (-3.2)	-143 (-5.1)	-216 (-7.7)	-94 (-3.4)	-35 (-1.3)	127 (4.6)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-585 (-17.5)	-616 (-18.5)	-667 (-20.0)	-732 (-21.9)	-625 (-18.7)	-592 (-17.7)	-466 (-14.0)
Feb	---	-656 (-18.7)	-695 (-19.8)	-747 (-21.3)	-799 (-22.7)	-705 (-20.1)	-666 (-19.0)	-523 (-14.9)
Mar	---	-692 (-18.8)	-745 (-20.3)	-799 (-21.7)	-852 (-23.2)	-755 (-20.5)	-703 (-19.1)	-542 (-14.8)
Apr	---	-683 (-18.6)	-744 (-20.3)	-791 (-21.6)	-845 (-23.1)	-748 (-20.4)	-694 (-18.9)	-539 (-14.7)
May	---	-639 (-17.9)	-694 (-19.5)	-740 (-20.8)	-794 (-22.3)	-698 (-19.6)	-654 (-18.4)	-498 (-14.0)
Jun	---	-418 (-11.9)	-483 (-13.7)	-537 (-15.3)	-613 (-17.4)	-486 (-13.8)	-446 (-12.7)	-265 (-7.5)
Jul	---	-371 (-11.0)	-431 (-12.8)	-477 (-14.2)	-540 (-16.1)	-431 (-12.8)	-396 (-11.8)	-225 (-6.7)
Aug	---	-379 (-12.2)	-463 (-14.9)	-510 (-16.3)	-585 (-18.8)	-466 (-14.9)	-415 (-13.3)	-277 (-8.9)
Sep	---	-417 (-14.1)	-571 (-19.3)	-632 (-21.3)	-728 (-24.6)	-574 (-19.4)	-487 (-16.5)	-304 (-10.3)
Oct	---	-472 (-16.2)	-648 (-22.2)	-712 (-24.5)	-818 (-28.1)	-650 (-22.3)	-551 (-18.9)	-343 (-11.8)
Nov	---	-431 (-14.6)	-607 (-20.6)	-669 (-22.7)	-768 (-26.1)	-608 (-20.6)	-508 (-17.2)	-317 (-10.7)
Dec	---	-416 (-13.3)	-543 (-17.3)	-591 (-18.8)	-673 (-21.4)	-544 (-17.3)	-471 (-15.0)	-333 (-10.6)
Average	---	-513 (-15.5)	-603 (-18.2)	-656 (-19.8)	-729 (-22.0)	-608 (-18.4)	-549 (-16.6)	-386 (-11.7)

Table 199. Monthly Surface Area Wet Year (1997) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,650	4,547	4,557	4,562	4,565	4,560	4,564	4,572
Feb	4,725	4,672	4,673	4,674	4,674	4,673	4,675	4,678
Mar	4,747	4,725	4,725	4,726	4,725	4,726	4,729	4,733
Apr	4,383	4,616	4,616	4,613	4,614	4,616	4,622	4,623
May	4,231	4,469	4,477	4,472	4,467	4,478	4,475	4,482
Jun	4,223	4,267	4,262	4,255	4,253	4,263	4,245	4,296
Jul	4,383	4,245	4,250	4,241	4,239	4,251	4,229	4,306
Aug	4,352	4,141	4,136	4,127	4,129	4,135	4,117	4,187
Sep	4,304	4,056	4,040	4,034	4,037	4,035	4,028	4,092
Oct	4,269	4,003	3,978	3,974	3,976	3,973	3,977	4,038
Nov	4,250	4,055	4,039	4,034	4,025	4,033	4,036	4,100
Dec	4,357	4,146	4,138	4,131	4,109	4,131	4,131	4,203
Average	4,406	4,328	4,324	4,320	4,318	4,323	4,319	4,359
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	10 (0.2)	15 (0.3)	18 (0.4)	13 (0.3)	17 (0.4)	25 (0.5)
Feb	---	---	1 (0.0)	2 (0.0)	1 (0.0)	1 (0.0)	3 (0.1)	6 (0.1)
Mar	---	---	1 (0.0)	1 (0.0)	1 (0.0)	1 (0.0)	4 (0.1)	9 (0.2)
Apr	---	---	1 (0.0)	-3 (-0.1)	-2 (0.0)	1 (0.0)	6 (0.1)	7 (0.2)
May	---	---	8 (0.2)	3 (0.1)	-2 (0.0)	9 (0.2)	6 (0.1)	13 (0.3)
Jun	---	---	-5 (-0.1)	-13 (-0.3)	-14 (-0.3)	-4 (-0.1)	-22 (-0.5)	29 (0.7)
Jul	---	---	6 (0.1)	-3 (-0.1)	-6 (-0.1)	6 (0.1)	-15 (-0.4)	61 (1.4)
Aug	---	---	-5 (-0.1)	-14 (-0.3)	-12 (-0.3)	-6 (-0.1)	-24 (-0.6)	46 (1.1)
Sep	---	---	-16 (-0.4)	-22 (-0.5)	-18 (-0.5)	-21 (-0.5)	-27 (-0.7)	36 (0.9)
Oct	---	---	-25 (-0.6)	-29 (-0.7)	-27 (-0.7)	-30 (-0.8)	-26 (-0.6)	35 (0.9)
Nov	---	---	-16 (-0.4)	-21 (-0.5)	-29 (-0.7)	-22 (-0.5)	-19 (-0.5)	45 (1.1)
Dec	---	---	-7 (-0.2)	-15 (-0.4)	-37 (-0.9)	-15 (-0.4)	-15 (-0.3)	58 (1.4)
Average	---	---	-4 (-0.1)	-8 (-0.2)	-11 (-0.2)	-6 (-0.1)	-9 (-0.2)	31 (0.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-103 (-2.2)	-94 (-2.0)	-88 (-1.9)	-85 (-1.8)	-90 (-1.9)	-86 (-1.9)	-78 (-1.7)
Feb	---	-53 (-1.1)	-53 (-1.1)	-52 (-1.1)	-52 (-1.1)	-52 (-1.1)	-50 (-1.1)	-47 (-1.0)
Mar	---	-23 (-0.5)	-22 (-0.5)	-22 (-0.5)	-22 (-0.5)	-21 (-0.5)	-18 (-0.4)	-14 (-0.3)
Apr	---	233 (5.3)	234 (5.3)	230 (5.3)	231 (5.3)	234 (5.3)	239 (5.5)	240 (5.5)
May	---	238 (5.6)	246 (5.8)	241 (5.7)	236 (5.6)	247 (5.8)	244 (5.8)	251 (5.9)
Jun	---	44 (1.0)	39 (0.9)	31 (0.7)	29 (0.7)	39 (0.9)	22 (0.5)	73 (1.7)
Jul	---	-138 (-3.2)	-133 (-3.0)	-142 (-3.2)	-144 (-3.3)	-132 (-3.0)	-154 (-3.5)	-77 (-1.8)
Aug	---	-211 (-4.9)	-216 (-5.0)	-225 (-5.2)	-224 (-5.1)	-217 (-5.0)	-235 (-5.4)	-165 (-3.8)
Sep	---	-249 (-5.8)	-265 (-6.1)	-271 (-6.3)	-267 (-6.2)	-269 (-6.3)	-276 (-6.4)	-213 (-4.9)
Oct	---	-266 (-6.2)	-291 (-6.8)	-296 (-6.9)	-293 (-6.9)	-296 (-6.9)	-292 (-6.8)	-231 (-5.4)
Nov	---	-196 (-4.6)	-212 (-5.0)	-217 (-5.1)	-225 (-5.3)	-217 (-5.1)	-215 (-5.0)	-150 (-3.5)
Dec	---	-211 (-4.8)	-218 (-5.0)	-226 (-5.2)	-248 (-5.7)	-226 (-5.2)	-225 (-5.2)	-153 (-3.5)
Average	---	-78 (-1.8)	-82 (-1.9)	-86 (-2.0)	-89 (-2.0)	-83 (-1.9)	-87 (-2.0)	-47 (-1.1)

Table 200. Monthly Surface Area Dry Year (2004) – Pueblo Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,341	2,563	2,549	2,462	2,396	2,539	2,578	2,709
Feb	3,431	2,638	2,621	2,541	2,484	2,613	2,646	2,759
Mar	3,509	2,727	2,713	2,656	2,614	2,707	2,730	2,846
Apr	3,468	2,714	2,694	2,634	2,594	2,686	2,710	2,822
May	3,342	2,693	2,667	2,601	2,556	2,660	2,694	2,802
Jun	3,141	2,674	2,659	2,590	2,526	2,649	2,678	2,792
Jul	3,078	2,649	2,632	2,553	2,479	2,616	2,650	2,766
Aug	3,106	2,657	2,625	2,549	2,475	2,611	2,658	2,770
Sep	3,063	2,579	2,531	2,448	2,369	2,515	2,578	2,712
Oct	3,041	2,529	2,479	2,394	2,310	2,463	2,523	2,678
Nov	3,070	2,548	2,512	2,429	2,332	2,497	2,550	2,697
Dec	3,204	2,669	2,638	2,569	2,484	2,627	2,666	2,787
Average	3,233	2,637	2,610	2,535	2,468	2,599	2,638	2,762
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-14 (-0.5)	-101 (-3.9)	-166 (-6.5)	-24 (-0.9)	15 (0.6)	147 (5.7)
Feb	---	---	-17 (-0.6)	-98 (-3.7)	-154 (-5.8)	-25 (-1.0)	8 (0.3)	121 (4.6)
Mar	---	---	-13 (-0.5)	-71 (-2.6)	-112 (-4.1)	-20 (-0.7)	3 (0.1)	119 (4.4)
Apr	---	---	-20 (-0.7)	-80 (-3.0)	-120 (-4.4)	-27 (-1.0)	-4 (-0.1)	109 (4.0)
May	---	---	-26 (-1.0)	-92 (-3.4)	-137 (-5.1)	-33 (-1.2)	1 (0.0)	109 (4.1)
Jun	---	---	-15 (-0.6)	-84 (-3.1)	-148 (-5.5)	-26 (-1.0)	4 (0.1)	118 (4.4)
Jul	---	---	-17 (-0.6)	-96 (-3.6)	-170 (-6.4)	-33 (-1.2)	1 (0.0)	117 (4.4)
Aug	---	---	-32 (-1.2)	-108 (-4.1)	-182 (-6.9)	-46 (-1.7)	1 (0.0)	113 (4.2)
Sep	---	---	-48 (-1.9)	-131 (-5.1)	-210 (-8.1)	-64 (-2.5)	-1 (-0.1)	133 (5.2)
Oct	---	---	-50 (-2.0)	-135 (-5.4)	-220 (-8.7)	-66 (-2.6)	-6 (-0.2)	149 (5.9)
Nov	---	---	-36 (-1.4)	-118 (-4.6)	-216 (-8.5)	-51 (-2.0)	3 (0.1)	149 (5.9)
Dec	---	---	-31 (-1.2)	-100 (-3.8)	-185 (-6.9)	-42 (-1.6)	-4 (-0.1)	118 (4.4)
Average	---	---	-27 (-1.0)	-101 (-3.8)	-168 (-6.4)	-38 (-1.4)	2 (0.1)	125 (4.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-779 (-23.3)	-793 (-23.7)	-880 (-26.3)	-945 (-28.3)	-802 (-24.0)	-764 (-22.8)	-632 (-18.9)
Feb	---	-793 (-23.1)	-810 (-23.6)	-890 (-25.9)	-947 (-27.6)	-818 (-23.8)	-785 (-22.9)	-671 (-19.6)
Mar	---	-783 (-22.3)	-796 (-22.7)	-854 (-24.3)	-895 (-25.5)	-803 (-22.9)	-780 (-22.2)	-664 (-18.9)
Apr	---	-754 (-21.7)	-774 (-22.3)	-834 (-24.1)	-874 (-25.2)	-781 (-22.5)	-758 (-21.9)	-646 (-18.6)
May	---	-649 (-19.4)	-675 (-20.2)	-741 (-22.2)	-786 (-23.5)	-682 (-20.4)	-648 (-19.4)	-540 (-16.2)
Jun	---	-467 (-14.9)	-482 (-15.3)	-551 (-17.5)	-616 (-19.6)	-493 (-15.7)	-463 (-14.8)	-349 (-11.1)
Jul	---	-429 (-13.9)	-446 (-14.5)	-525 (-17.1)	-599 (-19.5)	-462 (-15.0)	-428 (-13.9)	-312 (-10.1)
Aug	---	-449 (-14.5)	-482 (-15.5)	-558 (-18.0)	-631 (-20.3)	-495 (-15.9)	-448 (-14.4)	-337 (-10.8)
Sep	---	-484 (-15.8)	-532 (-17.4)	-614 (-20.1)	-693 (-22.6)	-548 (-17.9)	-485 (-15.8)	-351 (-11.4)
Oct	---	-512 (-16.8)	-561 (-18.5)	-647 (-21.3)	-731 (-24.0)	-577 (-19.0)	-517 (-17.0)	-363 (-11.9)
Nov	---	-523 (-17.0)	-559 (-18.2)	-641 (-20.9)	-739 (-24.1)	-574 (-18.7)	-520 (-16.9)	-374 (-12.2)
Dec	---	-535 (-16.7)	-566 (-17.7)	-635 (-19.8)	-719 (-22.4)	-577 (-18.0)	-538 (-16.8)	-417 (-13.0)
Average	---	-596 (-18.4)	-623 (-19.3)	-697 (-21.6)	-765 (-23.7)	-634 (-19.6)	-595 (-18.4)	-471 (-14.6)

Colorado Canal System

The Colorado Canal system diverts native water rights and other water sources from the Arkansas River via Colorado Canal for direct delivery to agricultural water users or storage by agricultural and/or municipal water users in Lake Henry and Lake Meredith. Because of the junior status of Colorado Canal system water rights, native water rights diversions typically occur during high flow periods when adequate exchange potential exists to make exchanges. The Colorado Canal system also makes diversions and stores water during the winter water storage season.

Although Lake Henry and Lake Meredith are separate storage facilities, their operations are intertwined. The Daily Model typically makes reservoir releases (for agricultural deliveries and/or exchange) from Lake Henry before making releases from Lake Meredith. Although historical operations have varied, this is consistent with typical operations. Because of their connected operations, the specific reasons for differences in storage contents among alternatives apply to both reservoirs, and are discussed in the Lake Meredith section.

Lake Meredith

Monthly direct effects analysis storage contents for Lake Meredith are presented in Table 201 through Table 204. Many of the same differences among alternatives at Lake Meredith also apply to differences in storage contents for Lake Henry. There is very little difference between alternatives. Overall, Colorado Canal operations effects are negligible to minor. During a few winter months, effects are minor. During the typical wet year of 1997, there are minor decreases in storage for Master Contract entities during the early spring months as increased exchange potential causes releases from Colorado Canal for exchange into Pueblo Reservoir. Monthly cumulative effects analysis storage contents for Lake Meredith are presented in Table 205 through Table 208. Overall, storage for the cumulative effects analysis would be lower than it is for the direct effects. Differences between alternatives would be comparable. For Cumulative Effects, the typical wet year of 1997 shows minor increases in storage for Master Contract entities from January to May and October to December. This is due to increased diversions into Colorado Canal of water that cannot be stored in Pueblo Reservoir because of space limitations. The increased diversions into Colorado Canal during January and February of the dry year of 2004 discussed in the Rocky Ford gage section produce minor increases in storage.

Table 201. Monthly Storage Contents Overall Average – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	33,900	34,300	33,700	33,800	34,900	33,700	33,700	33,700
Feb	36,700	37,100	36,700	36,800	37,700	36,700	36,600	36,600
Mar	39,000	39,400	39,200	39,300	39,600	39,100	39,100	39,100
Apr	37,200	37,400	37,200	37,400	37,600	37,200	37,200	37,200
May	35,500	35,800	35,500	35,700	36,000	35,500	35,500	35,500
Jun	36,700	36,900	36,600	36,700	37,100	36,500	36,600	36,500
Jul	36,200	36,400	36,000	36,100	36,600	35,900	36,100	36,000
Aug	34,500	34,500	34,300	34,400	34,700	34,200	34,300	34,300
Sep	32,900	32,900	32,700	32,800	33,300	32,600	32,700	32,700
Oct	31,500	31,700	31,200	31,300	32,200	31,100	31,200	31,200
Nov	31,200	31,800	30,900	31,000	32,400	30,800	30,900	30,900
Dec	32,400	32,900	32,100	32,200	33,400	32,000	32,100	32,100
Average	34,800	35,100	34,700	34,800	35,400	34,600	34,700	34,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-600 (-1.7)	-500 (-1.5)	600 (1.7)	-600 (-1.7)	-600 (-1.7)	-600 (-1.7)
Feb	---	---	-400 (-1.1)	-300 (-0.8)	600 (1.6)	-400 (-1.1)	-500 (-1.3)	-500 (-1.3)
Mar	---	---	-200 (-0.5)	-100 (-0.3)	200 (0.5)	-300 (-0.8)	-300 (-0.8)	-300 (-0.8)
Apr	---	---	-200 (-0.5)	0 (0.0)	200 (0.5)	-200 (-0.5)	-200 (-0.5)	-200 (-0.5)
May	---	---	-300 (-0.8)	-100 (-0.3)	200 (0.6)	-300 (-0.8)	-300 (-0.8)	-300 (-0.8)
Jun	---	---	-300 (-0.8)	-200 (-0.5)	200 (0.5)	-400 (-1.1)	-300 (-0.8)	-400 (-1.1)
Jul	---	---	-400 (-1.1)	-300 (-0.8)	200 (0.5)	-500 (-1.4)	-300 (-0.8)	-400 (-1.1)
Aug	---	---	-200 (-0.6)	-100 (-0.3)	200 (0.6)	-300 (-0.9)	-200 (-0.6)	-200 (-0.6)
Sep	---	---	-200 (-0.6)	-100 (-0.3)	400 (1.2)	-300 (-0.9)	-200 (-0.6)	-200 (-0.6)
Oct	---	---	-500 (-1.6)	-400 (-1.3)	500 (1.6)	-600 (-1.9)	-500 (-1.6)	-500 (-1.6)
Nov	---	---	-900 (-2.8)	-800 (-2.5)	600 (1.9)	-1,000 (-3.1)	-900 (-2.8)	-900 (-2.8)
Dec	---	---	-800 (-2.4)	-700 (-2.1)	500 (1.5)	-900 (-2.7)	-800 (-2.4)	-800 (-2.4)
Average	---	---	-400 (-1.1)	-300 (-0.9)	300 (0.9)	-500 (-1.4)	-400 (-1.1)	-500 (-1.4)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	400 (1.2)	-200 (-0.6)	-100 (-0.3)	1,000 (2.9)	-200 (-0.6)	-200 (-0.6)	-200 (-0.6)
Feb	---	400 (1.1)	0 (0.0)	100 (0.3)	1,000 (2.7)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Mar	---	400 (1.0)	200 (0.5)	300 (0.8)	600 (1.5)	100 (0.3)	100 (0.3)	100 (0.3)
Apr	---	200 (0.5)	0 (0.0)	200 (0.5)	400 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	300 (0.8)	0 (0.0)	200 (0.6)	500 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	200 (0.5)	-100 (-0.3)	0 (0.0)	400 (1.1)	-200 (-0.5)	-100 (-0.3)	-200 (-0.5)
Jul	---	200 (0.6)	-200 (-0.6)	-100 (-0.3)	400 (1.1)	-300 (-0.8)	-100 (-0.3)	-200 (-0.6)
Aug	---	0 (0.0)	-200 (-0.6)	-100 (-0.3)	200 (0.6)	-300 (-0.9)	-200 (-0.6)	-200 (-0.6)
Sep	---	0 (0.0)	-200 (-0.6)	-100 (-0.3)	400 (1.2)	-300 (-0.9)	-200 (-0.6)	-200 (-0.6)
Oct	---	200 (0.6)	-300 (-1.0)	-200 (-0.6)	700 (2.2)	-400 (-1.3)	-300 (-1.0)	-300 (-1.0)
Nov	---	600 (1.9)	-300 (-1.0)	-200 (-0.6)	1,200 (3.8)	-400 (-1.3)	-300 (-1.0)	-300 (-1.0)
Dec	---	500 (1.5)	-300 (-0.9)	-200 (-0.6)	1,000 (3.1)	-400 (-1.2)	-300 (-0.9)	-300 (-0.9)
Average	---	300 (0.9)	-100 (-0.3)	0 (0.0)	600 (1.7)	-200 (-0.6)	-100 (-0.3)	-200 (-0.6)

Table 202. Monthly Storage Contents Normal Year (2005) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	37,100	35,400	34,400	35,000	35,200	34,500	35,600	34,900
Feb	41,100	41,100	41,100	41,100	41,100	41,100	41,100	41,100
Mar	41,300	41,400	41,500	41,500	41,500	41,500	41,500	41,500
Apr	36,100	36,800	37,600	37,600	37,000	37,600	37,400	37,300
May	33,000	33,800	34,500	34,500	34,200	34,500	34,400	34,000
Jun	40,500	40,600	40,700	40,700	40,600	40,700	40,600	40,600
Jul	40,900	40,900	40,900	40,900	41,000	40,900	40,900	40,900
Aug	39,400	39,400	39,500	39,400	39,400	39,400	39,400	39,400
Sep	39,400	39,400	39,400	39,400	39,400	39,300	39,400	39,400
Oct	36,800	36,800	36,500	36,500	36,800	36,400	36,500	36,700
Nov	34,900	35,000	34,600	34,500	35,200	34,500	34,500	34,800
Dec	33,700	33,800	33,400	33,300	33,900	33,300	33,300	33,600
Average	37,800	37,800	37,800	37,800	37,900	37,800	37,800	37,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-1,000 (-2.8)	-400 (-1.1)	-200 (-0.6)	-900 (-2.5)	200 (0.6)	-500 (-1.4)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)
Apr	---	---	800 (2.2)	800 (2.2)	200 (0.5)	800 (2.2)	600 (1.6)	500 (1.4)
May	---	---	700 (2.1)	700 (2.1)	400 (1.2)	700 (2.1)	600 (1.8)	200 (0.6)
Jun	---	---	100 (0.2)	100 (0.2)	0 (0.0)	100 (0.2)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	100 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-0.3)	0 (0.0)	0 (0.0)
Oct	---	---	-300 (-0.8)	-300 (-0.8)	0 (0.0)	-400 (-1.1)	-300 (-0.8)	-100 (-0.3)
Nov	---	---	-400 (-1.1)	-500 (-1.4)	200 (0.6)	-500 (-1.4)	-500 (-1.4)	-200 (-0.6)
Dec	---	---	-400 (-1.2)	-500 (-1.5)	100 (0.3)	-500 (-1.5)	-500 (-1.5)	-200 (-0.6)
Average	---	---	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-1,700 (-4.6)	-2,700 (-7.3)	-2,100 (-5.7)	-1,900 (-5.1)	-2,600 (-7.0)	-1,500 (-4.0)	-2,200 (-5.9)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	100 (0.2)	200 (0.5)	200 (0.5)	200 (0.5)	200 (0.5)	200 (0.5)	200 (0.5)
Apr	---	700 (1.9)	1,500 (4.2)	1,500 (4.2)	900 (2.5)	1,500 (4.2)	1,300 (3.6)	1,200 (3.3)
May	---	800 (2.4)	1,500 (4.5)	1,500 (4.5)	1,200 (3.6)	1,500 (4.5)	1,400 (4.2)	1,000 (3.0)
Jun	---	100 (0.2)	200 (0.5)	200 (0.5)	100 (0.2)	200 (0.5)	100 (0.2)	100 (0.2)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-0.3)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	-300 (-0.8)	-300 (-0.8)	0 (0.0)	-400 (-1.1)	-300 (-0.8)	-100 (-0.3)
Nov	---	100 (0.3)	-300 (-0.9)	-400 (-1.1)	300 (0.9)	-400 (-1.1)	-400 (-1.1)	-100 (-0.3)
Dec	---	100 (0.3)	-300 (-0.9)	-400 (-1.2)	200 (0.6)	-400 (-1.2)	-400 (-1.2)	-100 (-0.3)
Average	---	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)

Table 203. Monthly Storage Contents Wet Year (1997) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	30,900	33,000	31,500	31,300	33,900	31,200	31,400	31,000
Feb	34,200	36,200	34,800	34,600	37,200	34,600	34,700	34,300
Mar	35,200	37,300	36,100	35,900	38,300	35,900	36,000	35,700
Apr	30,500	32,400	30,900	30,800	33,500	30,700	30,800	30,500
May	28,700	30,600	29,000	28,900	31,800	28,800	28,900	28,500
Jun	38,500	39,300	38,400	38,300	39,800	38,300	38,300	38,200
Jul	39,700	39,800	39,700	39,700	39,800	39,700	39,700	39,800
Aug	40,700	40,800	40,800	40,800	40,800	40,800	40,800	40,800
Sep	39,300	39,300	39,300	39,300	39,300	39,300	39,300	39,300
Oct	37,800	38,200	37,600	37,600	38,300	37,600	37,600	37,600
Nov	40,300	40,600	40,100	40,100	40,700	40,100	40,100	40,100
Dec	40,600	40,600	40,700	40,700	40,600	40,600	40,700	40,600
Average	36,400	37,400	36,600	36,500	37,800	36,500	36,500	36,400
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-1,500 (-4.5)	-1,700 (-5.2)	900 (2.7)	-1,800 (-5.5)	-1,600 (-4.8)	-2,000 (-6.1)
Feb	---	---	-1,400 (-3.9)	-1,600 (-4.4)	1,000 (2.8)	-1,600 (-4.4)	-1,500 (-4.1)	-1,900 (-5.2)
Mar	---	---	-1,200 (-3.2)	-1,400 (-3.8)	1,000 (2.7)	-1,400 (-3.8)	-1,300 (-3.5)	-1,600 (-4.3)
Apr	---	---	-1,500 (-4.6)	-1,600 (-4.9)	1,100 (3.4)	-1,700 (-5.2)	-1,600 (-4.9)	-1,900 (-5.9)
May	---	---	-1,600 (-5.2)	-1,700 (-5.6)	1,200 (3.9)	-1,800 (-5.9)	-1,700 (-5.6)	-2,100 (-6.9)
Jun	---	---	-900 (-2.3)	-1,000 (-2.5)	500 (1.3)	-1,000 (-2.5)	-1,000 (-2.5)	-1,100 (-2.8)
Jul	---	---	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	-600 (-1.6)	-600 (-1.6)	100 (0.3)	-600 (-1.6)	-600 (-1.6)	-600 (-1.6)
Nov	---	---	-500 (-1.2)	-500 (-1.2)	100 (0.2)	-500 (-1.2)	-500 (-1.2)	-500 (-1.2)
Dec	---	---	100 (0.2)	100 (0.2)	0 (0.0)	0 (0.0)	100 (0.2)	0 (0.0)
Average	---	---	-800 (-2.1)	-900 (-2.4)	400 (1.1)	-900 (-2.4)	-900 (-2.4)	-1,000 (-2.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	2,100 (6.8)	600 (1.9)	400 (1.3)	3,000 (9.7)	300 (1.0)	500 (1.6)	100 (0.3)
Feb	---	2,000 (5.8)	600 (1.8)	400 (1.2)	3,000 (8.8)	400 (1.2)	500 (1.5)	100 (0.3)
Mar	---	2,100 (6.0)	900 (2.6)	700 (2.0)	3,100 (8.8)	700 (2.0)	800 (2.3)	500 (1.4)
Apr	---	1,900 (6.2)	400 (1.3)	300 (1.0)	3,000 (9.8)	200 (0.7)	300 (1.0)	0 (0.0)
May	---	1,900 (6.6)	300 (1.0)	200 (0.7)	3,100 (10.8)	100 (0.3)	200 (0.7)	-200 (-0.7)
Jun	---	800 (2.1)	-100 (-0.3)	-200 (-0.5)	1,300 (3.4)	-200 (-0.5)	-200 (-0.5)	-300 (-0.8)
Jul	---	100 (0.3)	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	100 (0.3)
Aug	---	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)	100 (0.2)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	400 (1.1)	-200 (-0.5)	-200 (-0.5)	500 (1.3)	-200 (-0.5)	-200 (-0.5)	-200 (-0.5)
Nov	---	300 (0.7)	-200 (-0.5)	-200 (-0.5)	400 (1.0)	-200 (-0.5)	-200 (-0.5)	-200 (-0.5)
Dec	---	0 (0.0)	100 (0.2)	100 (0.2)	0 (0.0)	0 (0.0)	100 (0.2)	0 (0.0)
Average	---	1,000 (2.7)	200 (0.5)	100 (0.3)	1,400 (3.8)	100 (0.3)	100 (0.3)	0 (0.0)

Table 204. Monthly Storage Contents Dry Year (2004) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	25,400	25,200	25,400	25,700	26,100	25,300	24,600	25,000
Feb	34,800	34,600	34,900	35,200	35,500	34,700	34,000	34,400
Mar	40,400	40,600	41,000	41,000	41,000	40,900	40,300	40,600
Apr	33,700	34,200	34,200	34,400	34,500	34,200	34,000	34,200
May	31,500	31,300	31,100	31,300	31,800	31,000	30,900	31,100
Jun	26,600	25,600	25,300	25,800	25,600	25,300	26,000	25,500
Jul	24,700	22,300	22,000	22,600	21,800	22,100	23,300	22,200
Aug	22,000	19,500	19,200	19,800	19,000	19,200	20,400	19,300
Sep	20,800	18,300	18,100	18,700	18,000	18,200	19,200	18,100
Oct	19,300	16,900	16,200	16,800	16,500	16,300	17,400	16,600
Nov	19,100	16,800	15,800	16,400	16,500	15,900	17,100	16,300
Dec	26,300	24,100	23,000	23,600	23,800	23,000	24,300	23,500
Average	27,000	25,700	25,500	25,900	25,800	25,500	25,900	25,500
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	200 (0.8)	500 (2.0)	900 (3.6)	100 (0.4)	-600 (-2.4)	-200 (-0.8)
Feb	---	---	300 (0.9)	600 (1.7)	900 (2.6)	100 (0.3)	-600 (-1.7)	-200 (-0.6)
Mar	---	---	400 (1.0)	400 (1.0)	400 (1.0)	300 (0.7)	-300 (-0.7)	0 (0.0)
Apr	---	---	0 (0.0)	200 (0.6)	300 (0.9)	0 (0.0)	-200 (-0.6)	0 (0.0)
May	---	---	-200 (-0.6)	0 (0.0)	500 (1.6)	-300 (-1.0)	-400 (-1.3)	-200 (-0.6)
Jun	---	---	-300 (-1.2)	200 (0.8)	0 (0.0)	-300 (-1.2)	400 (1.6)	-100 (-0.4)
Jul	---	---	-300 (-1.3)	300 (1.3)	-500 (-2.2)	-200 (-0.9)	1,000 (4.5)	-100 (-0.4)
Aug	---	---	-300 (-1.5)	300 (1.5)	-500 (-2.6)	-300 (-1.5)	900 (4.6)	-200 (-1.0)
Sep	---	---	-200 (-1.1)	400 (2.2)	-300 (-1.6)	-100 (-0.5)	900 (4.9)	-200 (-1.1)
Oct	---	---	-700 (-4.1)	-100 (-0.6)	-400 (-2.4)	-600 (-3.6)	500 (3.0)	-300 (-1.8)
Nov	---	---	-1,000 (-6.0)	-400 (-2.4)	-300 (-1.8)	-900 (-5.4)	300 (1.8)	-500 (-3.0)
Dec	---	---	-1,100 (-4.6)	-500 (-2.1)	-300 (-1.2)	-1,100 (-4.6)	200 (0.8)	-600 (-2.5)
Average	---	---	-200 (-0.8)	200 (0.8)	100 (0.4)	-200 (-0.8)	200 (0.8)	-200 (-0.8)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-200 (-0.8)	0 (0.0)	300 (1.2)	700 (2.8)	-100 (-0.4)	-800 (-3.1)	-400 (-1.6)
Feb	---	-200 (-0.6)	100 (0.3)	400 (1.1)	700 (2.0)	-100 (-0.3)	-800 (-2.3)	-400 (-1.1)
Mar	---	200 (0.5)	600 (1.5)	600 (1.5)	600 (1.5)	500 (1.2)	-100 (-0.2)	200 (0.5)
Apr	---	500 (1.5)	500 (1.5)	700 (2.1)	800 (2.4)	500 (1.5)	300 (0.9)	500 (1.5)
May	---	-200 (-0.6)	-400 (-1.3)	-200 (-0.6)	300 (1.0)	-500 (-1.6)	-600 (-1.9)	-400 (-1.3)
Jun	---	-1,000 (-3.8)	-1,300 (-4.9)	-800 (-3.0)	-1,000 (-3.8)	-1,300 (-4.9)	-600 (-2.3)	-1,100 (-4.1)
Jul	---	-2,400 (-9.7)	-2,700 (-10.9)	-2,100 (-8.5)	-2,900 (-11.7)	-2,600 (-10.5)	-1,400 (-5.7)	-2,500 (-10.1)
Aug	---	-2,500 (-11.4)	-2,800 (-12.7)	-2,200 (-10.0)	-3,000 (-13.6)	-2,800 (-12.7)	-1,600 (-7.3)	-2,700 (-12.3)
Sep	---	-2,500 (-12.0)	-2,700 (-13.0)	-2,100 (-10.1)	-2,800 (-13.5)	-2,600 (-12.5)	-1,600 (-7.7)	-2,700 (-13.0)
Oct	---	-2,400 (-12.4)	-3,100 (-16.1)	-2,500 (-13.0)	-2,800 (-14.5)	-3,000 (-15.5)	-1,900 (-9.8)	-2,700 (-14.0)
Nov	---	-2,300 (-12.0)	-3,300 (-17.3)	-2,700 (-14.1)	-2,600 (-13.6)	-3,200 (-16.8)	-2,000 (-10.5)	-2,800 (-14.7)
Dec	---	-2,200 (-8.4)	-3,300 (-12.5)	-2,700 (-10.3)	-2,500 (-9.5)	-3,300 (-12.5)	-2,000 (-7.6)	-2,800 (-10.6)
Average	---	-1,300 (-4.8)	-1,500 (-5.6)	-1,100 (-4.1)	-1,200 (-4.4)	-1,500 (-5.6)	-1,100 (-4.1)	-1,500 (-5.6)

Table 205. Monthly Storage Contents Overall Average – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	33,900	28,700	28,700	28,600	29,300	28,600	28,000	28,200
Feb	36,700	33,400	33,400	33,300	33,800	33,200	32,900	33,000
Mar	39,000	36,200	36,200	36,200	36,600	36,200	35,900	35,800
Apr	37,200	34,000	34,200	34,100	34,300	34,100	33,700	33,700
May	35,500	30,900	31,300	31,300	31,400	31,200	30,800	30,700
Jun	36,700	29,100	29,200	29,200	29,900	29,200	28,800	28,600
Jul	36,200	28,800	28,600	28,600	29,500	28,600	28,300	28,200
Aug	34,500	26,700	26,600	26,500	27,300	26,600	26,300	26,100
Sep	32,900	24,500	24,500	24,500	25,100	24,500	24,300	24,100
Oct	31,500	22,700	22,600	22,500	23,300	22,500	22,400	22,300
Nov	31,200	21,800	21,600	21,500	22,300	21,500	21,200	21,300
Dec	32,400	24,700	24,600	24,400	25,200	24,400	24,000	24,200
Average	34,800	28,400	28,400	28,400	29,000	28,400	28,000	28,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	-100 (-0.3)	600 (2.1)	-100 (-0.3)	-700 (-2.4)	-500 (-1.7)
Feb	---	---	0 (0.0)	-100 (-0.3)	400 (1.2)	-200 (-0.6)	-500 (-1.5)	-400 (-1.2)
Mar	---	---	0 (0.0)	0 (0.0)	400 (1.1)	0 (0.0)	-300 (-0.8)	-400 (-1.1)
Apr	---	---	200 (0.6)	100 (0.3)	300 (0.9)	100 (0.3)	-300 (-0.9)	-300 (-0.9)
May	---	---	400 (1.3)	400 (1.3)	500 (1.6)	300 (1.0)	-100 (-0.3)	-200 (-0.6)
Jun	---	---	100 (0.3)	100 (0.3)	800 (2.7)	100 (0.3)	-300 (-1.0)	-500 (-1.7)
Jul	---	---	-200 (-0.7)	-200 (-0.7)	700 (2.4)	-200 (-0.7)	-500 (-1.7)	-600 (-2.1)
Aug	---	---	-100 (-0.4)	-200 (-0.7)	600 (2.2)	-100 (-0.4)	-400 (-1.5)	-600 (-2.2)
Sep	---	---	0 (0.0)	0 (0.0)	600 (2.4)	0 (0.0)	-200 (-0.8)	-400 (-1.6)
Oct	---	---	-100 (-0.4)	-200 (-0.9)	600 (2.6)	-200 (-0.9)	-300 (-1.3)	-400 (-1.8)
Nov	---	---	-200 (-0.9)	-300 (-1.4)	500 (2.3)	-300 (-1.4)	-600 (-2.8)	-500 (-2.3)
Dec	---	---	-100 (-0.4)	-300 (-1.2)	500 (2.0)	-300 (-1.2)	-700 (-2.8)	-500 (-2.0)
Average	---	---	0 (0.0)	0 (0.0)	600 (2.1)	0 (0.0)	-400 (-1.4)	-400 (-1.4)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-5,200 (-15.3)	-5,200(-15.3)	-5,300(-15.6)	-4,600(-13.6)	-5,300(-15.6)	-5,900(-17.4)	-5,700(-16.8)
Feb	---	-3,300 (-9.0)	-3,300 (-9.0)	-3,400 (-9.3)	-2,900 (-7.9)	-3,500 (-9.5)	-3,800(-10.4)	-3,700 -10.1)
Mar	---	-2,800 (-7.2)	-2,800 (-7.2)	-2,800 (-7.2)	-2,400 (-6.2)	-2,800 (-7.2)	-3,100 (-7.9)	-3,200 (-8.2)
Apr	---	-3,200 (-8.6)	-3,000 (-8.1)	-3,100 (-8.3)	-2,900 (-7.8)	-3,100 (-8.3)	-3,500 (-9.4)	-3,500 (-9.4)
May	---	-4,600 (-13.0)	-4,200(-11.8)	-4,200(-11.8)	-4,100(-11.5)	-4,300(-12.1)	-4,700(-13.2)	-4,800(-13.5)
Jun	---	-7,600 (-20.7)	-7,500 (-20.4)	-7,500 (-20.4)	-6,800 (-18.5)	-7,500 (-20.4)	-7,900 (-21.5)	-8,100 (-22.1)
Jul	---	-7,400 (-20.4)	-7,600 (-21.0)	-7,600 (-21.0)	-6,700 (-18.5)	-7,600 (-21.0)	-7,900 (-21.8)	-8,000 (-22.1)
Aug	---	-7,800 (-22.6)	-7,900 (-22.9)	-8,000 (-23.2)	-7,200 (-20.9)	-7,900 (-22.9)	-8,200 (-23.8)	-8,400 (-24.3)
Sep	---	-8,400 (-25.5)	-8,400 (-25.5)	-8,400 (-25.5)	-7,800 (-23.7)	-8,400 (-25.5)	-8,600 (-26.1)	-8,800 (-26.7)
Oct	---	-8,800 (-27.9)	-8,900 (-28.3)	-9,000 (-28.6)	-8,200 (-26.0)	-9,000 (-28.6)	-9,100 (-28.9)	-9,200 (-29.2)
Nov	---	-9,400 (-30.1)	-9,600 (-30.8)	-9,700 (-31.1)	-8,900 (-28.5)	-9,700 (-31.1)	-10,000 (-32.1)	-9,900 (-31.7)
Dec	---	-7,700 (-23.8)	-7,800 (-24.1)	-8,000 (-24.7)	-7,200 (-22.2)	-8,000 (-24.7)	-8,400 (-25.9)	-8,200 (-25.3)
Average	---	-6,400 (-18.4)	-6,400 (-18.4)	-6,400 (-18.4)	-5,800 (-16.7)	-6,400 (-18.4)	-6,800 (-19.5)	-6,800 (-19.5)

Table 206. Monthly Storage Contents Normal Year (2005) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Contents (ac-ft)															
Jan	37,100	27,600		27,800		27,800		27,800		27,900		27,800		27,800	
Feb	41,100	39,800		39,900		39,900		39,900		39,900		39,900		39,900	
Mar	41,300	41,100		41,200		41,200		41,200		41,200		41,100		41,100	
Apr	36,100	39,300		39,500		39,500		39,400		39,500		39,300		39,300	
May	33,000	37,500		37,900		37,900		37,800		38,000		37,400		37,500	
Jun	40,500	40,000		39,700		39,700		39,600		39,600		40,100		39,900	
Jul	40,900	40,700		40,200		40,200		40,200		40,100		40,600		40,600	
Aug	39,400	39,600		40,300		40,400		40,400		40,300		40,200		40,200	
Sep	39,400	39,300		39,300		39,300		39,400		39,300		39,300		39,300	
Oct	36,800	36,100		36,000		36,000		36,400		36,000		35,800		36,100	
Nov	34,900	32,700		32,900		33,000		33,200		32,900		32,500		32,800	
Dec	33,700	31,400		31,700		31,700		32,000		31,700		31,300		31,500	
Average	37,800	37,100		37,200		37,200		37,200		37,200		37,100		37,100	
Change in Contents Compared to No Action [ac-ft (%)]															
Jan	---	---		200	(0.7)	200	(0.7)	200	(0.7)	300	(1.1)	200	(0.7)	200	(0.7)
Feb	---	---		100	(0.3)	100	(0.3)	100	(0.3)	100	(0.3)	100	(0.3)	100	(0.3)
Mar	---	---		100	(0.2)	100	(0.2)	100	(0.2)	100	(0.2)	0	(0.0)	0	(0.0)
Apr	---	---		200	(0.5)	200	(0.5)	100	(0.3)	200	(0.5)	0	(0.0)	0	(0.0)
May	---	---		400	(1.1)	400	(1.1)	300	(0.8)	500	(1.3)	-100	(-0.3)	0	(0.0)
Jun	---	---		-300	(-0.8)	-300	(-0.8)	-400	(-1.0)	-400	(-1.0)	100	(0.3)	-100	(-0.3)
Jul	---	---		-500	(-1.2)	-500	(-1.2)	-500	(-1.2)	-600	(-1.5)	-100	(-0.2)	-100	(-0.2)
Aug	---	---		700	(1.8)	800	(2.0)	800	(2.0)	700	(1.8)	600	(1.5)	600	(1.5)
Sep	---	---		0	(0.0)	0	(0.0)	100	(0.3)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		-100	(-0.3)	-100	(-0.3)	300	(0.8)	-100	(-0.3)	-300	(-0.8)	0	(0.0)
Nov	---	---		200	(0.6)	300	(0.9)	500	(1.5)	200	(0.6)	-200	(-0.6)	100	(0.3)
Dec	---	---		300	(1.0)	300	(1.0)	600	(1.9)	300	(1.0)	-100	(-0.3)	100	(0.3)
Average	---	---		100	(0.3)	100	(0.3)	100	(0.3)	100	(0.3)	0	(0.0)	0	(0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]															
Jan	---	-9,500	(-25.6)	-9,300	(-25.1)	-9,300	(-25.1)	-9,300	(-25.1)	-9,200	(-24.8)	-9,300	(-25.1)	-9,300	(-25.1)
Feb	---	-1,300	(-3.2)	-1,200	(-2.9)	-1,200	(-2.9)	-1,200	(-2.9)	-1,200	(-2.9)	-1,200	(-2.9)	-1,200	(-2.9)
Mar	---	-200	(-0.5)	-100	(-0.2)	-100	(-0.2)	-100	(-0.2)	-100	(-0.2)	-200	(-0.5)	-200	(-0.5)
Apr	---	3,200	(8.9)	3,400	(9.4)	3,400	(9.4)	3,300	(9.1)	3,400	(9.4)	3,200	(8.9)	3,200	(8.9)
May	---	4,500	(13.6)	4,900	(14.8)	4,900	(14.8)	4,800	(14.5)	5,000	(15.2)	4,400	(13.3)	4,500	(13.6)
Jun	---	-500	(-1.2)	-800	(-2.0)	-800	(-2.0)	-900	(-2.2)	-900	(-2.2)	-400	(-1.0)	-600	(-1.5)
Jul	---	-200	(-0.5)	-700	(-1.7)	-700	(-1.7)	-700	(-1.7)	-800	(-2.0)	-300	(-0.7)	-300	(-0.7)
Aug	---	200	(0.5)	900	(2.3)	1,000	(2.5)	1,000	(2.5)	900	(2.3)	800	(2.0)	800	(2.0)
Sep	---	-100	(-0.3)	-100	(-0.3)	-100	(-0.3)	0	(0.0)	-100	(-0.3)	-100	(-0.3)	-100	(-0.3)
Oct	---	-700	(-1.9)	-800	(-2.2)	-800	(-2.2)	-400	(-1.1)	-800	(-2.2)	-1,000	(-2.7)	-700	(-1.9)
Nov	---	-2,200	(-6.3)	-2,000	(-5.7)	-1,900	(-5.4)	-1,700	(-4.9)	-2,000	(-5.7)	-2,400	(-6.9)	-2,100	(-6.0)
Dec	---	-2,300	(-6.8)	-2,000	(-5.9)	-2,000	(-5.9)	-1,700	(-5.0)	-2,000	(-5.9)	-2,400	(-7.1)	-2,200	(-6.5)
Average	---	-700	(-1.9)	-600	(-1.6)	-600	(-1.6)	-600	(-1.6)	-600	(-1.6)	-700	(-1.9)	-700	(-1.9)

Table 207. Monthly Storage Contents Wet Year (1997) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	30,900	31,500	32,800	32,100	30,700	31,900	32,100	34,200
Feb	34,200	36,000	37,300	36,600	35,200	36,500	36,600	38,400
Mar	35,200	37,900	39,400	38,700	37,200	38,700	38,700	39,500
Apr	30,500	31,800	33,100	32,500	31,100	32,400	32,500	33,200
May	28,700	28,300	29,600	29,000	27,700	28,900	29,000	29,800
Jun	38,500	36,900	37,300	36,900	36,500	36,900	36,900	37,800
Jul	39,700	39,700	39,600	39,700	39,700	39,600	39,600	39,800
Aug	40,700	40,500	40,500	40,500	40,600	40,500	40,500	40,500
Sep	39,300	38,800	38,900	38,700	38,800	38,800	38,700	38,700
Oct	37,800	34,500	35,400	35,200	35,100	35,400	34,300	34,500
Nov	40,300	31,200	32,300	32,200	32,000	32,400	31,000	31,100
Dec	40,600	34,100	35,300	35,200	35,000	35,300	34,000	34,100
Average	36,400	35,100	36,000	35,600	34,900	35,600	35,300	36,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,300 (4.1)	600 (1.9)	-800 (-2.5)	400 (1.3)	600 (1.9)	2,700 (8.6)
Feb	---	---	1,300 (3.6)	600 (1.7)	-800 (-2.2)	500 (1.4)	600 (1.7)	2,400 (6.7)
Mar	---	---	1,500 (4.0)	800 (2.1)	-700 (-1.8)	800 (2.1)	800 (2.1)	1,600 (4.2)
Apr	---	---	1,300 (4.1)	700 (2.2)	-700 (-2.2)	600 (1.9)	700 (2.2)	1,400 (4.4)
May	---	---	1,300 (4.6)	700 (2.5)	-600 (-2.1)	600 (2.1)	700 (2.5)	1,500 (5.3)
Jun	---	---	400 (1.1)	0 (0.0)	-400 (-1.1)	0 (0.0)	0 (0.0)	900 (2.4)
Jul	---	---	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	100 (0.3)
Aug	---	---	0 (0.0)	0 (0.0)	100 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	100 (0.3)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Oct	---	---	900 (2.6)	700 (2.0)	600 (1.7)	900 (2.6)	-200 (-0.6)	0 (0.0)
Nov	---	---	1,100 (3.5)	1,000 (3.2)	800 (2.6)	1,200 (3.8)	-200 (-0.6)	-100 (-0.3)
Dec	---	---	1,200 (3.5)	1,100 (3.2)	900 (2.6)	1,200 (3.5)	-100 (-0.3)	0 (0.0)
Average	---	---	900 (2.6)	500 (1.4)	-200 (-0.6)	500 (1.4)	200 (0.6)	900 (2.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	600 (1.9)	1,900 (6.1)	1,200 (3.9)	-200 (-0.6)	1,000 (3.2)	1,200 (3.9)	3,300 (10.7)
Feb	---	1,800 (5.3)	3,100 (9.1)	2,400 (7.0)	1,000 (2.9)	2,300 (6.7)	2,400 (7.0)	4,200 (12.3)
Mar	---	2,700 (7.7)	4,200 (11.9)	3,500 (9.9)	2,000 (5.7)	3,500 (9.9)	3,500 (9.9)	4,300 (12.2)
Apr	---	1,300 (4.3)	2,600 (8.5)	2,000 (6.6)	600 (2.0)	1,900 (6.2)	2,000 (6.6)	2,700 (8.9)
May	---	-400 (-1.4)	900 (3.1)	300 (1.0)	-1,000 (-3.5)	200 (0.7)	300 (1.0)	1,100 (3.8)
Jun	---	-1,600 (-4.2)	-1,200 (-3.1)	-1,600 (-4.2)	-2,000 (-5.2)	-1,600 (-4.2)	-1,600 (-4.2)	-700 (-1.8)
Jul	---	0 (0.0)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	100 (0.3)
Aug	---	-200 (-0.5)	-200 (-0.5)	-200 (-0.5)	-100 (-0.2)	-200 (-0.5)	-200 (-0.5)	-200 (-0.5)
Sep	---	-500 (-1.3)	-400 (-1.0)	-600 (-1.5)	-500 (-1.3)	-500 (-1.3)	-600 (-1.5)	-600 (-1.5)
Oct	---	-3,300 (-8.7)	-2,400 (-6.3)	-2,600 (-6.9)	-2,700 (-7.1)	-2,400 (-6.3)	-3,500 (-9.3)	-3,300 (-8.7)
Nov	---	-9,100 (-22.6)	-8,000 (-19.9)	-8,100 (-20.1)	-8,300 (-20.6)	-7,900 (-19.6)	-9,300 (-23.1)	-9,200 (-22.8)
Dec	---	-6,500 (-16.0)	-5,300 (-13.1)	-5,400 (-13.3)	-5,600 (-13.8)	-5,300 (-13.1)	-6,600 (-16.3)	-6,500 (-16.0)
Average	---	-1,300 (-3.6)	-400 (-1.1)	-800 (-2.2)	-1,500 (-4.1)	-800 (-2.2)	-1,100 (-3.0)	-400 (-1.1)

Table 208. Monthly Storage Contents Dry Year (2004) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	25,400	28,800	29,500	29,600	29,600	29,600	28,600	28,800
Feb	34,800	39,200	40,200	40,300	40,000	40,200	39,200	39,400
Mar	40,400	41,200	41,200	41,200	41,200	41,200	41,200	41,200
Apr	33,700	36,500	36,700	36,700	36,600	36,700	36,400	36,300
May	31,500	30,500	31,100	31,100	30,700	31,000	30,800	30,400
Jun	26,600	14,900	14,300	14,400	15,100	14,600	15,500	14,100
Jul	24,700	6,900	6,300	6,400	7,200	6,600	7,100	6,100
Aug	22,000	3,800	3,600	3,600	3,800	3,600	3,500	3,600
Sep	20,800	3,800	3,700	3,700	3,800	3,700	3,400	3,600
Oct	19,300	2,700	2,500	2,400	2,900	2,500	2,300	2,600
Nov	19,100	3,600	3,300	3,300	3,600	3,300	3,300	3,600
Dec	26,300	13,000	12,900	12,900	13,100	13,000	12,900	13,000
Average	27,000	18,600	18,600	18,700	18,800	18,700	18,600	18,400
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	700 (2.4)	800 (2.8)	800 (2.8)	800 (2.8)	-200 (-0.7)	0 (0.0)
Feb	---	---	1,000 (2.6)	1,100 (2.8)	800 (2.0)	1,000 (2.6)	0 (0.0)	200 (0.5)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	200 (0.5)	200 (0.5)	100 (0.3)	200 (0.5)	-100 (-0.3)	-200 (-0.5)
May	---	---	600 (2.0)	600 (2.0)	200 (0.7)	500 (1.6)	300 (1.0)	-100 (-0.3)
Jun	---	---	-600 (-4.0)	-500 (-3.4)	200 (1.3)	-300 (-2.0)	600 (4.0)	-800 (-5.4)
Jul	---	---	-600 (-8.7)	-500 (-7.2)	300 (4.3)	-300 (-4.3)	200 (2.9)	-800 (-11.6)
Aug	---	---	-200 (-5.3)	-200 (-5.3)	0 (0.0)	-200 (-5.3)	-300 (-7.9)	-200 (-5.3)
Sep	---	---	-100 (-2.6)	-100 (-2.6)	0 (0.0)	-100 (-2.6)	-400 (-10.5)	-200 (-5.3)
Oct	---	---	-200 (-7.4)	-300 (-11.1)	200 (7.4)	-200 (-7.4)	-400 (-14.8)	-100 (-3.7)
Nov	---	---	-300 (-8.3)	-300 (-8.3)	0 (0.0)	-300 (-8.3)	-300 (-8.3)	0 (0.0)
Dec	---	---	-100 (-0.8)	-100 (-0.8)	100 (0.8)	0 (0.0)	-100 (-0.8)	0 (0.0)
Average	---	---	0 (0.0)	100 (0.5)	200 (1.1)	100 (0.5)	0 (0.0)	-200 (-1.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	3,400 (13.4)	4,100 (16.1)	4,200 (16.5)	4,200 (16.5)	4,200 (16.5)	3,200 (12.6)	3,400 (13.4)
Feb	---	4,400 (12.6)	5,400 (15.5)	5,500 (15.8)	5,200 (14.9)	5,400 (15.5)	4,400 (12.6)	4,600 (13.2)
Mar	---	800 (2.0)	800 (2.0)	800 (2.0)	800 (2.0)	800 (2.0)	800 (2.0)	800 (2.0)
Apr	---	2,800 (8.3)	3,000 (8.9)	3,000 (8.9)	2,900 (8.6)	3,000 (8.9)	2,700 (8.0)	2,600 (7.7)
May	---	-1,000 (-3.2)	-400 (-1.3)	-400 (-1.3)	-800 (-2.5)	-500 (-1.6)	-700 (-2.2)	-1,100 (-3.5)
Jun	---	-11,700 (-44.0)	-12,300 (-46.2)	-12,200 (-45.9)	-11,500 (-43.2)	-12,000 (-45.1)	-11,100 (-41.7)	-12,500 (-47.0)
Jul	---	-17,800 (-72.1)	-18,400 (-74.5)	-18,300 (-74.1)	-17,500 (-70.9)	-18,100 (-73.3)	-17,600 (-71.3)	-18,600 (-75.3)
Aug	---	-18,200 (-82.7)	-18,400 (-83.6)	-18,400 (-83.6)	-18,200 (-82.7)	-18,400 (-83.6)	-18,500 (-84.1)	-18,400 (-83.6)
Sep	---	-17,000 (-81.7)	-17,100 (-82.2)	-17,100 (-82.2)	-17,000 (-81.7)	-17,100 (-82.2)	-17,400 (-83.7)	-17,200 (-82.7)
Oct	---	-16,600 (-86.0)	-16,800 (-87.0)	-16,900 (-87.6)	-16,400 (-85.0)	-16,800 (-87.0)	-17,000 (-88.1)	-16,700 (-86.5)
Nov	---	-15,500 (-81.2)	-15,800 (-82.7)	-15,800 (-82.7)	-15,500 (-81.2)	-15,800 (-82.7)	-15,800 (-82.7)	-15,500 (-81.2)
Dec	---	-13,300 (-50.6)	-13,400 (-51.0)	-13,400 (-51.0)	-13,200 (-50.2)	-13,300 (-50.6)	-13,400 (-51.0)	-13,300 (-50.6)
Average	---	-8,400 (-31.1)	-8,400 (-31.1)	-8,300 (-30.7)	-8,200 (-30.4)	-8,300 (-30.7)	-8,400 (-31.1)	-8,600 (-31.9)

Simulated water surface elevation for Lake Meredith is presented in Table 209 through Table 212 for the direct effects analysis, and Table 213 through Table 216 for the cumulative effects analysis. Simulated surface area for Lake Meredith is presented in Table 217 through Table 220 for the direct effects analysis, and Table 221 through Table 224 for the cumulative effects analysis.

Table 209. Monthly Water Surface Elevation Overall Average – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,253.0	4,253.1	4,253.0	4,253.0	4,253.2	4,253.0	4,253.0	4,253.0
Feb	4,253.6	4,253.7	4,253.6	4,253.6	4,253.8	4,253.6	4,253.6	4,253.6
Mar	4,254.0	4,254.1	4,254.0	4,254.1	4,254.1	4,254.0	4,254.0	4,254.0
Apr	4,253.7	4,253.7	4,253.7	4,253.7	4,253.8	4,253.7	4,253.7	4,253.7
May	4,253.4	4,253.4	4,253.4	4,253.4	4,253.5	4,253.4	4,253.4	4,253.4
Jun	4,253.6	4,253.6	4,253.5	4,253.6	4,253.6	4,253.5	4,253.5	4,253.5
Jul	4,253.5	4,253.5	4,253.4	4,253.4	4,253.5	4,253.4	4,253.4	4,253.4
Aug	4,253.1	4,253.1	4,253.1	4,253.1	4,253.2	4,253.1	4,253.1	4,253.1
Sep	4,252.8	4,252.8	4,252.8	4,252.8	4,252.9	4,252.8	4,252.8	4,252.8
Oct	4,252.5	4,252.6	4,252.5	4,252.5	4,252.7	4,252.5	4,252.5	4,252.5
Nov	4,252.5	4,252.6	4,252.4	4,252.4	4,252.7	4,252.4	4,252.4	4,252.4
Dec	4,252.7	4,252.8	4,252.7	4,252.7	4,252.9	4,252.6	4,252.7	4,252.7
Average	4,253.2	4,253.2	4,253.2	4,253.2	4,253.3	4,253.2	4,253.2	4,253.2
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.1 (0.9)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Feb	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.1 (0.9)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Mar	---	---	-0.1 (-0.8)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)
Jun	---	---	-0.1 (-0.9)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Jul	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.1 (-1.0)	-0.1 (-1.0)	0.1 (1.0)	-0.2 (-1.9)	-0.1 (-1.0)	-0.1 (-1.0)
Nov	---	---	-0.2 (-1.9)	-0.2 (-1.9)	0.1 (1.0)	-0.2 (-1.9)	-0.2 (-1.9)	-0.2 (-1.9)
Dec	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.1 (0.9)	-0.2 (-1.9)	-0.1 (-0.9)	-0.1 (-0.9)
Average	---	---	-0.1 (-0.7)	-0.1 (-0.5)	0.1 (0.7)	-0.1 (-0.8)	-0.1 (-0.7)	-0.1 (-0.8)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.2 (1.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.2 (1.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	0.1 (0.8)	0.0 (0.0)	0.1 (0.8)	0.1 (0.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Apr	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)
Jun	---	0.0 (0.0)	-0.1 (-0.9)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Jul	---	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	0.1 (1.0)	0.0 (0.0)	0.0 (0.0)	0.2 (1.9)	-0.1 (-1.0)	0.0 (0.0)	0.0 (0.0)
Nov	---	0.1 (1.0)	-0.1 (-1.0)	-0.1 (-1.0)	0.2 (1.9)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)
Dec	---	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.2 (1.9)	-0.1 (-0.9)	0.0 (0.0)	0.0 (0.0)
Average	---	0.1 (0.5)	0.0 (-0.2)	0.0 (-0.1)	0.1 (1.1)	0.0 (-0.4)	0.0 (-0.2)	0.0 (-0.3)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 210. Monthly Water Surface Elevation Normal Year (2005) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,253.7	4,253.4	4,253.2	4,253.3	4,253.3	4,253.2	4,253.4	4,253.3
Feb	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Mar	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4
Apr	4,253.5	4,253.7	4,253.8	4,253.8	4,253.7	4,253.8	4,253.8	4,253.8
May	4,252.9	4,253.1	4,253.2	4,253.2	4,253.2	4,253.2	4,253.2	4,253.1
Jun	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Jul	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Aug	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1
Sep	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1
Oct	4,253.7	4,253.7	4,253.6	4,253.6	4,253.7	4,253.6	4,253.6	4,253.6
Nov	4,253.3	4,253.3	4,253.3	4,253.2	4,253.4	4,253.2	4,253.2	4,253.3
Dec	4,253.1	4,253.1	4,253.0	4,253.0	4,253.1	4,253.0	4,253.0	4,253.1
Average	4,253.8	4,253.8	4,253.8	4,253.8	4,253.8	4,253.8	4,253.8	4,253.8
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.2 (-1.6)	-0.1 (-0.6)	0.0 (-0.4)	-0.2 (-1.5)	0.0 (0.3)	-0.1 (-0.8)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.0 (0.1)	0.0 (0.1)	0.0 (0.0)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)
Apr	---	---	0.2 (1.4)	0.2 (1.3)	0.0 (0.3)	0.2 (1.3)	0.1 (1.0)	0.1 (0.9)
May	---	---	0.1 (1.2)	0.1 (1.2)	0.1 (0.6)	0.1 (1.1)	0.1 (0.9)	0.0 (0.4)
Jun	---	---	0.0 (0.1)	0.0 (0.1)	0.0 (0.0)	0.0 (0.1)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.1)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.1 (-0.5)	-0.1 (-0.6)	0.0 (0.0)	-0.1 (-0.7)	-0.1 (-0.5)	0.0 (-0.2)
Nov	---	---	-0.1 (-0.7)	-0.1 (-0.8)	0.0 (0.2)	-0.1 (-0.9)	-0.1 (-0.8)	0.0 (-0.4)
Dec	---	---	-0.1 (-0.7)	-0.1 (-0.8)	0.0 (0.3)	-0.1 (-0.9)	-0.1 (-0.8)	0.0 (-0.4)
Average	---	---	0.0 (-0.1)	0.0 (0.0)	0.0 (0.1)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.3 (-2.8)	-0.5 (-4.3)	-0.4 (-3.4)	-0.4 (-3.1)	-0.5 (-4.2)	-0.3 (-2.5)	-0.4 (-3.6)
Feb	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	0.0 (0.1)	0.0 (0.2)	0.0 (0.2)	0.0 (0.1)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)
Apr	---	0.1 (1.1)	0.3 (2.5)	0.3 (2.4)	0.2 (1.4)	0.3 (2.4)	0.2 (2.0)	0.2 (1.9)
May	---	0.2 (1.5)	0.3 (2.7)	0.3 (2.7)	0.2 (2.1)	0.3 (2.6)	0.3 (2.4)	0.2 (1.9)
Jun	---	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)
Jul	---	0.0 (0.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (0.0)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.1)
Sep	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)
Oct	---	0.0 (0.1)	0.0 (-0.4)	-0.1 (-0.5)	0.0 (0.1)	-0.1 (-0.6)	0.0 (-0.4)	0.0 (-0.1)
Nov	---	0.0 (0.3)	-0.1 (-0.4)	-0.1 (-0.5)	0.1 (0.4)	-0.1 (-0.6)	-0.1 (-0.5)	0.0 (-0.1)
Dec	---	0.0 (0.2)	-0.1 (-0.5)	-0.1 (-0.6)	0.1 (0.5)	-0.1 (-0.7)	-0.1 (-0.6)	0.0 (-0.2)
Average	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.1)	0.0 (-0.1)	0.0 (0.0)	0.0 (0.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 211. Monthly Water Surface Elevation Wet Year (1997) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,252.5	4,252.9	4,252.6	4,252.6	4,253.1	4,252.6	4,252.6	4,252.5
Feb	4,253.2	4,253.5	4,253.3	4,253.2	4,253.7	4,253.2	4,253.3	4,253.2
Mar	4,253.4	4,253.7	4,253.5	4,253.5	4,253.9	4,253.5	4,253.5	4,253.4
Apr	4,252.5	4,252.8	4,252.5	4,252.5	4,253.0	4,252.5	4,252.5	4,252.5
May	4,252.1	4,252.5	4,252.2	4,252.1	4,252.7	4,252.1	4,252.1	4,252.1
Jun	4,253.9	4,254.1	4,253.9	4,253.9	4,254.1	4,253.9	4,253.9	4,253.8
Jul	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2
Aug	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Sep	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1
Oct	4,253.8	4,253.9	4,253.8	4,253.8	4,253.9	4,253.8	4,253.8	4,253.8
Nov	4,254.2	4,254.3	4,254.2	4,254.2	4,254.3	4,254.2	4,254.2	4,254.2
Dec	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Average	4,253.5	4,253.7	4,253.6	4,253.6	4,253.8	4,253.6	4,253.6	4,253.5
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.3 (-2.8)	-0.3 (-2.8)	0.2 (1.9)	-0.3 (-2.8)	-0.3 (-2.8)	-0.4 (-3.7)
Feb	---	---	-0.2 (-1.8)	-0.3 (-2.6)	0.2 (1.8)	-0.3 (-2.6)	-0.2 (-1.8)	-0.3 (-2.6)
Mar	---	---	-0.2 (-1.7)	-0.2 (-1.7)	0.2 (1.7)	-0.2 (-1.7)	-0.2 (-1.7)	-0.3 (-2.6)
Apr	---	---	-0.3 (-2.8)	-0.3 (-2.8)	0.2 (1.9)	-0.3 (-2.8)	-0.3 (-2.8)	-0.3 (-2.8)
May	---	---	-0.3 (-2.9)	-0.4 (-3.9)	0.2 (1.9)	-0.4 (-3.9)	-0.4 (-3.9)	-0.5 (-4.8)
Jun	---	---	-0.2 (-1.7)	-0.2 (-1.7)	0.0 (0.0)	-0.2 (-1.7)	-0.2 (-1.7)	-0.3 (-2.5)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.0 (0.0)	-0.1 (-0.9)	-0.1 (-0.9)	-0.1 (-0.9)
Nov	---	---	-0.1 (-0.8)	-0.1 (-0.8)	0.0 (0.0)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	-0.1 (-1.2)	-0.2 (-1.4)	0.1 (0.7)	-0.2 (-1.4)	-0.2 (-1.3)	-0.2 (-1.7)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.4 (3.9)	0.1 (1.0)	0.1 (1.0)	0.6 (5.8)	0.1 (1.0)	0.1 (1.0)	0.0 (0.0)
Feb	---	0.3 (2.7)	0.1 (0.9)	0.0 (0.0)	0.5 (4.5)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)
Mar	---	0.4 (3.6)	0.2 (1.8)	0.2 (1.8)	0.6 (5.4)	0.2 (1.8)	0.2 (1.8)	0.1 (0.9)
Apr	---	0.4 (3.9)	0.1 (1.0)	0.1 (1.0)	0.6 (5.9)	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)
May	---	0.4 (4.0)	0.1 (1.0)	0.0 (0.0)	0.6 (6.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.0)
Jun	---	0.2 (1.7)	0.0 (0.0)	0.0 (0.0)	0.2 (1.7)	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)
Jul	---	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Nov	---	0.1 (0.8)	0.0 (0.0)	0.0 (0.0)	0.1 (0.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Dec	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	0.2 (1.8)	0.1 (0.5)	0.0 (0.4)	0.3 (2.5)	0.0 (0.4)	0.0 (0.4)	0.0 (0.1)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 212. Monthly Water Surface Elevation Dry Year (2004) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	4,251.4	4,251.3		4,251.4		4,251.4		4,251.5		4,251.3		4,251.2		4,251.3	
Feb	4,253.3	4,253.2		4,253.3		4,253.3		4,253.4		4,253.3		4,253.1		4,253.2	
Mar	4,254.3	4,254.3		4,254.3		4,254.3		4,254.3		4,254.3		4,254.3		4,254.3	
Apr	4,253.1	4,253.2		4,253.2		4,253.2		4,253.2		4,253.2		4,253.1		4,253.2	
May	4,252.7	4,252.6		4,252.6		4,252.6		4,252.7		4,252.6		4,252.5		4,252.6	
Jun	4,251.6	4,251.4		4,251.3		4,251.4		4,251.4		4,251.3		4,251.5		4,251.4	
Jul	4,251.2	4,250.7		4,250.6		4,250.7		4,250.5		4,250.6		4,250.9		4,250.6	
Aug	4,250.6	4,250.0		4,249.9		4,250.1		4,249.9		4,249.9		4,250.2		4,249.9	
Sep	4,250.3	4,249.7		4,249.6		4,249.8		4,249.6		4,249.6		4,249.9		4,249.6	
Oct	4,249.9	4,249.3		4,249.1		4,249.3		4,249.2		4,249.1		4,249.4		4,249.2	
Nov	4,249.9	4,249.3		4,249.0		4,249.2		4,249.2		4,249.0		4,249.3		4,249.2	
Dec	4,251.6	4,251.1		4,250.8		4,251.0		4,251.0		4,250.8		4,251.1		4,250.9	
Average	4,251.6	4,251.3		4,251.3		4,251.4		4,251.3		4,251.3		4,251.4		4,251.3	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		0.1	(1.1)	0.1	(1.1)	0.2	(2.2)	0.0	(0.0)	-0.1	(-1.1)	0.0	(0.0)
Feb	---	---		0.1	(0.9)	0.1	(0.9)	0.2	(1.8)	0.1	(0.9)	-0.1	(-0.9)	0.0	(0.0)
Mar	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Apr	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.9)	0.0	(0.0)
May	---	---		0.0	(0.0)	0.0	(0.0)	0.1	(1.0)	0.0	(0.0)	-0.1	(-1.0)	0.0	(0.0)
Jun	---	---		-0.1	(-1.1)	0.0	(0.0)	0.0	(0.0)	-0.1	(-1.1)	0.1	(1.1)	0.0	(0.0)
Jul	---	---		0.0	(0.0)	0.1	(1.2)	-0.1	(-1.2)	0.0	(0.0)	0.3	(3.6)	0.0	(0.0)
Aug	---	---		-0.1	(-1.3)	0.1	(1.3)	-0.1	(-1.3)	-0.1	(-1.3)	0.2	(2.5)	-0.1	(-1.3)
Sep	---	---		-0.1	(-1.3)	0.1	(1.3)	-0.1	(-1.3)	-0.1	(-1.3)	0.2	(2.6)	-0.1	(-1.3)
Oct	---	---		-0.2	(-2.8)	0.0	(0.0)	-0.1	(-1.4)	-0.2	(-2.8)	0.1	(1.4)	-0.1	(-1.4)
Nov	---	---		-0.3	(-4.2)	-0.1	(-1.4)	-0.1	(-1.4)	-0.3	(-4.2)	0.0	(0.0)	-0.2	(-2.8)
Dec	---	---		-0.3	(-3.4)	-0.2	(-2.2)	-0.1	(-1.1)	-0.3	(-3.4)	0.0	(0.0)	-0.2	(-2.2)
Average	---	---		-0.1	(-0.8)	0.0	(0.2)	0.0	(-0.1)	-0.1	(-0.9)	0.0	(0.5)	-0.1	(-0.6)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-0.1	(-1.1)	0.0	(0.0)	0.0	(0.0)	0.1	(1.1)	-0.1	(-1.1)	-0.2	(-2.2)	-0.1	(-1.1)
Feb	---	-0.1	(-0.9)	0.0	(0.0)	0.0	(0.0)	0.1	(0.9)	0.0	(0.0)	-0.2	(-1.8)	-0.1	(-0.9)
Mar	---	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Apr	---	0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.0	(0.0)	0.1	(0.9)
May	---	-0.1	(-0.9)	-0.1	(-0.9)	-0.1	(-0.9)	0.0	(0.0)	-0.1	(-0.9)	-0.2	(-1.9)	-0.1	(-0.9)
Jun	---	-0.2	(-2.1)	-0.3	(-3.2)	-0.2	(-2.1)	-0.2	(-2.1)	-0.3	(-3.2)	-0.1	(-1.1)	-0.2	(-2.1)
Jul	---	-0.6	(-6.6)	-0.6	(-6.6)	-0.5	(-5.5)	-0.7	(-7.7)	-0.6	(-6.6)	-0.3	(-3.3)	-0.6	(-6.6)
Aug	---	-0.6	(-7.1)	-0.7	(-8.3)	-0.5	(-5.9)	-0.7	(-8.3)	-0.7	(-8.3)	-0.4	(-4.7)	-0.7	(-8.3)
Sep	---	-0.6	(-7.4)	-0.7	(-8.6)	-0.5	(-6.1)	-0.7	(-8.6)	-0.7	(-8.6)	-0.4	(-4.9)	-0.7	(-8.6)
Oct	---	-0.6	(-7.7)	-0.8	(-10.3)	-0.6	(-7.7)	-0.7	(-9.0)	-0.8	(-10.3)	-0.5	(-6.5)	-0.7	(-9.0)
Nov	---	-0.6	(-7.7)	-0.9	(-11.6)	-0.7	(-9.0)	-0.7	(-9.0)	-0.9	(-11.6)	-0.6	(-7.7)	-0.8	(-10.3)
Dec	---	-0.5	(-5.3)	-0.8	(-8.5)	-0.7	(-7.4)	-0.6	(-6.3)	-0.8	(-8.5)	-0.5	(-5.3)	-0.7	(-7.4)
Average	---	-0.3	(-3.4)	-0.4	(-4.2)	-0.3	(-3.2)	-0.3	(-3.5)	-0.4	(-4.3)	-0.3	(-3.0)	-0.4	(-4.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 213. Monthly Water Surface Elevation Overall Average – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Surface Elevation (ft)															
Jan	4,253.0	4,251.8		4,251.8		4,251.7		4,251.9		4,251.7		4,251.6		4,251.7	
Feb	4,253.6	4,252.9		4,252.8		4,252.8		4,253.0		4,252.8		4,252.8		4,252.8	
Mar	4,254.0	4,253.4		4,253.4		4,253.5		4,253.5		4,253.4		4,253.4		4,253.4	
Apr	4,253.7	4,253.0		4,253.1		4,253.1		4,253.1		4,253.1		4,253.0		4,253.0	
May	4,253.4	4,252.4		4,252.4		4,252.4		4,252.5		4,252.4		4,252.3		4,252.3	
Jun	4,253.6	4,251.9		4,251.9		4,251.9		4,252.1		4,251.9		4,251.8		4,251.7	
Jul	4,253.5	4,251.7		4,251.7		4,251.7		4,251.9		4,251.7		4,251.6		4,251.6	
Aug	4,253.1	4,251.2		4,251.2		4,251.2		4,251.3		4,251.2		4,251.1		4,251.0	
Sep	4,252.8	4,250.7		4,250.7		4,250.6		4,250.8		4,250.7		4,250.6		4,250.5	
Oct	4,252.5	4,250.2		4,250.2		4,250.1		4,250.4		4,250.1		4,250.1		4,250.1	
Nov	4,252.5	4,250.0		4,249.9		4,249.9		4,250.1		4,249.9		4,249.8		4,249.8	
Dec	4,252.7	4,250.8		4,250.7		4,250.7		4,250.9		4,250.7		4,250.6		4,250.6	
Average	4,253.2	4,251.7		4,251.6		4,251.6		4,251.8		4,251.6		4,251.5		4,251.5	
Change in Water Surface Elevation Compared to No Action [ft (%)]															
Jan	---	---		0.0	(0.0)	-0.1	(-1.0)	0.1	(1.0)	-0.1	(-1.0)	-0.2	(-2.1)	-0.1	(-1.0)
Feb	---	---		0.0	(0.0)	0.0	(0.0)	0.1	(0.9)	0.0	(0.0)	-0.1	(-0.9)	-0.1	(-0.9)
Mar	---	---		0.0	(0.0)	0.1	(0.9)	0.1	(0.9)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Apr	---	---		0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.9)
May	---	---		0.1	(1.0)	0.1	(1.0)	0.2	(2.0)	0.1	(1.0)	0.0	(0.0)	0.0	(0.0)
Jun	---	---		0.0	(0.0)	0.0	(0.0)	0.2	(2.1)	0.0	(0.0)	-0.1	(-1.0)	-0.2	(-2.1)
Jul	---	---		0.0	(0.0)	0.0	(0.0)	0.2	(2.1)	0.0	(0.0)	-0.1	(-1.0)	-0.2	(-2.1)
Aug	---	---		0.0	(0.0)	-0.1	(-1.1)	0.1	(1.1)	0.0	(0.0)	-0.1	(-1.1)	-0.2	(-2.2)
Sep	---	---		0.0	(0.0)	-0.1	(-1.2)	0.1	(1.2)	-0.1	(-1.2)	-0.1	(-1.2)	-0.2	(-2.3)
Oct	---	---		0.0	(0.0)	-0.1	(-1.2)	0.2	(2.5)	-0.1	(-1.2)	-0.1	(-1.2)	-0.1	(-1.2)
Nov	---	---		-0.1	(-1.3)	-0.1	(-1.3)	0.1	(1.3)	-0.1	(-1.3)	-0.2	(-2.5)	-0.2	(-2.5)
Dec	---	---		-0.1	(-1.2)	-0.1	(-1.2)	0.1	(1.2)	-0.1	(-1.2)	-0.2	(-2.3)	-0.2	(-2.3)
Average	---	---		0.0	(0.0)	0.0	(-0.3)	0.1	(1.4)	0.0	(-0.4)	-0.1	(-1.1)	-0.1	(-1.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]															
Jan	---	-1.2	(-11.1)	-1.2	(-11.1)	-1.3	(-12.0)	-1.1	(-10.1)	-1.3	(-12.0)	-1.4	(-12.9)	-1.3	(-12.0)
Feb	---	-0.8	(-7.0)	-0.8	(-7.0)	-0.8	(-7.0)	-0.7	(-6.1)	-0.8	(-7.0)	-0.9	(-7.9)	-0.9	(-7.9)
Mar	---	-0.6	(-5.1)	-0.6	(-5.1)	-0.5	(-4.2)	-0.5	(-4.2)	-0.6	(-5.1)	-0.6	(-5.1)	-0.6	(-5.1)
Apr	---	-0.7	(-6.1)	-0.6	(-5.2)	-0.6	(-5.2)	-0.6	(-5.2)	-0.7	(-6.1)	-0.7	(-6.1)	-0.8	(-6.9)
May	---	-1.1	(-9.8)	-1.0	(-8.9)	-1.0	(-8.9)	-0.9	(-8.0)	-1.0	(-8.9)	-1.1	(-9.8)	-1.1	(-9.8)
Jun	---	-1.7	(-14.8)	-1.7	(-14.8)	-1.7	(-14.8)	-1.5	(-13.1)	-1.7	(-14.8)	-1.8	(-15.7)	-1.9	(-16.6)
Jul	---	-1.8	(-15.9)	-1.8	(-15.9)	-1.8	(-15.9)	-1.6	(-14.1)	-1.8	(-15.9)	-1.9	(-16.7)	-2.0	(-17.6)
Aug	---	-1.9	(-17.4)	-1.9	(-17.4)	-2.0	(-18.3)	-1.8	(-16.4)	-1.9	(-17.4)	-2.0	(-18.3)	-2.1	(-19.2)
Sep	---	-2.1	(-19.7)	-2.1	(-19.7)	-2.2	(-20.7)	-2.0	(-18.8)	-2.2	(-20.7)	-2.2	(-20.7)	-2.3	(-21.6)
Oct	---	-2.3	(-22.2)	-2.3	(-22.2)	-2.4	(-23.2)	-2.1	(-20.3)	-2.4	(-23.2)	-2.4	(-23.2)	-2.4	(-23.2)
Nov	---	-2.5	(-24.2)	-2.6	(-25.1)	-2.6	(-25.1)	-2.4	(-23.2)	-2.6	(-25.1)	-2.7	(-26.1)	-2.7	(-26.1)
Dec	---	-1.9	(-18.0)	-2.0	(-19.0)	-2.0	(-19.0)	-1.8	(-17.1)	-2.0	(-19.0)	-2.1	(-19.9)	-2.1	(-19.9)
Average	---	-1.6	(-14.0)	-1.6	(-14.0)	-1.6	(-14.3)	-1.4	(-12.8)	-1.6	(-14.3)	-1.7	(-14.9)	-1.7	(-15.2)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 214. Monthly Water Surface Elevation Normal Year (2005) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,253.7	4,251.8	4,251.9	4,251.9	4,251.9	4,251.9	4,251.8	4,251.8
Feb	4,254.3	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2	4,254.2
Mar	4,254.4	4,254.3	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.3
Apr	4,253.5	4,254.1	4,254.2	4,254.1	4,254.1	4,254.2	4,254.1	4,254.1
May	4,252.9	4,253.8	4,253.9	4,253.9	4,253.9	4,253.9	4,253.8	4,253.8
Jun	4,254.3	4,254.2	4,254.2	4,254.2	4,254.1	4,254.1	4,254.2	4,254.2
Jul	4,254.3	4,254.3	4,254.2	4,254.2	4,254.2	4,254.2	4,254.3	4,254.3
Aug	4,254.1	4,254.1	4,254.3	4,254.3	4,254.3	4,254.3	4,254.2	4,254.2
Sep	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1
Oct	4,253.7	4,253.5	4,253.5	4,253.5	4,253.6	4,253.5	4,253.5	4,253.5
Nov	4,253.3	4,252.9	4,252.9	4,252.9	4,253.0	4,252.9	4,252.9	4,252.9
Dec	4,253.1	4,252.6	4,252.7	4,252.7	4,252.8	4,252.7	4,252.6	4,252.7
Average	4,253.8	4,253.7	4,253.7	4,253.7	4,253.7	4,253.7	4,253.7	4,253.7
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.4)	0.0 (0.4)	0.0 (0.4)	0.0 (0.5)	0.0 (0.3)	0.0 (0.3)
Feb	---	---	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.2)	0.0 (0.1)
Mar	---	---	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.0)
Apr	---	---	0.0 (0.3)	0.0 (0.3)	0.0 (0.2)	0.0 (0.3)	0.0 (0.1)	0.0 (0.0)
May	---	---	0.1 (0.7)	0.1 (0.7)	0.1 (0.6)	0.1 (0.8)	0.0 (-0.1)	0.0 (0.1)
Jun	---	---	-0.1 (-0.4)	0.0 (-0.3)	-0.1 (-0.5)	-0.1 (-0.5)	0.0 (0.2)	0.0 (-0.1)
Jul	---	---	-0.1 (-0.5)	-0.1 (-0.5)	-0.1 (-0.5)	-0.1 (-0.6)	0.0 (-0.1)	0.0 (-0.1)
Aug	---	---	0.1 (0.9)	0.1 (1.0)	0.1 (1.0)	0.1 (0.9)	0.1 (0.8)	0.1 (0.8)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.4)	0.0 (-0.1)	0.0 (-0.4)	0.0 (0.1)
Nov	---	---	0.1 (0.6)	0.1 (0.6)	0.1 (1.0)	0.1 (0.5)	0.0 (-0.3)	0.0 (0.3)
Dec	---	---	0.1 (0.6)	0.1 (0.6)	0.1 (1.1)	0.1 (0.5)	0.0 (-0.3)	0.0 (0.3)
Average	---	---	0.0 (0.2)	0.0 (0.2)	0.0 (0.3)	0.0 (0.2)	0.0 (0.0)	0.0 (0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-1.9 (-16.2)	-1.8 (-15.9)	-1.8 (-15.9)	-1.8 (-15.9)	-1.8 (-15.8)	-1.8 (-16.0)	-1.8 (-16.0)
Feb	---	-0.2 (-1.6)	-0.2 (-1.4)	-0.2 (-1.4)	-0.2 (-1.4)	-0.2 (-1.4)	-0.2 (-1.4)	-0.2 (-1.5)
Mar	---	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.2)
Apr	---	0.6 (5.1)	0.6 (5.4)	0.6 (5.4)	0.6 (5.3)	0.6 (5.4)	0.6 (5.2)	0.6 (5.1)
May	---	0.8 (7.8)	0.9 (8.5)	0.9 (8.5)	0.9 (8.4)	0.9 (8.6)	0.8 (7.7)	0.9 (7.9)
Jun	---	-0.1 (-0.6)	-0.1 (-1.0)	-0.1 (-0.9)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-0.4)	-0.1 (-0.7)
Jul	---	0.0 (-0.2)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.8)	0.0 (-0.3)	0.0 (-0.3)
Aug	---	0.0 (0.2)	0.1 (1.1)	0.1 (1.2)	0.1 (1.2)	0.1 (1.1)	0.1 (0.9)	0.1 (0.9)
Sep	---	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.1)	0.0 (0.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.1)
Oct	---	-0.1 (-1.1)	-0.1 (-1.2)	-0.1 (-1.2)	-0.1 (-0.7)	-0.1 (-1.2)	-0.2 (-1.5)	-0.1 (-1.0)
Nov	---	-0.4 (-3.8)	-0.4 (-3.2)	-0.4 (-3.2)	-0.3 (-2.8)	-0.4 (-3.3)	-0.4 (-4.0)	-0.4 (-3.5)
Dec	---	-0.4 (-4.1)	-0.4 (-3.6)	-0.4 (-3.6)	-0.3 (-3.0)	-0.4 (-3.7)	-0.5 (-4.4)	-0.4 (-3.8)
Average	---	-0.1 (-1.3)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-0.9)	-0.1 (-1.1)	-0.1 (-1.2)	-0.1 (-1.1)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 215. Monthly Water Surface Elevation Wet Year (1997) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,252.5	4,252.6	4,252.9	4,252.8	4,252.5	4,252.7	4,252.8	4,253.2
Feb	4,253.2	4,253.5	4,253.7	4,253.6	4,253.3	4,253.6	4,253.6	4,253.9
Mar	4,253.4	4,253.9	4,254.1	4,254.0	4,253.7	4,254.0	4,254.0	4,254.1
Apr	4,252.5	4,252.7	4,253.0	4,252.9	4,252.6	4,252.8	4,252.8	4,253.0
May	4,252.1	4,252.0	4,252.3	4,252.1	4,251.9	4,252.1	4,252.1	4,252.3
Jun	4,253.9	4,253.6	4,253.7	4,253.6	4,253.5	4,253.6	4,253.6	4,253.8
Jul	4,254.2	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.1	4,254.2
Aug	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3	4,254.3
Sep	4,254.1	4,254.0	4,254.0	4,254.0	4,254.0	4,254.0	4,254.0	4,254.0
Oct	4,253.8	4,253.2	4,253.4	4,253.4	4,253.3	4,253.4	4,253.2	4,253.2
Nov	4,254.2	4,252.6	4,252.8	4,252.8	4,252.8	4,252.8	4,252.5	4,252.6
Dec	4,254.3	4,253.2	4,253.4	4,253.4	4,253.3	4,253.4	4,253.1	4,253.2
Average	4,253.5	4,253.3	4,253.5	4,253.4	4,253.3	4,253.4	4,253.4	4,253.5
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.3 (2.9)	0.2 (1.9)	-0.1 (-1.0)	0.1 (1.0)	0.2 (1.9)	0.6 (5.7)
Feb	---	---	0.2 (1.8)	0.1 (0.9)	-0.2 (-1.8)	0.1 (0.9)	0.1 (0.9)	0.4 (3.5)
Mar	---	---	0.2 (1.7)	0.1 (0.9)	-0.2 (-1.7)	0.1 (0.9)	0.1 (0.9)	0.2 (1.7)
Apr	---	---	0.3 (2.8)	0.1 (0.9)	-0.1 (-0.9)	0.1 (0.9)	0.1 (0.9)	0.3 (2.8)
May	---	---	0.3 (3.0)	0.1 (1.0)	-0.2 (-2.0)	0.1 (1.0)	0.1 (1.0)	0.3 (3.0)
Jun	---	---	0.1 (0.9)	0.0 (0.0)	-0.1 (-0.9)	0.0 (0.0)	0.0 (0.0)	0.2 (1.7)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.8)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	0.2 (1.8)	0.2 (1.8)	0.1 (0.9)	0.2 (1.8)	0.0 (0.0)	0.0 (0.0)
Nov	---	---	0.2 (1.9)	0.2 (1.9)	0.1 (1.0)	0.2 (1.9)	-0.1 (-1.0)	0.0 (0.0)
Dec	---	---	0.2 (1.8)	0.2 (1.8)	0.1 (0.9)	0.2 (1.8)	-0.1 (-0.9)	0.0 (0.0)
Average	---	---	0.2 (1.5)	0.1 (0.9)	0.0 (-0.4)	0.1 (0.8)	0.0 (0.3)	0.2 (1.6)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.1 (1.0)	0.4 (3.9)	0.3 (2.9)	0.0 (0.0)	0.2 (1.9)	0.3 (2.9)	0.7 (6.8)
Feb	---	0.3 (2.7)	0.5 (4.5)	0.4 (3.6)	0.1 (0.9)	0.4 (3.6)	0.4 (3.6)	0.7 (6.3)
Mar	---	0.6 (5.4)	0.8 (7.2)	0.7 (6.3)	0.4 (3.6)	0.7 (6.3)	0.7 (6.3)	0.8 (7.2)
Apr	---	0.3 (2.9)	0.6 (5.9)	0.4 (3.9)	0.2 (2.0)	0.4 (3.9)	0.4 (3.9)	0.6 (5.9)
May	---	-0.1 (-1.0)	0.2 (2.0)	0.0 (0.0)	-0.3 (-3.0)	0.0 (0.0)	0.0 (0.0)	0.2 (2.0)
Jun	---	-0.3 (-2.6)	-0.2 (-1.7)	-0.3 (-2.6)	-0.4 (-3.4)	-0.3 (-2.6)	-0.3 (-2.6)	-0.1 (-0.9)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.8)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)
Oct	---	-0.6 (-5.2)	-0.4 (-3.4)	-0.4 (-3.4)	-0.5 (-4.3)	-0.4 (-3.4)	-0.6 (-5.2)	-0.6 (-5.2)
Nov	---	-1.6 (-13.3)	-1.4 (-11.6)	-1.4 (-11.6)	-1.5 (-12.4)	-1.4 (-11.6)	-1.7 (-14.1)	-1.6 (-13.3)
Dec	---	-1.1 (-9.1)	-0.9 (-7.4)	-0.9 (-7.4)	-1.0 (-8.2)	-0.9 (-7.4)	-1.2 (-9.9)	-1.1 (-9.1)
Average	---	-0.2 (-1.8)	0.0 (-0.4)	-0.1 (-1.0)	-0.3 (-2.3)	-0.1 (-1.0)	-0.2 (-1.5)	0.0 (-0.3)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 216. Monthly Water Surface Elevation Dry Year (2004) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,251.4	4,252.1	4,252.2	4,252.2	4,252.2	4,252.2	4,252.0	4,252.1
Feb	4,253.3	4,254.1	4,254.2	4,254.2	4,254.2	4,254.2	4,254.1	4,254.1
Mar	4,254.3	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4	4,254.4
Apr	4,253.1	4,253.6	4,253.6	4,253.6	4,253.6	4,253.6	4,253.6	4,253.6
May	4,252.7	4,252.4	4,252.5	4,252.5	4,252.5	4,252.5	4,252.5	4,252.4
Jun	4,251.6	4,248.7	4,248.5	4,248.6	4,248.8	4,248.6	4,248.9	4,248.5
Jul	4,251.2	4,246.1	4,245.8	4,245.8	4,246.2	4,245.9	4,246.1	4,245.7
Aug	4,250.6	4,244.7	4,244.6	4,244.6	4,244.7	4,244.6	4,244.5	4,244.5
Sep	4,250.3	4,244.7	4,244.6	4,244.6	4,244.7	4,244.6	4,244.5	4,244.6
Oct	4,249.9	4,244.1	4,243.9	4,243.9	4,244.2	4,243.9	4,243.8	4,244.0
Nov	4,249.9	4,244.5	4,244.4	4,244.4	4,244.5	4,244.4	4,244.3	4,244.5
Dec	4,251.6	4,248.1	4,248.1	4,248.1	4,248.2	4,248.1	4,248.1	4,248.1
Average	4,251.6	4,248.9	4,248.9	4,248.9	4,249.0	4,248.9	4,248.9	4,248.9
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)	-0.1 (-1.0)	0.0 (0.0)
Feb	---	---	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	-0.1 (-0.8)	0.0 (0.0)
Mar	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	---	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)	0.1 (1.0)	0.0 (0.0)
Jun	---	---	-0.2 (-3.1)	-0.1 (-1.5)	0.1 (1.5)	-0.1 (-1.5)	0.2 (3.1)	-0.2 (-3.1)
Jul	---	---	-0.3 (-7.6)	-0.3 (-7.6)	0.1 (2.5)	-0.2 (-5.1)	0.0 (0.0)	-0.4 (-10.1)
Aug	---	---	-0.1 (-3.9)	-0.2 (-7.8)	-0.1 (-3.9)	-0.1 (-3.9)	-0.2 (-7.8)	-0.2 (-7.8)
Sep	---	---	-0.1 (-3.9)	-0.1 (-3.9)	0.0 (0.0)	-0.1 (-3.9)	-0.2 (-7.8)	-0.1 (-3.9)
Oct	---	---	-0.2 (-10.3)	-0.2 (-10.3)	0.1 (5.1)	-0.2 (-10.3)	-0.3 (-15.4)	-0.1 (-5.1)
Nov	---	---	-0.1 (-4.3)	-0.1 (-4.3)	0.0 (0.0)	-0.1 (-4.3)	-0.2 (-8.5)	0.0 (0.0)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	-0.1 (-0.9)	-0.1 (-0.9)	0.0 (0.7)	0.0 (-0.6)	-0.1 (-1.0)	-0.1 (-1.2)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.7 (7.6)	0.8 (8.6)	0.8 (8.6)	0.8 (8.6)	0.8 (8.6)	0.6 (6.5)	0.7 (7.6)
Feb	---	0.8 (7.2)	0.9 (8.1)	0.9 (8.1)	0.9 (8.1)	0.9 (8.1)	0.7 (6.3)	0.8 (7.2)
Mar	---	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)
Apr	---	0.5 (4.6)	0.5 (4.6)	0.5 (4.6)	0.5 (4.6)	0.5 (4.6)	0.5 (4.6)	0.5 (4.6)
May	---	-0.3 (-2.8)	-0.2 (-1.9)	-0.2 (-1.9)	-0.2 (-1.9)	-0.2 (-1.9)	-0.2 (-1.9)	-0.3 (-2.8)
Jun	---	-2.9 (-30.7)	-3.1 (-32.8)	-3.0 (-31.7)	-2.8 (-29.6)	-3.0 (-31.7)	-2.7 (-28.6)	-3.1 (-32.8)
Jul	---	-5.1 (-56.4)	-5.4 (-59.7)	-5.4 (-59.7)	-5.0 (-55.2)	-5.3 (-58.6)	-5.1 (-56.4)	-5.5 (-60.8)
Aug	---	-5.9 (-69.8)	-6.0 (-71.0)	-6.1 (-72.2)	-6.0 (-71.0)	-6.0 (-71.0)	-6.1 (-72.2)	-6.1 (-72.2)
Sep	---	-5.6 (-68.7)	-5.7 (-69.9)	-5.7 (-69.9)	-5.6 (-68.7)	-5.7 (-69.9)	-5.8 (-71.2)	-5.7 (-69.9)
Oct	---	-5.8 (-74.8)	-6.0 (-77.4)	-6.0 (-77.4)	-5.7 (-73.5)	-6.0 (-77.4)	-6.1 (-78.7)	-5.9 (-76.1)
Nov	---	-5.4 (-69.7)	-5.5 (-71.0)	-5.5 (-71.0)	-5.4 (-69.7)	-5.5 (-71.0)	-5.6 (-72.3)	-5.4 (-69.7)
Dec	---	-3.5 (-37.0)	-3.5 (-37.0)	-3.5 (-37.0)	-3.4 (-36.0)	-3.5 (-37.0)	-3.5 (-37.0)	-3.5 (-37.0)
Average	---	-2.7 (-28.4)	-2.8 (-29.0)	-2.8 (-29.0)	-2.7 (-27.9)	-2.7 (-28.8)	-2.8 (-29.1)	-2.8 (-29.3)

* Percent changes are calculated using a minimum reservoir water elevation of 4242.15 feet.

Table 217. Monthly Surface Area Overall Average – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	5,214	5,250		5,200		5,210		5,303		5,195		5,197		5,194	
Feb	5,453	5,488		5,453		5,461		5,539		5,449		5,445		5,444	
Mar	5,636	5,664		5,647		5,653		5,685		5,644		5,643		5,640	
Apr	5,496	5,517		5,502		5,513		5,531		5,497		5,496		5,494	
May	5,350	5,373		5,354		5,365		5,392		5,349		5,351		5,347	
Jun	5,440	5,452		5,422		5,434		5,471		5,418		5,425		5,421	
Jul	5,404	5,417		5,383		5,395		5,434		5,380		5,390		5,384	
Aug	5,266	5,265		5,246		5,257		5,282		5,243		5,251		5,248	
Sep	5,132	5,135		5,118		5,129		5,166		5,114		5,121		5,115	
Oct	5,012	5,027		4,986		4,998		5,072		4,981		4,988		4,991	
Nov	4,986	5,028		4,955		4,967		5,080		4,949		4,956		4,960	
Dec	5,088	5,124		5,062		5,071		5,175		5,056		5,060		5,060	
Average	5,290	5,312		5,278		5,288		5,344		5,273		5,277		5,275	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		-50	(-1.0)	-40	(-0.8)	53	(1.0)	-55	(-1.1)	-53	(-1.0)	-56	(-1.1)
Feb	---	---		-35	(-0.6)	-27	(-0.5)	51	(0.9)	-39	(-0.7)	-44	(-0.8)	-45	(-0.8)
Mar	---	---		-17	(-0.3)	-12	(-0.2)	21	(0.4)	-20	(-0.3)	-21	(-0.4)	-24	(-0.4)
Apr	---	---		-15	(-0.3)	-5	(-0.1)	14	(0.3)	-20	(-0.4)	-21	(-0.4)	-23	(-0.4)
May	---	---		-18	(-0.3)	-8	(-0.1)	20	(0.4)	-23	(-0.4)	-21	(-0.4)	-26	(-0.5)
Jun	---	---		-30	(-0.5)	-18	(-0.3)	19	(0.4)	-34	(-0.6)	-26	(-0.5)	-30	(-0.6)
Jul	---	---		-34	(-0.6)	-22	(-0.4)	17	(0.3)	-37	(-0.7)	-26	(-0.5)	-33	(-0.6)
Aug	---	---		-19	(-0.4)	-8	(-0.2)	17	(0.3)	-22	(-0.4)	-14	(-0.3)	-17	(-0.3)
Sep	---	---		-17	(-0.3)	-7	(-0.1)	31	(0.6)	-22	(-0.4)	-14	(-0.3)	-21	(-0.4)
Oct	---	---		-41	(-0.8)	-29	(-0.6)	45	(0.9)	-46	(-0.9)	-39	(-0.8)	-36	(-0.7)
Nov	---	---		-72	(-1.4)	-61	(-1.2)	52	(1.0)	-79	(-1.6)	-71	(-1.4)	-68	(-1.4)
Dec	---	---		-63	(-1.2)	-53	(-1.0)	50	(1.0)	-69	(-1.3)	-64	(-1.2)	-64	(-1.2)
Average	---	---		-34	(-0.6)	-24	(-0.5)	32	(0.6)	-39	(-0.7)	-35	(-0.7)	-37	(-0.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	36	(0.7)	-14	(-0.3)	-4	(-0.1)	90	(1.7)	-19	(-0.4)	-17	(-0.3)	-19	(-0.4)
Feb	---	35	(0.6)	1	(0.0)	8	(0.2)	86	(1.6)	-4	(-0.1)	-8	(-0.2)	-9	(-0.2)
Mar	---	28	(0.5)	12	(0.2)	17	(0.3)	49	(0.9)	9	(0.2)	7	(0.1)	5	(0.1)
Apr	---	21	(0.4)	6	(0.1)	17	(0.3)	35	(0.6)	1	(0.0)	0	(0.0)	-2	(0.0)
May	---	22	(0.4)	4	(0.1)	15	(0.3)	42	(0.8)	-1	(0.0)	1	(0.0)	-4	(-0.1)
Jun	---	12	(0.2)	-17	(-0.3)	-6	(-0.1)	31	(0.6)	-22	(-0.4)	-14	(-0.3)	-18	(-0.3)
Jul	---	12	(0.2)	-21	(-0.4)	-10	(-0.2)	29	(0.5)	-25	(-0.5)	-14	(-0.3)	-20	(-0.4)
Aug	---	-1	(0.0)	-20	(-0.4)	-9	(-0.2)	16	(0.3)	-23	(-0.4)	-15	(-0.3)	-18	(-0.3)
Sep	---	3	(0.1)	-14	(-0.3)	-3	(-0.1)	34	(0.7)	-18	(-0.4)	-11	(-0.2)	-17	(-0.3)
Oct	---	15	(0.3)	-25	(-0.5)	-14	(-0.3)	60	(1.2)	-30	(-0.6)	-24	(-0.5)	-20	(-0.4)
Nov	---	42	(0.8)	-31	(-0.6)	-19	(-0.4)	94	(1.9)	-37	(-0.7)	-30	(-0.6)	-27	(-0.5)
Dec	---	37	(0.7)	-26	(-0.5)	-16	(-0.3)	87	(1.7)	-32	(-0.6)	-27	(-0.5)	-27	(-0.5)
Average	---	22	(0.4)	-12	(-0.2)	-2	(0.0)	54	(1.0)	-17	(-0.3)	-13	(-0.2)	-15	(-0.3)

Table 218. Monthly Surface Area Normal Year (2005) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	5,486	5,349		5,271		5,314		5,328		5,274		5,360		5,307	
Feb	5,770	5,770		5,770		5,770		5,770		5,770		5,770		5,770	
Mar	5,775	5,778		5,780		5,780		5,779		5,780		5,781		5,780	
Apr	5,427	5,483		5,557		5,555		5,501		5,555		5,535		5,528	
May	5,157	5,228		5,289		5,288		5,261		5,284		5,275		5,244	
Jun	5,751	5,758		5,762		5,762		5,758		5,762		5,758		5,760	
Jul	5,767	5,767		5,767		5,767		5,768		5,767		5,767		5,767	
Aug	5,695	5,695		5,697		5,695		5,695		5,693		5,692		5,692	
Sep	5,692	5,692		5,692		5,692		5,692		5,688		5,692		5,692	
Oct	5,485	5,488		5,459		5,458		5,490		5,452		5,458		5,481	
Nov	5,321	5,332		5,296		5,290		5,344		5,285		5,290		5,312	
Dec	5,217	5,225		5,190		5,183		5,238		5,180		5,183		5,204	
Average	5,545	5,547		5,544		5,546		5,552		5,541		5,547		5,545	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		-78	(-1.5)	-34	(-0.6)	-21	(-0.4)	-75	(-1.4)	12	(0.2)	-41	(-0.8)
Feb	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---		2	(0.0)	2	(0.0)	1	(0.0)	2	(0.0)	2	(0.0)	2	(0.0)
Apr	---	---		74	(1.3)	71	(1.3)	18	(0.3)	72	(1.3)	52	(0.9)	45	(0.8)
May	---	---		62	(1.2)	60	(1.2)	33	(0.6)	57	(1.1)	48	(0.9)	16	(0.3)
Jun	---	---		4	(0.1)	4	(0.1)	0	(0.0)	4	(0.1)	0	(0.0)	1	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	1	(0.0)	0	(0.0)	-1	(0.0)	0	(0.0)
Aug	---	---		2	(0.0)	1	(0.0)	1	(0.0)	-2	(0.0)	-3	(0.0)	-3	(-0.1)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	-4	(-0.1)	0	(0.0)	0	(0.0)
Oct	---	---		-29	(-0.5)	-30	(-0.5)	2	(0.0)	-35	(-0.6)	-29	(-0.5)	-7	(-0.1)
Nov	---	---		-36	(-0.7)	-42	(-0.8)	12	(0.2)	-46	(-0.9)	-42	(-0.8)	-19	(-0.4)
Dec	---	---		-36	(-0.7)	-42	(-0.8)	13	(0.3)	-46	(-0.9)	-43	(-0.8)	-21	(-0.4)
Average	---	---		-3	(-0.1)	-1	(0.0)	5	(0.1)	-6	(-0.1)	0	(0.0)	-2	(0.0)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-137	(-2.5)	-215	(-3.9)	-171	(-3.1)	-158	(-2.9)	-212	(-3.9)	-125	(-2.3)	-179	(-3.3)
Feb	---	0	(0.0)	-1	(0.0)	0	(0.0)	0	(0.0)	-1	(0.0)	0	(0.0)	0	(0.0)
Mar	---	3	(0.1)	5	(0.1)	6	(0.1)	4	(0.1)	5	(0.1)	6	(0.1)	5	(0.1)
Apr	---	57	(1.0)	131	(2.4)	128	(2.4)	75	(1.4)	129	(2.4)	108	(2.0)	102	(1.9)
May	---	71	(1.4)	133	(2.6)	131	(2.5)	104	(2.0)	128	(2.5)	119	(2.3)	87	(1.7)
Jun	---	8	(0.1)	11	(0.2)	12	(0.2)	7	(0.1)	11	(0.2)	8	(0.1)	9	(0.2)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	1	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	0	(0.0)	2	(0.0)	0	(0.0)	0	(0.0)	-2	(0.0)	-3	(-0.1)	-3	(-0.1)
Sep	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	-5	(-0.1)	0	(0.0)	0	(0.0)
Oct	---	3	(0.0)	-26	(-0.5)	-27	(-0.5)	5	(0.1)	-33	(-0.6)	-27	(-0.5)	-4	(-0.1)
Nov	---	11	(0.2)	-25	(-0.5)	-31	(-0.6)	23	(0.4)	-35	(-0.7)	-31	(-0.6)	-8	(-0.2)
Dec	---	8	(0.2)	-28	(-0.5)	-34	(-0.6)	21	(0.4)	-38	(-0.7)	-35	(-0.7)	-13	(-0.2)
Average	---	2	(0.0)	-1	(0.0)	1	(0.0)	7	(0.1)	-4	(-0.1)	2	(0.0)	0	(0.0)

Table 219. Monthly Surface Area Wet Year (1997) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,971	5,154	5,021	5,003	5,238	5,002	5,015	4,977
Feb	5,260	5,433	5,314	5,296	5,518	5,295	5,307	5,270
Mar	5,344	5,525	5,423	5,408	5,610	5,406	5,418	5,387
Apr	4,938	5,106	4,974	4,967	5,195	4,954	4,962	4,940
May	4,775	4,944	4,808	4,793	5,053	4,789	4,792	4,764
Jun	5,579	5,649	5,571	5,563	5,686	5,564	5,562	5,554
Jul	5,704	5,709	5,704	5,704	5,709	5,705	5,705	5,707
Aug	5,758	5,762	5,761	5,761	5,763	5,761	5,761	5,762
Sep	5,684	5,684	5,683	5,683	5,682	5,683	5,684	5,683
Oct	5,571	5,607	5,558	5,556	5,612	5,556	5,558	5,558
Nov	5,733	5,760	5,725	5,724	5,762	5,723	5,725	5,726
Dec	5,759	5,760	5,761	5,761	5,760	5,761	5,761	5,761
Average	5,423	5,508	5,442	5,435	5,549	5,433	5,437	5,424
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-132 (-2.6)	-151 (-2.9)	84 (1.6)	-152 (-2.9)	-139 (-2.7)	-177 (-3.4)
Feb	---	---	-119 (-2.2)	-137 (-2.5)	85 (1.6)	-138 (-2.5)	-126 (-2.3)	-163 (-3.0)
Mar	---	---	-102 (-1.8)	-117 (-2.1)	85 (1.5)	-119 (-2.1)	-107 (-1.9)	-138 (-2.5)
Apr	---	---	-132 (-2.6)	-139 (-2.7)	90 (1.8)	-151 (-3.0)	-144 (-2.8)	-166 (-3.2)
May	---	---	-136 (-2.8)	-151 (-3.1)	109 (2.2)	-155 (-3.1)	-152 (-3.1)	-181 (-3.7)
Jun	---	---	-78 (-1.4)	-86 (-1.5)	37 (0.7)	-85 (-1.5)	-87 (-1.5)	-95 (-1.7)
Jul	---	---	-5 (-0.1)	-5 (-0.1)	0 (0.0)	-4 (-0.1)	-4 (-0.1)	-2 (0.0)
Aug	---	---	-1 (0.0)	-1 (0.0)	1 (0.0)	-1 (0.0)	-1 (0.0)	0 (0.0)
Sep	---	---	-1 (0.0)	-2 (0.0)	-2 (0.0)	-2 (0.0)	-1 (0.0)	-1 (0.0)
Oct	---	---	-50 (-0.9)	-51 (-0.9)	4 (0.1)	-52 (-0.9)	-50 (-0.9)	-50 (-0.9)
Nov	---	---	-35 (-0.6)	-36 (-0.6)	3 (0.0)	-36 (-0.6)	-35 (-0.6)	-34 (-0.6)
Dec	---	---	1 (0.0)	1 (0.0)	0 (0.0)	1 (0.0)	1 (0.0)	0 (0.0)
Average	---	---	-66 (-1.2)	-73 (-1.3)	41 (0.7)	-74 (-1.4)	-70 (-1.3)	-84 (-1.5)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	---	50 (1.0)	32 (0.6)	266 (5.4)	30 (0.6)	44 (0.9)	6 (0.1)
Feb	---	---	54 (1.0)	35 (0.7)	258 (4.9)	34 (0.7)	46 (0.9)	9 (0.2)
Mar	---	---	80 (1.5)	64 (1.2)	266 (5.0)	62 (1.2)	74 (1.4)	43 (0.8)
Apr	---	---	36 (0.7)	28 (0.6)	257 (5.2)	16 (0.3)	24 (0.5)	2 (0.0)
May	---	---	33 (0.7)	18 (0.4)	278 (5.8)	14 (0.3)	17 (0.4)	-11 (-0.2)
Jun	---	---	-8 (-0.1)	-16 (-0.3)	107 (1.9)	-15 (-0.3)	-17 (-0.3)	-25 (-0.4)
Jul	---	---	1 (0.0)	1 (0.0)	5 (0.1)	2 (0.0)	2 (0.0)	3 (0.1)
Aug	---	---	3 (0.1)	3 (0.1)	4 (0.1)	3 (0.1)	3 (0.1)	3 (0.1)
Sep	---	---	-1 (0.0)	-1 (0.0)	-2 (0.0)	-1 (0.0)	0 (0.0)	-1 (0.0)
Oct	---	---	-14 (-0.2)	-15 (-0.3)	40 (0.7)	-16 (-0.3)	-14 (-0.2)	-14 (-0.2)
Nov	---	---	-8 (-0.1)	-9 (-0.2)	30 (0.5)	-9 (-0.2)	-7 (-0.1)	-7 (-0.1)
Dec	---	---	1 (0.0)	1 (0.0)	1 (0.0)	1 (0.0)	1 (0.0)	1 (0.0)
Average	---	---	19 (0.3)	12 (0.2)	126 (2.3)	10 (0.2)	14 (0.3)	1 (0.0)

Table 220. Monthly Surface Area Dry Year (2004) – Lake Meredith (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,490	4,471	4,488	4,513	4,548	4,476	4,416	4,450
Feb	5,313	5,296	5,318	5,343	5,374	5,307	5,246	5,279
Mar	5,750	5,758	5,767	5,769	5,770	5,767	5,748	5,758
Apr	5,214	5,262	5,262	5,275	5,283	5,262	5,238	5,258
May	5,028	5,004	4,986	5,007	5,051	4,982	4,975	4,988
Jun	4,596	4,508	4,476	4,517	4,504	4,476	4,536	4,492
Jul	4,425	4,219	4,196	4,245	4,181	4,200	4,309	4,211
Aug	4,196	3,981	3,958	4,016	3,945	3,963	4,065	3,965
Sep	4,095	3,883	3,860	3,916	3,855	3,869	3,964	3,862
Oct	3,965	3,749	3,689	3,744	3,719	3,697	3,799	3,728
Nov	3,945	3,741	3,644	3,704	3,711	3,651	3,767	3,697
Dec	4,564	4,373	4,281	4,332	4,348	4,284	4,388	4,323
Average	4,632	4,521	4,494	4,532	4,524	4,495	4,537	4,501
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	17 (0.4)	42 (0.9)	77 (1.7)	5 (0.1)	-56 (-1.2)	-21 (-0.5)
Feb	---	---	22 (0.4)	47 (0.9)	77 (1.5)	11 (0.2)	-50 (-0.9)	-17 (-0.3)
Mar	---	---	9 (0.2)	10 (0.2)	11 (0.2)	8 (0.1)	-11 (-0.2)	0 (0.0)
Apr	---	---	1 (0.0)	14 (0.3)	21 (0.4)	0 (0.0)	-24 (-0.5)	-4 (-0.1)
May	---	---	-18 (-0.4)	3 (0.1)	47 (0.9)	-22 (-0.4)	-30 (-0.6)	-16 (-0.3)
Jun	---	---	-32 (-0.7)	10 (0.2)	-4 (-0.1)	-31 (-0.7)	28 (0.6)	-15 (-0.3)
Jul	---	---	-23 (-0.5)	26 (0.6)	-38 (-0.9)	-19 (-0.5)	90 (2.1)	-8 (-0.2)
Aug	---	---	-23 (-0.6)	35 (0.9)	-37 (-0.9)	-18 (-0.5)	83 (2.1)	-16 (-0.4)
Sep	---	---	-22 (-0.6)	33 (0.8)	-27 (-0.7)	-14 (-0.4)	81 (2.1)	-21 (-0.5)
Oct	---	---	-60 (-1.6)	-5 (-0.1)	-30 (-0.8)	-52 (-1.4)	50 (1.3)	-21 (-0.6)
Nov	---	---	-98 (-2.6)	-38 (-1.0)	-31 (-0.8)	-90 (-2.4)	26 (0.7)	-44 (-1.2)
Dec	---	---	-93 (-2.1)	-42 (-1.0)	-25 (-0.6)	-89 (-2.0)	14 (0.3)	-51 (-1.2)
Average	---	---	-27 (-0.6)	11 (0.2)	4 (0.1)	-26 (-0.6)	17 (0.4)	-19 (-0.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-19 (-0.4)	-2 (0.0)	23 (0.5)	59 (1.3)	-13 (-0.3)	-74 (-1.7)	-40 (-0.9)
Feb	---	-17 (-0.3)	6 (0.1)	30 (0.6)	61 (1.1)	-6 (-0.1)	-67 (-1.3)	-34 (-0.6)
Mar	---	8 (0.1)	17 (0.3)	18 (0.3)	19 (0.3)	16 (0.3)	-3 (0.0)	8 (0.1)
Apr	---	48 (0.9)	49 (0.9)	62 (1.2)	69 (1.3)	48 (0.9)	24 (0.5)	44 (0.8)
May	---	-24 (-0.5)	-42 (-0.8)	-21 (-0.4)	23 (0.5)	-46 (-0.9)	-53 (-1.1)	-40 (-0.8)
Jun	---	-88 (-1.9)	-120 (-2.6)	-79 (-1.7)	-92 (-2.0)	-120 (-2.6)	-60 (-1.3)	-104 (-2.3)
Jul	---	-205 (-4.6)	-228 (-5.2)	-179 (-4.0)	-243 (-5.5)	-225 (-5.1)	-116 (-2.6)	-214 (-4.8)
Aug	---	-214 (-5.1)	-237 (-5.7)	-179 (-4.3)	-251 (-6.0)	-233 (-5.5)	-131 (-3.1)	-230 (-5.5)
Sep	---	-212 (-5.2)	-234 (-5.7)	-179 (-4.4)	-239 (-5.8)	-226 (-5.5)	-131 (-3.2)	-232 (-5.7)
Oct	---	-216 (-5.5)	-276 (-7.0)	-221 (-5.6)	-246 (-6.2)	-268 (-6.8)	-166 (-4.2)	-237 (-6.0)
Nov	---	-203 (-5.2)	-301 (-7.6)	-241 (-6.1)	-234 (-5.9)	-294 (-7.4)	-177 (-4.5)	-247 (-6.3)
Dec	---	-191 (-4.2)	-284 (-6.2)	-233 (-5.1)	-216 (-4.7)	-280 (-6.1)	-177 (-3.9)	-242 (-5.3)
Average	---	-111 (-2.4)	-138 (-3.0)	-100 (-2.2)	-108 (-2.3)	-137 (-3.0)	-94 (-2.0)	-131 (-2.8)

Table 221. Monthly Surface Area Overall Average – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	5,214	4,729	4,715	4,706	4,779	4,704	4,663	4,675
Feb	5,453	5,157	5,152	5,145	5,195	5,143	5,116	5,120
Mar	5,636	5,394	5,394	5,398	5,430	5,394	5,369	5,360
Apr	5,496	5,221	5,238	5,235	5,257	5,232	5,200	5,192
May	5,350	4,946	4,981	4,975	4,989	4,972	4,931	4,922
Jun	5,440	4,767	4,779	4,778	4,848	4,774	4,738	4,716
Jul	5,404	4,714	4,699	4,697	4,775	4,697	4,671	4,649
Aug	5,266	4,498	4,492	4,484	4,558	4,488	4,456	4,438
Sep	5,132	4,287	4,291	4,283	4,350	4,285	4,261	4,231
Oct	5,012	4,097	4,083	4,078	4,172	4,079	4,066	4,042
Nov	4,986	4,010	3,986	3,976	4,072	3,976	3,936	3,944
Dec	5,088	4,340	4,316	4,304	4,395	4,305	4,257	4,276
Average	5,290	4,680	4,677	4,671	4,735	4,671	4,639	4,630
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-14 (-0.3)	-23 (-0.5)	50 (1.1)	-25 (-0.5)	-66 (-1.4)	-54 (-1.1)
Feb	---	---	-5 (-0.1)	-12 (-0.2)	39 (0.7)	-14 (-0.3)	-41 (-0.8)	-37 (-0.7)
Mar	---	---	0 (0.0)	4 (0.1)	35 (0.7)	0 (0.0)	-25 (-0.5)	-34 (-0.6)
Apr	---	---	18 (0.3)	14 (0.3)	36 (0.7)	11 (0.2)	-21 (-0.4)	-28 (-0.5)
May	---	---	35 (0.7)	30 (0.6)	43 (0.9)	26 (0.5)	-14 (-0.3)	-24 (-0.5)
Jun	---	---	11 (0.2)	10 (0.2)	81 (1.7)	7 (0.1)	-29 (-0.6)	-52 (-1.1)
Jul	---	---	-16 (-0.3)	-17 (-0.4)	61 (1.3)	-17 (-0.4)	-43 (-0.9)	-65 (-1.4)
Aug	---	---	-6 (-0.1)	-14 (-0.3)	61 (1.3)	-10 (-0.2)	-42 (-0.9)	-59 (-1.3)
Sep	---	---	4 (0.1)	-4 (-0.1)	63 (1.5)	-2 (-0.1)	-26 (-0.6)	-56 (-1.3)
Oct	---	---	-14 (-0.3)	-19 (-0.5)	75 (1.8)	-18 (-0.4)	-31 (-0.8)	-54 (-1.3)
Nov	---	---	-24 (-0.6)	-35 (-0.9)	62 (1.5)	-35 (-0.9)	-74 (-1.8)	-66 (-1.7)
Dec	---	---	-24 (-0.6)	-37 (-0.8)	54 (1.3)	-35 (-0.8)	-83 (-1.9)	-65 (-1.5)
Average	---	---	-3 (-0.1)	-9 (-0.2)	55 (1.2)	-9 (-0.2)	-41 (-0.9)	-50 (-1.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-485 (-9.3)	-499 (-9.6)	-508 (-9.7)	-435 (-8.3)	-510 (-9.8)	-551 (-10.6)	-539 (-10.3)
Feb	---	-296 (-5.4)	-301 (-5.5)	-308 (-5.6)	-258 (-4.7)	-310 (-5.7)	-337 (-6.2)	-333 (-6.1)
Mar	---	-242 (-4.3)	-242 (-4.3)	-238 (-4.2)	-206 (-3.7)	-242 (-4.3)	-267 (-4.7)	-276 (-4.9)
Apr	---	-276 (-5.0)	-258 (-4.7)	-262 (-4.8)	-240 (-4.4)	-265 (-4.8)	-296 (-5.4)	-304 (-5.5)
May	---	-405 (-7.6)	-370 (-6.9)	-375 (-7.0)	-362 (-6.8)	-378 (-7.1)	-419 (-7.8)	-428 (-8.0)
Jun	---	-672 (-12.4)	-661 (-12.2)	-662 (-12.2)	-592 (-10.9)	-665 (-12.2)	-701 (-12.9)	-724 (-13.3)
Jul	---	-690 (-12.8)	-706 (-13.1)	-708 (-13.1)	-629 (-11.6)	-707 (-13.1)	-734 (-13.6)	-756 (-14.0)
Aug	---	-768 (-14.6)	-774 (-14.7)	-782 (-14.9)	-707 (-13.4)	-777 (-14.8)	-810 (-15.4)	-827 (-15.7)
Sep	---	-845 (-16.5)	-841 (-16.4)	-849 (-16.5)	-782 (-15.2)	-847 (-16.5)	-872 (-17.0)	-901 (-17.6)
Oct	---	-915 (-18.3)	-928 (-18.5)	-934 (-18.6)	-840 (-16.8)	-933 (-18.6)	-946 (-18.9)	-969 (-19.3)
Nov	---	-976 (-19.6)	-1000 (-20.0)	-1010 (-20.3)	-914 (-18.3)	-1010 (-20.3)	-1050 (-21.1)	-1042 (-20.9)
Dec	---	-747 (-14.7)	-772 (-15.2)	-784 (-15.4)	-693 (-13.6)	-783 (-15.4)	-830 (-16.3)	-812 (-16.0)
Average	---	-610 (-11.5)	-613 (-11.6)	-618 (-11.7)	-555 (-10.5)	-619 (-11.7)	-651 (-12.3)	-659 (-12.5)

Table 222. Monthly Surface Area Normal Year (2005) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	5,486	4,685	4,700	4,700	4,703	4,706	4,697	4,698
Feb	5,770	5,696	5,704	5,704	5,704	5,706	5,704	5,704
Mar	5,775	5,771	5,772	5,772	5,772	5,772	5,771	5,770
Apr	5,427	5,697	5,717	5,713	5,711	5,718	5,703	5,697
May	5,157	5,543	5,582	5,582	5,575	5,587	5,538	5,549
Jun	5,751	5,727	5,709	5,710	5,701	5,705	5,734	5,724
Jul	5,767	5,762	5,748	5,748	5,748	5,745	5,760	5,760
Aug	5,695	5,706	5,747	5,749	5,750	5,745	5,742	5,739
Sep	5,692	5,687	5,687	5,688	5,690	5,687	5,688	5,687
Oct	5,485	5,421	5,415	5,419	5,448	5,416	5,402	5,426
Nov	5,321	5,127	5,151	5,153	5,177	5,148	5,112	5,138
Dec	5,217	5,018	5,042	5,045	5,068	5,040	5,003	5,028
Average	5,545	5,487	5,498	5,499	5,504	5,498	5,488	5,493
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	15 (0.3)	15 (0.3)	18 (0.4)	21 (0.4)	12 (0.3)	13 (0.3)
Feb	---	---	8 (0.1)	8 (0.1)	8 (0.1)	10 (0.2)	8 (0.1)	7 (0.1)
Mar	---	---	1 (0.0)	1 (0.0)	2 (0.0)	1 (0.0)	0 (0.0)	-1 (0.0)
Apr	---	---	20 (0.4)	15 (0.3)	13 (0.2)	20 (0.4)	6 (0.1)	0 (0.0)
May	---	---	40 (0.7)	40 (0.7)	33 (0.6)	45 (0.8)	-4 (-0.1)	6 (0.1)
Jun	---	---	-18 (-0.3)	-17 (-0.3)	-26 (-0.5)	-22 (-0.4)	7 (0.1)	-3 (-0.1)
Jul	---	---	-14 (-0.2)	-14 (-0.2)	-15 (-0.3)	-17 (-0.3)	-2 (0.0)	-2 (0.0)
Aug	---	---	42 (0.7)	43 (0.8)	44 (0.8)	39 (0.7)	36 (0.6)	33 (0.6)
Sep	---	---	0 (0.0)	1 (0.0)	4 (0.1)	0 (0.0)	1 (0.0)	1 (0.0)
Oct	---	---	-6 (-0.1)	-2 (0.0)	27 (0.5)	-5 (-0.1)	-19 (-0.4)	5 (0.1)
Nov	---	---	24 (0.5)	27 (0.5)	50 (1.0)	22 (0.4)	-15 (-0.3)	11 (0.2)
Dec	---	---	24 (0.5)	27 (0.5)	50 (1.0)	22 (0.4)	-15 (-0.3)	10 (0.2)
Average	---	---	11 (0.2)	12 (0.2)	17 (0.3)	11 (0.2)	1 (0.0)	7 (0.1)
Change in Contents Compared to Existing Conditions [acres (%)]								
Jan	---	-801 (-14.6)	-786 (-14.3)	-786 (-14.3)	-783 (-14.3)	-780 (-14.2)	-789 (-14.4)	-787 (-14.4)
Feb	---	-74 (-1.3)	-66 (-1.1)	-66 (-1.1)	-66 (-1.1)	-64 (-1.1)	-66 (-1.2)	-67 (-1.2)
Mar	---	-4 (-0.1)	-3 (0.0)	-3 (-0.1)	-2 (0.0)	-3 (0.0)	-4 (-0.1)	-5 (-0.1)
Apr	---	271 (5.0)	291 (5.4)	286 (5.3)	284 (5.2)	291 (5.4)	277 (5.1)	271 (5.0)
May	---	386 (7.5)	426 (8.3)	426 (8.3)	419 (8.1)	431 (8.4)	382 (7.4)	392 (7.6)
Jun	---	-24 (-0.4)	-41 (-0.7)	-40 (-0.7)	-50 (-0.9)	-46 (-0.8)	-17 (-0.3)	-27 (-0.5)
Jul	---	-5 (-0.1)	-19 (-0.3)	-19 (-0.3)	-19 (-0.3)	-22 (-0.4)	-7 (-0.1)	-7 (-0.1)
Aug	---	11 (0.2)	52 (0.9)	54 (0.9)	55 (1.0)	50 (0.9)	47 (0.8)	44 (0.8)
Sep	---	-6 (-0.1)	-6 (-0.1)	-4 (-0.1)	-2 (0.0)	-6 (-0.1)	-4 (-0.1)	-5 (-0.1)
Oct	---	-64 (-1.2)	-69 (-1.3)	-66 (-1.2)	-37 (-0.7)	-69 (-1.3)	-83 (-1.5)	-59 (-1.1)
Nov	---	-194 (-3.6)	-170 (-3.2)	-168 (-3.1)	-144 (-2.7)	-172 (-3.2)	-209 (-3.9)	-183 (-3.4)
Dec	---	-199 (-3.8)	-175 (-3.4)	-173 (-3.3)	-150 (-2.9)	-177 (-3.4)	-214 (-4.1)	-189 (-3.6)
Average	---	-59 (-1.1)	-47 (-0.8)	-47 (-0.8)	-41 (-0.7)	-47 (-0.9)	-57 (-1.0)	-52 (-0.9)

Table 223. Monthly Surface Area Wet Year (1997) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,971	5,021	5,134	5,078	4,953	5,060	5,076	5,264
Feb	5,260	5,413	5,519	5,471	5,343	5,456	5,465	5,599
Mar	5,344	5,579	5,673	5,643	5,517	5,639	5,639	5,674
Apr	4,938	5,049	5,168	5,112	4,986	5,106	5,110	5,173
May	4,775	4,738	4,860	4,804	4,685	4,799	4,802	4,877
Jun	5,579	5,448	5,484	5,457	5,418	5,453	5,452	5,523
Jul	5,704	5,699	5,698	5,700	5,700	5,697	5,698	5,705
Aug	5,758	5,744	5,742	5,743	5,746	5,743	5,743	5,743
Sep	5,684	5,649	5,652	5,642	5,645	5,644	5,640	5,641
Oct	5,571	5,290	5,364	5,350	5,334	5,363	5,273	5,287
Nov	5,733	4,994	5,097	5,086	5,070	5,102	4,978	4,990
Dec	5,759	5,254	5,353	5,343	5,333	5,359	5,241	5,253
Average	5,423	5,323	5,395	5,369	5,311	5,368	5,343	5,394
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	113 (2.3)	57 (1.1)	-69 (-1.4)	39 (0.8)	55 (1.1)	243 (4.8)
Feb	---	---	107 (2.0)	58 (1.1)	-70 (-1.3)	43 (0.8)	52 (1.0)	186 (3.4)
Mar	---	---	94 (1.7)	64 (1.1)	-62 (-1.1)	60 (1.1)	60 (1.1)	96 (1.7)
Apr	---	---	119 (2.4)	63 (1.2)	-62 (-1.2)	58 (1.1)	61 (1.2)	124 (2.5)
May	---	---	121 (2.6)	65 (1.4)	-53 (-1.1)	60 (1.3)	64 (1.3)	139 (2.9)
Jun	---	---	35 (0.6)	8 (0.2)	-30 (-0.6)	5 (0.1)	3 (0.1)	74 (1.4)
Jul	---	---	-1 (0.0)	1 (0.0)	1 (0.0)	-2 (0.0)	-1 (0.0)	6 (0.1)
Aug	---	---	-2 (0.0)	-1 (0.0)	2 (0.0)	-2 (0.0)	-2 (0.0)	-2 (0.0)
Sep	---	---	3 (0.1)	-7 (-0.1)	-4 (-0.1)	-5 (-0.1)	-9 (-0.2)	-8 (-0.1)
Oct	---	---	73 (1.4)	60 (1.1)	44 (0.8)	73 (1.4)	-17 (-0.3)	-3 (-0.1)
Nov	---	---	103 (2.1)	91 (1.8)	76 (1.5)	108 (2.2)	-17 (-0.3)	-5 (-0.1)
Dec	---	---	98 (1.9)	89 (1.7)	79 (1.5)	105 (2.0)	-14 (-0.3)	-2 (0.0)
Average	---	---	72 (1.4)	46 (0.9)	-12 (-0.2)	45 (0.8)	20 (0.4)	71 (1.3)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	50 (1.0)	163 (3.3)	107 (2.2)	-19 (-0.4)	89 (1.8)	105 (2.1)	293 (5.9)
Feb	---	152 (2.9)	259 (4.9)	210 (4.0)	82 (1.6)	196 (3.7)	205 (3.9)	338 (6.4)
Mar	---	235 (4.4)	329 (6.2)	299 (5.6)	173 (3.2)	295 (5.5)	295 (5.5)	331 (6.2)
Apr	---	111 (2.2)	230 (4.7)	174 (3.5)	48 (1.0)	168 (3.4)	172 (3.5)	235 (4.8)
May	---	-37 (-0.8)	85 (1.8)	29 (0.6)	-90 (-1.9)	24 (0.5)	27 (0.6)	102 (2.1)
Jun	---	-130 (-2.3)	-95 (-1.7)	-122 (-2.2)	-160 (-2.9)	-125 (-2.2)	-127 (-2.3)	-56 (-1.0)
Jul	---	-5 (-0.1)	-6 (-0.1)	-4 (-0.1)	-4 (-0.1)	-6 (-0.1)	-5 (-0.1)	2 (0.0)
Aug	---	-14 (-0.2)	-16 (-0.3)	-15 (-0.3)	-13 (-0.2)	-16 (-0.3)	-16 (-0.3)	-16 (-0.3)
Sep	---	-35 (-0.6)	-32 (-0.6)	-42 (-0.7)	-39 (-0.7)	-40 (-0.7)	-44 (-0.8)	-43 (-0.8)
Oct	---	-281 (-5.0)	-208 (-3.7)	-221 (-4.0)	-237 (-4.3)	-209 (-3.7)	-299 (-5.4)	-285 (-5.1)
Nov	---	-738 (-12.9)	-636 (-11.1)	-647 (-11.3)	-662 (-11.6)	-631 (-11.0)	-755 (-13.2)	-743 (-13.0)
Dec	---	-505 (-8.8)	-407 (-7.1)	-416 (-7.2)	-426 (-7.4)	-400 (-6.9)	-519 (-9.0)	-507 (-8.8)
Average	---	-100 (-1.8)	-28 (-0.5)	-54 (-1.0)	-112 (-2.1)	-55 (-1.0)	-80 (-1.5)	-29 (-0.5)

Table 224. Monthly Surface Area Dry Year (2004) – Lake Meredith (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,490	4,782	4,848	4,855	4,856	4,852	4,769	4,784
Feb	5,313	5,656	5,726	5,730	5,712	5,726	5,651	5,670
Mar	5,750	5,773	5,773	5,773	5,773	5,774	5,773	5,773
Apr	5,214	5,458	5,476	5,480	5,472	5,476	5,454	5,441
May	5,028	4,933	4,986	4,986	4,957	4,983	4,962	4,928
Jun	4,596	3,537	3,474	3,484	3,560	3,505	3,595	3,455
Jul	4,425	2,464	2,353	2,372	2,518	2,410	2,497	2,326
Aug	4,196	1,904	1,867	1,865	1,899	1,868	1,846	1,860
Sep	4,095	1,914	1,889	1,881	1,909	1,889	1,833	1,874
Oct	3,965	1,691	1,648	1,645	1,732	1,649	1,622	1,676
Nov	3,945	1,861	1,807	1,807	1,867	1,807	1,801	1,851
Dec	4,564	3,313	3,305	3,305	3,324	3,310	3,304	3,313
Average	4,632	3,607	3,596	3,599	3,631	3,604	3,592	3,579
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	66 (1.4)	73 (1.5)	74 (1.5)	70 (1.5)	-12 (-0.3)	2 (0.0)
Feb	---	---	70 (1.2)	74 (1.3)	56 (1.0)	70 (1.2)	-5 (-0.1)	14 (0.2)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	17 (0.3)	22 (0.4)	14 (0.3)	18 (0.3)	-4 (-0.1)	-18 (-0.3)
May	---	---	53 (1.1)	53 (1.1)	24 (0.5)	50 (1.0)	29 (0.6)	-5 (-0.1)
Jun	---	---	-63 (-1.8)	-53 (-1.5)	23 (0.6)	-32 (-0.9)	58 (1.6)	-82 (-2.3)
Jul	---	---	-112 (-4.5)	-92 (-3.7)	54 (2.2)	-54 (-2.2)	33 (1.3)	-138 (-5.6)
Aug	---	---	-37 (-1.9)	-39 (-2.1)	-5 (-0.3)	-36 (-1.9)	-58 (-3.0)	-44 (-2.3)
Sep	---	---	-26 (-1.3)	-33 (-1.7)	-5 (-0.3)	-25 (-1.3)	-82 (-4.3)	-40 (-2.1)
Oct	---	---	-43 (-2.6)	-47 (-2.8)	40 (2.4)	-42 (-2.5)	-69 (-4.1)	-15 (-0.9)
Nov	---	---	-54 (-2.9)	-54 (-2.9)	6 (0.3)	-53 (-2.9)	-59 (-3.2)	-10 (-0.5)
Dec	---	---	-8 (-0.3)	-8 (-0.2)	11 (0.3)	-3 (-0.1)	-9 (-0.3)	0 (0.0)
Average	---	---	-11 (-0.3)	-9 (-0.2)	24 (0.7)	-3 (-0.1)	-15 (-0.4)	-28 (-0.8)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	292 (6.5)	358 (8.0)	365 (8.1)	366 (8.1)	362 (8.1)	280 (6.2)	294 (6.5)
Feb	---	343 (6.5)	413 (7.8)	417 (7.8)	399 (7.5)	413 (7.8)	339 (6.4)	357 (6.7)
Mar	---	23 (0.4)	23 (0.4)	23 (0.4)	23 (0.4)	23 (0.4)	23 (0.4)	23 (0.4)
Apr	---	245 (4.7)	262 (5.0)	266 (5.1)	258 (5.0)	262 (5.0)	240 (4.6)	227 (4.3)
May	---	-95 (-1.9)	-42 (-0.8)	-42 (-0.8)	-71 (-1.4)	-45 (-0.9)	-66 (-1.3)	-100 (-2.0)
Jun	---	-1059 (-23.0)	-1122 (-24.4)	-1112 (-24.2)	-1036 (-22.5)	-1091 (-23.7)	-1001 (-21.8)	-1141 (-24.8)
Jul	---	-1960 (-44.3)	-2072 (-46.8)	-2053 (-46.4)	-1907 (-43.1)	-2014 (-45.5)	-1927 (-43.6)	-2098 (-47.4)
Aug	---	-2291 (-54.6)	-2328 (-55.5)	-2331 (-55.5)	-2296 (-54.7)	-2328 (-55.5)	-2349 (-56.0)	-2335 (-55.7)
Sep	---	-2181 (-53.3)	-2206 (-53.9)	-2213 (-54.1)	-2186 (-53.4)	-2206 (-53.9)	-2262 (-55.2)	-2221 (-54.2)
Oct	---	-2274 (-57.3)	-2317 (-58.4)	-2321 (-58.5)	-2233 (-56.3)	-2316 (-58.4)	-2343 (-59.1)	-2289 (-57.7)
Nov	---	-2084 (-52.8)	-2138 (-54.2)	-2138 (-54.2)	-2078 (-52.7)	-2137 (-54.2)	-2143 (-54.3)	-2094 (-53.1)
Dec	---	-1252 (-27.4)	-1260 (-27.6)	-1259 (-27.6)	-1241 (-27.2)	-1255 (-27.5)	-1260 (-27.6)	-1251 (-27.4)
Average	---	-1024 (-22.1)	-1036 (-22.4)	-1033 (-22.3)	-1000 (-21.6)	-1028 (-22.2)	-1039 (-22.4)	-1052 (-22.7)

Lake Henry

Mean monthly direct effects analysis storage contents for Lake Henry are presented in Table 225 through Table 228 while the cumulative effects are shown in Table 229 through Table 232. Effects are similar to those seen at Lake Meredith.

Table 225. Monthly Storage Contents Overall Average – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Contents (ac-ft)															
Jan	7,700	8,000		7,700		7,800		8,200		7,700		7,700		7,700	
Feb	8,200	8,400		8,300		8,300		8,600		8,300		8,200		8,200	
Mar	8,700	8,900		8,800		8,900		9,000		8,800		8,800		8,800	
Apr	8,500	8,700		8,600		8,600		8,800		8,600		8,600		8,600	
May	8,500	8,600		8,500		8,500		8,700		8,500		8,500		8,500	
Jun	9,100	9,200		9,100		9,100		9,200		9,100		9,100		9,100	
Jul	8,900	8,900		8,900		8,900		8,900		8,900		8,900		8,900	
Aug	8,200	8,300		8,200		8,300		8,400		8,200		8,200		8,200	
Sep	8,000	8,100		8,000		8,100		8,200		8,000		8,000		8,000	
Oct	7,800	8,000		7,800		7,800		8,200		7,800		7,800		7,800	
Nov	7,900	8,100		7,700		7,700		8,300		7,700		7,700		7,700	
Dec	7,700	8,000		7,700		7,700		8,200		7,700		7,600		7,600	
Average	8,300	8,400		8,300		8,300		8,500		8,300		8,300		8,300	
Change in Contents Compared to No Action [ac-ft (%)]															
Jan	---	---		-300	(-3.8)	-200	(-2.5)	200	(2.5)	-300	(-3.8)	-300	(-3.8)	-300	(-3.8)
Feb	---	---		-100	(-1.2)	-100	(-1.2)	200	(2.4)	-100	(-1.2)	-200	(-2.4)	-200	(-2.4)
Mar	---	---		-100	(-1.1)	0	(0.0)	100	(1.1)	-100	(-1.1)	-100	(-1.1)	-100	(-1.1)
Apr	---	---		-100	(-1.1)	-100	(-1.1)	100	(1.1)	-100	(-1.1)	-100	(-1.1)	-100	(-1.1)
May	---	---		-100	(-1.2)	-100	(-1.2)	100	(1.2)	-100	(-1.2)	-100	(-1.2)	-100	(-1.2)
Jun	---	---		-100	(-1.1)	-100	(-1.1)	0	(0.0)	-100	(-1.1)	-100	(-1.1)	-100	(-1.1)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		-100	(-1.2)	0	(0.0)	100	(1.2)	-100	(-1.2)	-100	(-1.2)	-100	(-1.2)
Sep	---	---		-100	(-1.2)	0	(0.0)	100	(1.2)	-100	(-1.2)	-100	(-1.2)	-100	(-1.2)
Oct	---	---		-200	(-2.5)	-200	(-2.5)	200	(2.5)	-200	(-2.5)	-200	(-2.5)	-200	(-2.5)
Nov	---	---		-400	(-4.9)	-400	(-4.9)	200	(2.5)	-400	(-4.9)	-400	(-4.9)	-400	(-4.9)
Dec	---	---		-300	(-3.8)	-300	(-3.8)	200	(2.5)	-300	(-3.8)	-400	(-5.0)	-400	(-5.0)
Average	---	---		-100	(-1.2)	-100	(-1.2)	100	(1.2)	-100	(-1.2)	-100	(-1.2)	-100	(-1.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]															
Jan	---	300	(3.9)	0	(0.0)	100	(1.3)	500	(6.5)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	200	(2.4)	100	(1.2)	100	(1.2)	400	(4.9)	100	(1.2)	0	(0.0)	0	(0.0)
Mar	---	200	(2.3)	100	(1.1)	200	(2.3)	300	(3.4)	100	(1.1)	100	(1.1)	100	(1.1)
Apr	---	200	(2.4)	100	(1.2)	100	(1.2)	300	(3.5)	100	(1.2)	100	(1.2)	100	(1.2)
May	---	100	(1.2)	0	(0.0)	0	(0.0)	200	(2.4)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	100	(1.1)	0	(0.0)	0	(0.0)	100	(1.1)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	100	(1.2)	0	(0.0)	100	(1.2)	200	(2.4)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	100	(1.3)	0	(0.0)	100	(1.3)	200	(2.5)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	200	(2.6)	0	(0.0)	0	(0.0)	400	(5.1)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---	200	(2.5)	-200	(-2.5)	-200	(-2.5)	400	(5.1)	-200	(-2.5)	-200	(-2.5)	-200	(-2.5)
Dec	---	300	(3.9)	0	(0.0)	0	(0.0)	500	(6.5)	0	(0.0)	-100	(-1.3)	-100	(-1.3)
Average	---	100	(1.2)	0	(0.0)	0	(0.0)	200	(2.4)	0	(0.0)	0	(0.0)	0	(0.0)

Table 226. Monthly Storage Contents Normal Year (2005) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	7,600	7,300	6,800	6,800	7,200	6,800	6,900	6,900
Feb	10,100	10,000	9,900	10,000	10,000	10,000	10,000	10,000
Mar	9,200	9,300	9,400	9,400	9,300	9,400	9,400	9,400
Apr	8,400	8,600	8,800	8,800	8,700	8,800	8,800	8,700
May	8,700	8,900	8,900	8,900	8,900	8,900	8,900	8,900
Jun	9,800	9,700	9,800	9,800	9,800	9,800	9,800	9,800
Jul	9,900	9,900	9,900	9,900	9,900	9,900	9,900	9,900
Aug	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800
Sep	9,200	9,200	9,200	9,200	9,200	9,200	9,200	9,200
Oct	8,100	8,100	8,100	8,000	8,200	8,000	8,100	7,900
Nov	7,300	7,400	7,200	7,200	7,500	7,200	7,200	7,000
Dec	7,000	7,000	6,800	6,800	7,100	6,800	6,900	6,700
Average	8,700	8,800	8,700	8,700	8,800	8,700	8,700	8,700
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-500 (-6.8)	-500 (-6.8)	-100 (-1.4)	-500 (-6.8)	-400 (-5.5)	-400 (-5.5)
Feb	---	---	-100 (-1.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	100 (1.1)	100 (1.1)	0 (0.0)	100 (1.1)	100 (1.1)	100 (1.1)
Apr	---	---	200 (2.3)	200 (2.3)	100 (1.2)	200 (2.3)	200 (2.3)	100 (1.2)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	100 (1.0)	100 (1.0)	100 (1.0)	100 (1.0)	100 (1.0)	100 (1.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	-100 (-1.2)	100 (1.2)	-100 (-1.2)	0 (0.0)	-200 (-2.5)
Nov	---	---	-200 (-2.7)	-200 (-2.7)	100 (1.4)	-200 (-2.7)	-200 (-2.7)	-400 (-5.4)
Dec	---	---	-200 (-2.9)	-200 (-2.9)	100 (1.4)	-200 (-2.9)	-100 (-1.4)	-300 (-4.3)
Average	---	---	-100 (-1.1)	-100 (-1.1)	0 (0.0)	-100 (-1.1)	-100 (-1.1)	-100 (-1.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-300 (-3.9)	-800 (-10.5)	-800 (-10.5)	-400 (-5.3)	-800 (-10.5)	-700 (-9.2)	-700 (-9.2)
Feb	---	-100 (-1.0)	-200 (-2.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)
Mar	---	100 (1.1)	200 (2.2)	200 (2.2)	100 (1.1)	200 (2.2)	200 (2.2)	200 (2.2)
Apr	---	200 (2.4)	400 (4.8)	400 (4.8)	300 (3.6)	400 (4.8)	400 (4.8)	300 (3.6)
May	---	200 (2.3)	200 (2.3)	200 (2.3)	200 (2.3)	200 (2.3)	200 (2.3)	200 (2.3)
Jun	---	-100 (-1.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	-100 (-1.2)	100 (1.2)	-100 (-1.2)	0 (0.0)	-200 (-2.5)
Nov	---	100 (1.4)	-100 (-1.4)	-100 (-1.4)	200 (2.7)	-100 (-1.4)	-100 (-1.4)	-300 (-4.1)
Dec	---	0 (0.0)	-200 (-2.9)	-200 (-2.9)	100 (1.4)	-200 (-2.9)	-100 (-1.4)	-300 (-4.3)
Average	---	100 (1.1)	0 (0.0)	0 (0.0)	100 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)

Table 227. Monthly Storage Contents Wet Year (1997) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Contents (ac-ft)															
Jan	8,300	8,300		8,400		8,400		8,400		8,400		8,400		8,300	
Feb	8,100	8,100		8,400		8,400		8,300		8,400		8,300		8,200	
Mar	7,500	7,500		7,900		7,900		7,800		7,900		7,700		7,700	
Apr	6,500	6,500		6,800		6,900		6,700		6,800		6,700		6,600	
May	8,400	8,300		8,600		8,500		8,700		8,600		8,500		8,400	
Jun	9,900	9,900		9,900		9,900		9,900		9,900		9,900		9,900	
Jul	9,600	9,600		9,600		9,600		9,600		9,600		9,600		9,600	
Aug	9,900	9,900		9,900		9,900		9,900		9,900		9,900		9,900	
Sep	8,700	8,900		8,800		8,800		8,900		8,800		8,800		8,800	
Oct	8,700	9,100		9,000		9,000		9,200		9,000		9,000		9,000	
Nov	9,800	9,800		9,800		9,800		9,800		9,800		9,800		9,800	
Dec	9,600	9,600		9,600		9,600		9,600		9,600		9,600		9,600	
Average	8,800	8,800		8,900		8,900		8,900		8,900		8,800		8,800	
Change in Contents Compared to No Action [ac-ft (%)]															
Jan	---	---		100	(1.2)	100	(1.2)	100	(1.2)	100	(1.2)	100	(1.2)	0	(0.0)
Feb	---	---		300	(3.7)	300	(3.7)	200	(2.5)	300	(3.7)	200	(2.5)	100	(1.2)
Mar	---	---		400	(5.3)	400	(5.3)	300	(4.0)	400	(5.3)	200	(2.7)	200	(2.7)
Apr	---	---		300	(4.6)	400	(6.2)	200	(3.1)	300	(4.6)	200	(3.1)	100	(1.5)
May	---	---		300	(3.6)	200	(2.4)	400	(4.8)	300	(3.6)	200	(2.4)	100	(1.2)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---		-100	(-1.1)	-100	(-1.1)	0	(0.0)	-100	(-1.1)	-100	(-1.1)	-100	(-1.1)
Oct	---	---		-100	(-1.1)	-100	(-1.1)	100	(1.1)	-100	(-1.1)	-100	(-1.1)	-100	(-1.1)
Nov	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		100	(1.1)	100	(1.1)	100	(1.1)	100	(1.1)	0	(0.0)	0	(0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]															
Jan	---	0	(0.0)	100	(1.2)	100	(1.2)	100	(1.2)	100	(1.2)	100	(1.2)	0	(0.0)
Feb	---	0	(0.0)	300	(3.7)	300	(3.7)	200	(2.5)	300	(3.7)	200	(2.5)	100	(1.2)
Mar	---	0	(0.0)	400	(5.3)	400	(5.3)	300	(4.0)	400	(5.3)	200	(2.7)	200	(2.7)
Apr	---	0	(0.0)	300	(4.6)	400	(6.2)	200	(3.1)	300	(4.6)	200	(3.1)	100	(1.5)
May	---	-100	(-1.2)	200	(2.4)	100	(1.2)	300	(3.6)	200	(2.4)	100	(1.2)	0	(0.0)
Jun	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	200	(2.3)	100	(1.1)	100	(1.1)	200	(2.3)	100	(1.1)	100	(1.1)	100	(1.1)
Oct	---	400	(4.6)	300	(3.4)	300	(3.4)	500	(5.7)	300	(3.4)	300	(3.4)	300	(3.4)
Nov	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	0	(0.0)	100	(1.1)	100	(1.1)	100	(1.1)	100	(1.1)	0	(0.0)	0	(0.0)

Table 228. Monthly Storage Contents Dry Year (2004) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	4,800	5,100	7,000	7,000	6,900	7,000	6,000	6,400
Feb	5,300	5,700	7,800	7,800	7,500	7,800	6,700	7,100
Mar	8,200	8,500	9,000	9,000	9,000	9,000	8,800	9,000
Apr	8,600	8,600	8,600	8,600	8,700	8,600	8,600	8,600
May	9,600	9,600	9,500	9,500	9,500	9,500	9,500	9,600
Jun	9,300	9,100	9,100	9,200	8,500	9,100	9,300	9,200
Jul	9,500	9,500	9,400	9,500	9,400	9,400	9,500	9,500
Aug	8,900	8,900	8,900	8,900	8,900	8,900	8,900	8,800
Sep	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,200
Oct	7,900	7,800	7,700	7,700	7,800	7,700	7,700	7,700
Nov	7,400	7,500	7,100	7,100	7,500	7,100	7,100	7,100
Dec	7,000	7,100	6,700	6,700	7,100	6,700	6,700	6,700
Average	8,000	8,100	8,300	8,300	8,300	8,300	8,200	8,200
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,900 (37.3)	1,900 (37.3)	1,800 (35.3)	1,900 (37.3)	900 (17.6)	1,300 (25.5)
Feb	---	---	2,100 (36.8)	2,100 (36.8)	1,800 (31.6)	2,100 (36.8)	1,000 (17.5)	1,400 (24.6)
Mar	---	---	500 (5.9)	500 (5.9)	500 (5.9)	500 (5.9)	300 (3.5)	500 (5.9)
Apr	---	---	0 (0.0)	0 (0.0)	100 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	0 (0.0)
Jun	---	---	0 (0.0)	100 (1.1)	-600 (-6.6)	0 (0.0)	200 (2.2)	100 (1.1)
Jul	---	---	-100 (-1.1)	0 (0.0)	-100 (-1.1)	-100 (-1.1)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-1.1)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-1.1)
Oct	---	---	-100 (-1.3)	-100 (-1.3)	0 (0.0)	-100 (-1.3)	-100 (-1.3)	-100 (-1.3)
Nov	---	---	-400 (-5.3)	-400 (-5.3)	0 (0.0)	-400 (-5.3)	-400 (-5.3)	-400 (-5.3)
Dec	---	---	-400 (-5.6)	-400 (-5.6)	0 (0.0)	-400 (-5.6)	-400 (-5.6)	-400 (-5.6)
Average	---	---	200 (2.5)	200 (2.5)	200 (2.5)	200 (2.5)	100 (1.2)	100 (1.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	---	300 (6.3)	2,200 (45.8)	2,200 (45.8)	2,100 (43.8)	2,200 (45.8)	1,200 (25.0)
Feb	---	---	400 (7.5)	2,500 (47.2)	2,500 (47.2)	2,200 (41.5)	2,500 (47.2)	1,400 (26.4)
Mar	---	---	300 (3.7)	800 (9.8)	800 (9.8)	800 (9.8)	800 (9.8)	600 (7.3)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	100 (1.2)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)
Jun	---	---	-200 (-2.2)	-200 (-2.2)	-100 (-1.1)	-800 (-8.6)	-200 (-2.2)	0 (0.0)
Jul	---	---	0 (0.0)	-100 (-1.1)	0 (0.0)	-100 (-1.1)	-100 (-1.1)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	-100 (-1.3)	-200 (-2.5)	-200 (-2.5)	-100 (-1.3)	-200 (-2.5)	-200 (-2.5)
Nov	---	---	100 (1.4)	-300 (-4.1)	-300 (-4.1)	100 (1.4)	-300 (-4.1)	-300 (-4.1)
Dec	---	---	100 (1.4)	-300 (-4.3)	-300 (-4.3)	100 (1.4)	-300 (-4.3)	-300 (-4.3)
Average	---	---	100 (1.3)	300 (3.8)	300 (3.8)	300 (3.8)	300 (3.8)	200 (2.5)

Table 229. Monthly Storage Contents Overall Average – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	7,700	5,000	5,100	5,000	5,200	5,100	4,900	4,800
Feb	8,200	5,900	6,100	6,000	6,200	6,100	5,800	5,800
Mar	8,700	7,100	7,200	7,000	7,100	7,100	6,900	7,000
Apr	8,500	7,100	7,200	7,100	7,100	7,200	7,000	7,100
May	8,500	6,700	6,800	6,800	6,900	6,800	6,700	6,600
Jun	9,100	7,100	7,000	7,000	7,200	7,000	7,000	6,900
Jul	8,900	7,000	7,000	7,000	7,200	7,000	6,900	6,900
Aug	8,200	6,000	6,200	6,100	6,100	6,200	6,100	6,000
Sep	8,000	5,200	5,300	5,200	5,300	5,300	5,300	5,200
Oct	7,800	4,400	4,500	4,500	4,500	4,500	4,300	4,200
Nov	7,900	4,400	4,400	4,400	4,600	4,400	4,200	4,100
Dec	7,700	4,700	4,700	4,700	4,900	4,700	4,600	4,400
Average	8,300	5,900	6,000	5,900	6,000	5,900	5,800	5,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (2.0)	0 (0.0)	200 (4.0)	100 (2.0)	-100 (-2.0)	-200 (-4.0)
Feb	---	---	200 (3.4)	100 (1.7)	300 (5.1)	200 (3.4)	-100 (-1.7)	-100 (-1.7)
Mar	---	---	100 (1.4)	-100 (-1.4)	0 (0.0)	0 (0.0)	-200 (-2.8)	-100 (-1.4)
Apr	---	---	100 (1.4)	0 (0.0)	0 (0.0)	100 (1.4)	-100 (-1.4)	0 (0.0)
May	---	---	100 (1.5)	100 (1.5)	200 (3.0)	100 (1.5)	0 (0.0)	-100 (-1.5)
Jun	---	---	-100 (-1.4)	-100 (-1.4)	100 (1.4)	-100 (-1.4)	-100 (-1.4)	-200 (-2.8)
Jul	---	---	0 (0.0)	0 (0.0)	200 (2.9)	0 (0.0)	-100 (-1.4)	-100 (-1.4)
Aug	---	---	200 (3.3)	100 (1.7)	100 (1.7)	200 (3.3)	100 (1.7)	0 (0.0)
Sep	---	---	100 (1.9)	0 (0.0)	100 (1.9)	100 (1.9)	100 (1.9)	0 (0.0)
Oct	---	---	100 (2.3)	100 (2.3)	100 (2.3)	100 (2.3)	-100 (-2.3)	-200 (-4.5)
Nov	---	---	0 (0.0)	0 (0.0)	200 (4.5)	0 (0.0)	-200 (-4.5)	-300 (-6.8)
Dec	---	---	0 (0.0)	0 (0.0)	200 (4.3)	0 (0.0)	-100 (-2.1)	-300 (-6.4)
Average	---	---	100 (1.7)	0 (0.0)	100 (1.7)	0 (0.0)	-100 (-1.7)	-100 (-1.7)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-2,700 (-35.1)	-2,600 (-33.8)	-2,700 (-35.1)	-2,500 (-32.5)	-2,600 (-33.8)	-2,800 (-36.4)	-2,900 (-37.7)
Feb	---	-2,300 (-28.0)	-2,100 (-25.6)	-2,200 (-26.8)	-2,000 (-24.4)	-2,100 (-25.6)	-2,400 (-29.3)	-2,400 (-29.3)
Mar	---	-1,600 (-18.4)	-1,500 (-17.2)	-1,700 (-19.5)	-1,600 (-18.4)	-1,600 (-18.4)	-1,800 (-20.7)	-1,700 (-19.5)
Apr	---	-1,400 (-16.5)	-1,300 (-15.3)	-1,400 (-16.5)	-1,400 (-16.5)	-1,300 (-15.3)	-1,500 (-17.6)	-1,400 (-16.5)
May	---	-1,800 (-21.2)	-1,700 (-20.0)	-1,700 (-20.0)	-1,600 (-18.8)	-1,700 (-20.0)	-1,800 (-21.2)	-1,900 (-22.4)
Jun	---	-2,000 (-22.0)	-2,100 (-23.1)	-2,100 (-23.1)	-1,900 (-20.9)	-2,100 (-23.1)	-2,100 (-23.1)	-2,200 (-24.2)
Jul	---	-1,900 (-21.3)	-1,900 (-21.3)	-1,900 (-21.3)	-1,700 (-19.1)	-1,900 (-21.3)	-2,000 (-22.5)	-2,000 (-22.5)
Aug	---	-2,200 (-26.8)	-2,000 (-24.4)	-2,100 (-25.6)	-2,100 (-25.6)	-2,000 (-24.4)	-2,100 (-25.6)	-2,200 (-26.8)
Sep	---	-2,800 (-35.0)	-2,700 (-33.8)	-2,800 (-35.0)	-2,700 (-33.8)	-2,700 (-33.8)	-2,700 (-33.8)	-2,800 (-35.0)
Oct	---	-3,400 (-43.6)	-3,300 (-42.3)	-3,300 (-42.3)	-3,300 (-42.3)	-3,300 (-42.3)	-3,500 (-44.9)	-3,600 (-46.2)
Nov	---	-3,500 (-44.3)	-3,500 (-44.3)	-3,500 (-44.3)	-3,300 (-41.8)	-3,500 (-44.3)	-3,700 (-46.8)	-3,800 (-48.1)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Dec	---	-3,000 (-39.0)	-3,000 (-39.0)	-3,000 (-39.0)	-2,800 (-36.4)	-3,000 (-39.0)	-3,100 (-40.3)	-3,300 (-42.9)
Average	---	-2,400 (-28.9)	-2,300 (-27.7)	-2,400 (-28.9)	-2,300 (-27.7)	-2,400 (-28.9)	-2,500 (-30.1)	-2,500 (-30.1)

Table 230. Monthly Storage Contents Normal Year (2005) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	7,600	1,400	1,300	1,300	1,400	1,300	1,300	1,300
Feb	10,100	4,800	5,600	5,600	5,600	5,600	4,800	4,900
Mar	9,200	9,900	9,800	9,900	9,900	9,900	10,000	9,900
Apr	8,400	9,600	9,500	9,800	9,700	9,700	9,700	9,500
May	8,700	9,000	9,100	9,200	9,200	9,200	9,100	9,000
Jun	9,800	9,300	9,300	9,300	9,300	9,300	9,500	9,300
Jul	9,900	9,800	9,600	9,600	9,600	9,600	9,700	9,700
Aug	9,800	9,700	9,900	9,900	9,900	9,900	9,800	9,800
Sep	9,200	8,700	8,800	8,800	8,800	8,800	8,800	8,800
Oct	8,100	6,500	6,800	6,800	6,700	6,800	6,700	6,500
Nov	7,300	3,100	3,400	3,400	3,300	3,300	3,100	3,000
Dec	7,000	2,300	2,700	2,700	2,600	2,600	2,400	2,300
Average	8,700	7,000	7,200	7,200	7,200	7,200	7,100	7,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-100 (-7.1)	-100 (-7.1)	0 (0.0)	-100 (-7.1)	-100 (-7.1)	-100 (-7.1)
Feb	---	---	800 (16.7)	800 (16.7)	800 (16.7)	800 (16.7)	0 (0.0)	100 (2.1)
Mar	---	---	-100 (-1.0)	0 (0.0)	0 (0.0)	0 (0.0)	100 (1.0)	0 (0.0)
Apr	---	---	-100 (-1.0)	200 (2.1)	100 (1.0)	100 (1.0)	100 (1.0)	-100 (-1.0)
May	---	---	100 (1.1)	200 (2.2)	200 (2.2)	200 (2.2)	100 (1.1)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	200 (2.2)	0 (0.0)
Jul	---	---	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-100 (-1.0)	-100 (-1.0)
Aug	---	---	200 (2.1)	200 (2.1)	200 (2.1)	200 (2.1)	100 (1.0)	100 (1.0)
Sep	---	---	100 (1.1)	100 (1.1)	100 (1.1)	100 (1.1)	100 (1.1)	100 (1.1)
Oct	---	---	300 (4.6)	300 (4.6)	200 (3.1)	300 (4.6)	200 (3.1)	0 (0.0)
Nov	---	---	300 (9.7)	300 (9.7)	200 (6.5)	200 (6.5)	0 (0.0)	-100 (-3.2)
Dec	---	---	400 (17.4)	400 (17.4)	300 (13.0)	300 (13.0)	100 (4.3)	0 (0.0)
Average	---	---	200 (2.9)	200 (2.9)	200 (2.9)	200 (2.9)	100 (1.4)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-6,200 (-81.6)	-6,300 (-82.9)	-6,300 (-82.9)	-6,200 (-81.6)	-6,300 (-82.9)	-6,300 (-82.9)	-6,300 (-82.9)
Feb	---	-5,300 (-52.5)	-4,500 (-44.6)	-4,500 (-44.6)	-4,500 (-44.6)	-4,500 (-44.6)	-5,300 (-52.5)	-5,200 (-51.5)
Mar	---	700 (7.6)	600 (6.5)	700 (7.6)	700 (7.6)	700 (7.6)	800 (8.7)	700 (7.6)
Apr	---	1,200 (14.3)	1,100 (13.1)	1,400 (16.7)	1,300 (15.5)	1,300 (15.5)	1,300 (15.5)	1,100 (13.1)
May	---	300 (3.4)	400 (4.6)	500 (5.7)	500 (5.7)	500 (5.7)	400 (4.6)	300 (3.4)
Jun	---	-500 (-5.1)	-500 (-5.1)	-500 (-5.1)	-500 (-5.1)	-500 (-5.1)	-300 (-3.1)	-500 (-5.1)
Jul	---	-100 (-1.0)	-300 (-3.0)	-300 (-3.0)	-300 (-3.0)	-300 (-3.0)	-200 (-2.0)	-200 (-2.0)
Aug	---	-100 (-1.0)	100 (1.0)	100 (1.0)	100 (1.0)	100 (1.0)	0 (0.0)	0 (0.0)
Sep	---	-500 (-5.4)	-400 (-4.3)	-400 (-4.3)	-400 (-4.3)	-400 (-4.3)	-400 (-4.3)	-400 (-4.3)
Oct	---	-1,600 (-19.8)	-1,300 (-16.0)	-1,300 (-16.0)	-1,400 (-17.3)	-1,300 (-16.0)	-1,400 (-17.3)	-1,600 (-19.8)
Nov	---	-4,200 (-57.5)	-3,900 (-53.4)	-3,900 (-53.4)	-4,000 (-54.8)	-4,000 (-54.8)	-4,200 (-57.5)	-4,300 (-58.9)
Dec	---	-4,700 (-67.1)	-4,300 (-61.4)	-4,300 (-61.4)	-4,400 (-62.9)	-4,400 (-62.9)	-4,600 (-65.7)	-4,700 (-67.1)
Average	---	-1,700 (-19.5)	-1,500 (-17.2)	-1,500 (-17.2)	-1,500 (-17.2)	-1,500 (-17.2)	-1,600 (-18.4)	-1,700 (-19.5)

Table 231. Monthly Storage Contents Wet Year (1997) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	8,300	8,000	7,700	7,700	7,400	7,700	7,800	7,800
Feb	8,100	7,800	7,500	7,500	7,200	7,500	7,600	7,700
Mar	7,500	6,900	6,700	6,700	6,300	6,700	6,700	7,800
Apr	6,500	5,300	5,300	5,200	4,700	5,200	5,200	6,400
May	8,400	7,300	7,200	7,100	6,800	7,100	7,100	8,100
Jun	9,900	9,800	9,800	9,800	9,800	9,800	9,800	9,900
Jul	9,600	9,200	9,100	9,100	9,200	9,100	9,100	9,100
Aug	9,900	9,700	9,700	9,700	9,700	9,700	9,700	9,700
Sep	8,700	4,100	4,500	4,600	4,300	4,700	4,200	4,200
Oct	8,700	1,800	1,800	1,800	1,900	1,900	1,700	1,800
Nov	9,800	5,300	4,600	4,700	5,300	4,700	5,000	5,000
Dec	9,600	6,900	6,200	6,300	6,900	6,300	6,600	6,600
Average	8,800	6,800	6,700	6,700	6,600	6,700	6,700	7,000
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	-300 (-3.8)	-300 (-3.8)	-600 (-7.5)	-300 (-3.8)	-200 (-2.5)	-200 (-2.5)
Feb	---	---	-300 (-3.8)	-300 (-3.8)	-600 (-7.7)	-300 (-3.8)	-200 (-2.6)	-100 (-1.3)
Mar	---	---	-200 (-2.9)	-200 (-2.9)	-600 (-8.7)	-200 (-2.9)	-200 (-2.9)	900 (13.0)
Apr	---	---	0 (0.0)	-100 (-1.9)	-600 (-11.3)	-100 (-1.9)	-100 (-1.9)	1,100 (20.8)
May	---	---	-100 (-1.4)	-200 (-2.7)	-500 (-6.8)	-200 (-2.7)	-200 (-2.7)	800 (11.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	100 (1.0)
Jul	---	---	-100 (-1.1)	-100 (-1.1)	0 (0.0)	-100 (-1.1)	-100 (-1.1)	-100 (-1.1)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	400 (9.8)	500 (12.2)	200 (4.9)	600 (14.6)	100 (2.4)	100 (2.4)
Oct	---	---	0 (0.0)	0 (0.0)	100 (5.6)	100 (5.6)	-100 (-5.6)	0 (0.0)
Nov	---	---	-700 (-13.2)	-600 (-11.3)	0 (0.0)	-600 (-11.3)	-300 (-5.7)	-300 (-5.7)
Dec	---	---	-700 (-10.1)	-600 (-8.7)	0 (0.0)	-600 (-8.7)	-300 (-4.3)	-300 (-4.3)
Average	---	---	-100 (-1.5)	-100 (-1.5)	-200 (-2.9)	-100 (-1.5)	-100 (-1.5)	200 (2.9)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-300 (-3.6)	-600 (-7.2)	-600 (-7.2)	-900 (-10.8)	-600 (-7.2)	-500 (-6.0)	-500 (-6.0)
Feb	---	-300 (-3.7)	-600 (-7.4)	-600 (-7.4)	-900 (-11.1)	-600 (-7.4)	-500 (-6.2)	-400 (-4.9)
Mar	---	-600 (-8.0)	-800 (-10.7)	-800 (-10.7)	-1,200 (-16.0)	-800 (-10.7)	-800 (-10.7)	300 (4.0)
Apr	---	-1,200 (-18.5)	-1,200 (-18.5)	-1,300 (-20.0)	-1,800 (-27.7)	-1,300 (-20.0)	-1,300 (-20.0)	-100 (-1.5)
May	---	-1,100 (-13.1)	-1,200 (-14.3)	-1,300 (-15.5)	-1,600 (-19.0)	-1,300 (-15.5)	-1,300 (-15.5)	-300 (-3.6)
Jun	---	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	-100 (-1.0)	0 (0.0)
Jul	---	-400 (-4.2)	-500 (-5.2)	-500 (-5.2)	-400 (-4.2)	-500 (-5.2)	-500 (-5.2)	-500 (-5.2)
Aug	---	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)	-200 (-2.0)
Sep	---	-4,600 (-52.9)	-4,200 (-48.3)	-4,100 (-47.1)	-4,400 (-50.6)	-4,000 (-46.0)	-4,500 (-51.7)	-4,500 (-51.7)
Oct	---	-6,900 (-79.3)	-6,900 (-79.3)	-6,900 (-79.3)	-6,800 (-78.2)	-6,800 (-78.2)	-7,000 (-80.5)	-6,900 (-79.3)
Nov	---	-4,500 (-45.9)	-5,200 (-53.1)	-5,100 (-52.0)	-4,500 (-45.9)	-5,100 (-52.0)	-4,800 (-49.0)	-4,800 (-49.0)
Dec	---	-2,700 (-28.1)	-3,400 (-35.4)	-3,300 (-34.4)	-2,700 (-28.1)	-3,300 (-34.4)	-3,000 (-31.3)	-3,000 (-31.3)
Average	---	-2,000 (-22.7)	-2,100 (-23.9)	-2,100 (-23.9)	-2,200 (-25.0)	-2,100 (-23.9)	-2,100 (-23.9)	-1,800 (-20.5)

Table 232. Monthly Storage Contents Dry Year (2004) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	4,800	6,300	7,300	7,400	6,900	7,300	6,200	6,400
Feb	5,300	9,100	9,300	9,300	9,300	9,300	9,100	9,100
Mar	8,200	9,800	9,800	9,800	9,800	9,700	9,800	9,700
Apr	8,600	9,400	9,400	9,400	9,400	9,400	9,400	9,300
May	9,600	5,500	5,600	5,600	5,700	5,700	5,500	5,500
Jun	9,300	2,500	2,500	2,500	2,600	2,500	2,500	2,500
Jul	9,500	6,000	5,800	5,800	5,900	5,600	5,000	5,600
Aug	8,900	3,600	3,500	3,400	4,200	3,400	3,000	3,200
Sep	9,300	2,400	2,500	2,400	3,100	2,400	2,200	2,300
Oct	7,900	1,400	1,400	1,400	1,500	1,400	1,300	1,400
Nov	7,400	1,300	1,200	1,200	1,400	1,200	1,200	1,300
Dec	7,000	1,300	1,200	1,200	1,300	1,200	1,200	1,200
Average	8,000	4,900	4,900	4,900	5,100	4,900	4,700	4,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,000 (15.9)	1,100 (17.5)	600 (9.5)	1,000 (15.9)	-100 (-1.6)	100 (1.6)
Feb	---	---	200 (2.2)	200 (2.2)	200 (2.2)	200 (2.2)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-1.0)	0 (0.0)	-100 (-1.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-1.1)
May	---	---	100 (1.8)	100 (1.8)	200 (3.6)	200 (3.6)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	100 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	-200 (-3.3)	-200 (-3.3)	-100 (-1.7)	-400 (-6.7)	-1,000 (-16.7)	-400 (-6.7)
Aug	---	---	-100 (-2.8)	-200 (-5.6)	600 (16.7)	-200 (-5.6)	-600 (-16.7)	-400 (-11.1)
Sep	---	---	100 (4.2)	0 (0.0)	700 (29.2)	0 (0.0)	-200 (-8.3)	-100 (-4.2)
Oct	---	---	0 (0.0)	0 (0.0)	100 (7.1)	0 (0.0)	-100 (-7.1)	0 (0.0)
Nov	---	---	-100 (-7.7)	-100 (-7.7)	100 (7.7)	-100 (-7.7)	-100 (-7.7)	0 (0.0)
Dec	---	---	-100 (-7.7)	-100 (-7.7)	0 (0.0)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)
Average	---	---	0 (0.0)	0 (0.0)	200 (4.1)	0 (0.0)	-200 (-4.1)	-100 (-2.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	1,500 (31.3)	2,500 (52.1)	2,600 (54.2)	2,100 (43.8)	2,500 (52.1)	1,400 (29.2)	1,600 (33.3)
Feb	---	3,800 (71.7)	4,000 (75.5)	4,000 (75.5)	4,000 (75.5)	4,000 (75.5)	3,800 (71.7)	3,800 (71.7)
Mar	---	1,600 (19.5)	1,600 (19.5)	1,600 (19.5)	1,600 (19.5)	1,500 (18.3)	1,600 (19.5)	1,500 (18.3)
Apr	---	800 (9.3)	800 (9.3)	800 (9.3)	800 (9.3)	800 (9.3)	800 (9.3)	700 (8.1)
May	---	-4,100 (-42.7)	-4,000 (-41.7)	-4,000 (-41.7)	-3,900 (-40.6)	-3,900 (-40.6)	-4,100 (-42.7)	-4,100 (-42.7)
Jun	---	-6,800 (-73.1)	-6,800 (-73.1)	-6,800 (-73.1)	-6,700 (-72.0)	-6,800 (-73.1)	-6,800 (-73.1)	-6,800 (-73.1)
Jul	---	-3,500 (-36.8)	-3,700 (-38.9)	-3,700 (-38.9)	-3,600 (-37.9)	-3,900 (-41.1)	-4,500 (-47.4)	-3,900 (-41.1)
Aug	---	-5,300 (-59.6)	-5,400 (-60.7)	-5,500 (-61.8)	-4,700 (-52.8)	-5,500 (-61.8)	-5,900 (-66.3)	-5,700 (-64.0)
Sep	---	-6,900 (-74.2)	-6,800 (-73.1)	-6,900 (-74.2)	-6,200 (-66.7)	-6,900 (-74.2)	-7,100 (-76.3)	-7,000 (-75.3)
Oct	---	-6,500 (-82.3)	-6,500 (-82.3)	-6,500 (-82.3)	-6,400 (-81.0)	-6,500 (-82.3)	-6,600 (-83.5)	-6,500 (-82.3)
Nov	---	-6,100 (-82.4)	-6,200 (-83.8)	-6,200 (-83.8)	-6,000 (-81.1)	-6,200 (-83.8)	-6,200 (-83.8)	-6,100 (-82.4)
Dec	---	-5,700 (-81.4)	-5,800 (-82.9)	-5,800 (-82.9)	-5,700 (-81.4)	-5,800 (-82.9)	-5,800 (-82.9)	-5,800 (-82.9)
Average	---	-3,100 (-38.8)	-3,100 (-38.8)	-3,100 (-38.8)	-2,900 (-36.3)	-3,100 (-38.8)	-3,300 (-41.3)	-3,200 (-40.0)

Simulated water surface elevation for Lake Henry is presented in Table 233 through Table 236 for the direct effects analysis, and Table 237 through Table 240 for the cumulative effects analysis. Simulated surface area for Lake Henry is presented in Table 241 through Table 244 for the direct effects analysis, and Table 245 through Table 248 for the cumulative effects analysis.

Table 233. Monthly Water Surface Elevation Overall Average – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.0	4,374.3	4,374.1	4,374.1	4,374.5	4,374.1	4,374.0	4,374.0
Feb	4,374.4	4,374.7	4,374.5	4,374.6	4,374.9	4,374.5	4,374.5	4,374.5
Mar	4,374.9	4,375.1	4,375.0	4,375.1	4,375.2	4,375.0	4,375.0	4,375.0
Apr	4,374.8	4,374.9	4,374.8	4,374.9	4,375.0	4,374.8	4,374.8	4,374.8
May	4,374.7	4,374.8	4,374.7	4,374.7	4,374.9	4,374.7	4,374.7	4,374.7
Jun	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3
Jul	4,375.1	4,375.1	4,375.0	4,375.0	4,375.1	4,375.0	4,375.0	4,375.0
Aug	4,374.5	4,374.5	4,374.5	4,374.5	4,374.6	4,374.5	4,374.5	4,374.4
Sep	4,374.3	4,374.4	4,374.3	4,374.3	4,374.5	4,374.3	4,374.3	4,374.3
Oct	4,374.1	4,374.3	4,374.1	4,374.1	4,374.5	4,374.1	4,374.1	4,374.1
Nov	4,374.2	4,374.4	4,374.0	4,374.1	4,374.5	4,374.0	4,374.1	4,374.0
Dec	4,374.1	4,374.3	4,374.0	4,374.0	4,374.4	4,374.0	4,374.0	4,374.0
Average	4,374.5	4,374.7	4,374.5	4,374.5	4,374.8	4,374.5	4,374.5	4,374.5
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.2 (-2.4)	-0.2 (-2.4)	0.2 (2.4)	-0.2 (-2.4)	-0.3 (-3.7)	-0.3 (-3.7)
Feb	---	---	-0.2 (-2.3)	-0.1 (-1.2)	0.2 (2.3)	-0.2 (-2.3)	-0.2 (-2.3)	-0.2 (-2.3)
Mar	---	---	-0.1 (-1.1)	0.0 (0.0)	0.1 (1.1)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Apr	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.1 (1.1)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
May	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.1 (1.1)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Jun	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.2)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.2)
Sep	---	---	-0.1 (-1.2)	-0.1 (-1.2)	0.1 (1.2)	-0.1 (-1.2)	-0.1 (-1.2)	-0.1 (-1.2)
Oct	---	---	-0.2 (-2.4)	-0.2 (-2.4)	0.2 (2.4)	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)
Nov	---	---	-0.4 (-4.8)	-0.4 (-4.8)	0.1 (1.2)	-0.4 (-4.8)	-0.3 (-3.6)	-0.4 (-4.8)
Dec	---	---	-0.3 (-3.7)	-0.3 (-3.7)	0.1 (1.2)	-0.3 (-3.7)	-0.3 (-3.7)	-0.3 (-3.7)
Average	---	---	-0.2 (-1.8)	-0.1 (-1.7)	0.1 (1.3)	-0.1 (-1.7)	-0.1 (-1.7)	-0.2 (-1.9)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.3 (3.8)	0.1 (1.3)	0.1 (1.3)	0.5 (6.3)	0.1 (1.3)	0.0 (0.0)	0.0 (0.0)
Feb	---	0.3 (3.6)	0.1 (1.2)	0.2 (2.4)	0.5 (6.0)	0.1 (1.2)	0.1 (1.2)	0.1 (1.2)
Mar	---	0.2 (2.3)	0.1 (1.1)	0.2 (2.3)	0.3 (3.4)	0.1 (1.1)	0.1 (1.1)	0.1 (1.1)
Apr	---	0.1 (1.1)	0.0 (0.0)	0.0 (0.0)	0.2 (2.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	0.1 (1.2)	0.0 (0.0)	0.0 (0.0)	0.2 (2.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jun	---	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (1.2)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.2)
Sep	---	0.1 (1.2)	0.0 (0.0)	0.0 (0.0)	0.2 (2.4)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	0.2 (2.5)	0.0 (0.0)	0.0 (0.0)	0.4 (5.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Nov	---	0.2 (2.5)	-0.2 (-2.5)	-0.2 (-2.5)	0.3 (3.7)	-0.2 (-2.5)	-0.1 (-1.2)	-0.2 (-2.5)
Dec	---	0.2 (2.5)	-0.1 (-1.3)	-0.1 (-1.3)	0.3 (3.8)	-0.1 (-1.3)	-0.1 (-1.3)	-0.1 (-1.3)
Average	---	0.1 (1.7)	0.0 (-0.2)	0.0 (0.0)	0.3 (3.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.3)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 234. Monthly Water Surface Elevation Normal Year (2005) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.0	4,373.7	4,373.3	4,373.3	4,373.7	4,373.3	4,373.4	4,373.3
Feb	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0
Mar	4,375.3	4,375.4	4,375.5	4,375.5	4,375.5	4,375.5	4,375.5	4,375.5
Apr	4,374.7	4,374.8	4,375.0	4,375.0	4,374.9	4,375.0	4,375.0	4,375.0
May	4,374.9	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1
Jun	4,375.9	4,375.8	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9
Jul	4,376.0	4,376.0	4,375.9	4,376.0	4,376.0	4,376.0	4,376.0	4,375.9
Aug	4,375.9	4,375.9	4,375.8	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9
Sep	4,375.3	4,375.3	4,375.4	4,375.3	4,375.4	4,375.3	4,375.3	4,375.4
Oct	4,374.4	4,374.4	4,374.4	4,374.3	4,374.5	4,374.3	4,374.4	4,374.2
Nov	4,373.8	4,373.8	4,373.6	4,373.6	4,373.9	4,373.6	4,373.7	4,373.5
Dec	4,373.5	4,373.5	4,373.3	4,373.3	4,373.6	4,373.3	4,373.3	4,373.2
Average	4,375.0	4,375.0	4,374.9	4,374.9	4,375.0	4,374.9	4,375.0	4,374.9
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.4 (-5.3)	-0.4 (-4.6)	0.0 (-0.3)	-0.4 (-5.3)	-0.3 (-3.6)	-0.3 (-4.5)
Feb	---	---	-0.1 (-0.8)	0.0 (-0.4)	0.0 (-0.1)	-0.1 (-0.8)	0.0 (0.0)	0.0 (-0.4)
Mar	---	---	0.1 (1.3)	0.1 (1.1)	0.0 (0.3)	0.1 (1.3)	0.1 (0.9)	0.1 (0.9)
Apr	---	---	0.1 (1.5)	0.1 (1.6)	0.1 (0.8)	0.1 (1.5)	0.1 (1.5)	0.1 (1.4)
May	---	---	0.0 (0.1)	0.0 (0.1)	0.0 (0.4)	0.0 (0.1)	0.1 (0.7)	0.0 (0.2)
Jun	---	---	0.1 (1.0)	0.1 (1.0)	0.1 (0.7)	0.1 (1.0)	0.1 (1.0)	0.1 (0.9)
Jul	---	---	0.0 (-0.2)	0.0 (-0.1)	0.0 (0.0)	0.0 (-0.1)	0.0 (-0.1)	0.0 (-0.2)
Aug	---	---	-0.1 (-0.5)	0.0 (-0.3)	0.0 (-0.1)	0.0 (-0.4)	0.0 (0.0)	0.0 (-0.1)
Sep	---	---	0.0 (0.3)	0.0 (0.0)	0.0 (0.2)	0.0 (0.1)	0.0 (0.1)	0.1 (0.5)
Oct	---	---	-0.1 (-0.6)	-0.1 (-1.1)	0.1 (1.1)	-0.1 (-1.1)	0.0 (-0.5)	-0.2 (-2.3)
Nov	---	---	-0.2 (-2.7)	-0.2 (-2.6)	0.1 (0.6)	-0.2 (-2.7)	-0.2 (-2.1)	-0.3 (-4.3)
Dec	---	---	-0.2 (-2.7)	-0.2 (-2.6)	0.1 (0.8)	-0.2 (-2.7)	-0.1 (-2.0)	-0.3 (-4.3)
Average	---	---	-0.1 (-0.6)	0.0 (-0.5)	0.0 (0.4)	-0.1 (-0.6)	0.0 (-0.2)	-0.1 (-0.8)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.3 (-3.4)	-0.7 (-8.5)	-0.6 (-7.9)	-0.3 (-3.7)	-0.7 (-8.5)	-0.5 (-6.9)	-0.6 (-7.8)
Feb	---	0.0 (0.0)	-0.1 (-0.8)	0.0 (-0.4)	0.0 (-0.1)	-0.1 (-0.8)	0.0 (0.0)	0.0 (-0.4)
Mar	---	0.1 (1.2)	0.2 (2.5)	0.2 (2.3)	0.1 (1.5)	0.2 (2.5)	0.2 (2.1)	0.2 (2.1)
Apr	---	0.2 (2.2)	0.3 (3.7)	0.3 (3.9)	0.3 (3.0)	0.3 (3.7)	0.3 (3.7)	0.3 (3.6)
May	---	0.1 (1.7)	0.2 (1.8)	0.2 (1.8)	0.2 (2.2)	0.2 (1.8)	0.2 (2.4)	0.2 (1.9)
Jun	---	-0.1 (-1.0)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.3)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)
Jul	---	0.0 (-0.1)	0.0 (-0.3)	0.0 (-0.2)	0.0 (-0.1)	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.3)
Aug	---	0.0 (0.0)	-0.1 (-0.5)	0.0 (-0.3)	0.0 (-0.1)	0.0 (-0.4)	0.0 (0.0)	0.0 (-0.1)
Sep	---	0.0 (-0.1)	0.0 (0.2)	0.0 (-0.1)	0.0 (0.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.4)
Oct	---	0.0 (0.5)	0.0 (-0.1)	-0.1 (-0.6)	0.1 (1.6)	-0.1 (-0.6)	0.0 (0.0)	-0.2 (-1.8)
Nov	---	0.1 (0.9)	-0.1 (-1.8)	-0.1 (-1.7)	0.1 (1.6)	-0.1 (-1.8)	-0.1 (-1.2)	-0.3 (-3.4)
Dec	---	0.0 (0.4)	-0.2 (-2.3)	-0.2 (-2.2)	0.1 (1.2)	-0.2 (-2.3)	-0.1 (-1.6)	-0.3 (-3.9)
Average	---	0.0 (0.2)	0.0 (-0.4)	0.0 (-0.3)	0.0 (0.6)	0.0 (-0.4)	0.0 (0.0)	-0.1 (-0.6)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 235. Monthly Water Surface Elevation Wet Year (1997) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.6	4,374.6	4,374.6	4,374.6	4,374.6	4,374.6	4,374.6	4,374.6
Feb	4,374.4	4,374.4	4,374.6	4,374.6	4,374.6	4,374.6	4,374.6	4,374.5
Mar	4,373.9	4,373.9	4,374.2	4,374.2	4,374.1	4,374.2	4,374.1	4,374.1
Apr	4,373.1	4,373.0	4,373.3	4,373.3	4,373.2	4,373.3	4,373.2	4,373.1
May	4,374.6	4,374.6	4,374.8	4,374.7	4,374.9	4,374.8	4,374.7	4,374.6
Jun	4,375.9	4,376.0	4,375.9	4,375.9	4,376.0	4,375.9	4,375.9	4,375.9
Jul	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7
Aug	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0	4,376.0
Sep	4,375.0	4,375.1	4,375.0	4,375.0	4,375.1	4,375.0	4,375.0	4,375.0
Oct	4,375.0	4,375.3	4,375.2	4,375.2	4,375.4	4,375.2	4,375.2	4,375.2
Nov	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9
Dec	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7	4,375.7
Average	4,375.0	4,375.0	4,375.1	4,375.1	4,375.1	4,375.1	4,375.0	4,375.0
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	---	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.1 (1.2)
Mar	---	---	0.3 (3.8)	0.3 (3.8)	0.2 (2.6)	0.3 (3.8)	0.2 (2.6)	0.2 (2.6)
Apr	---	---	0.3 (4.3)	0.3 (4.3)	0.2 (2.9)	0.3 (4.3)	0.2 (2.9)	0.1 (1.4)
May	---	---	0.2 (2.4)	0.1 (1.2)	0.3 (3.5)	0.2 (2.4)	0.1 (1.2)	0.0 (0.0)
Jun	---	---	-0.1 (-1.0)	-0.1 (-1.0)	0.0 (0.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Oct	---	---	-0.1 (-1.1)	-0.1 (-1.1)	0.1 (1.1)	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)
Nov	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	0.1 (0.7)	0.1 (0.6)	0.1 (0.9)	0.1 (0.7)	0.0 (0.4)	0.0 (0.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	0.0 (0.0)	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.2 (2.4)	0.1 (1.2)
Mar	---	0.0 (0.0)	0.3 (3.8)	0.3 (3.8)	0.2 (2.6)	0.3 (3.8)	0.2 (2.6)	0.2 (2.6)
Apr	---	-0.1 (-1.4)	0.2 (2.9)	0.2 (2.9)	0.1 (1.4)	0.2 (2.9)	0.1 (1.4)	0.0 (0.0)
May	---	0.0 (0.0)	0.2 (2.4)	0.1 (1.2)	0.3 (3.5)	0.2 (2.4)	0.1 (1.2)	0.0 (0.0)
Jun	---	0.1 (1.0)	0.0 (0.0)	0.0 (0.0)	0.1 (1.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	0.2 (2.3)	0.1 (1.1)	0.1 (1.1)	0.2 (2.3)	0.1 (1.1)	0.1 (1.1)	0.1 (1.1)
Oct	---	0.3 (3.4)	0.2 (2.2)	0.2 (2.2)	0.4 (4.5)	0.2 (2.2)	0.2 (2.2)	0.2 (2.2)
Nov	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Dec	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	0.0 (0.5)	0.1 (1.1)	0.1 (1.0)	0.1 (1.4)	0.1 (1.1)	0.1 (0.8)	0.1 (0.6)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 236. Monthly Water Surface Elevation Dry Year (2004) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,371.5	4,371.8	4,373.5	4,373.5	4,373.4	4,373.5	4,372.6	4,372.9
Feb	4,371.9	4,372.3	4,374.2	4,374.2	4,373.9	4,374.2	4,373.2	4,373.5
Mar	4,374.5	4,374.7	4,375.2	4,375.2	4,375.2	4,375.1	4,375.0	4,375.2
Apr	4,374.9	4,374.8	4,374.8	4,374.8	4,374.9	4,374.8	4,374.8	4,374.9
May	4,375.7	4,375.7	4,375.6	4,375.6	4,375.6	4,375.6	4,375.7	4,375.7
Jun	4,375.4	4,375.3	4,375.3	4,375.4	4,374.7	4,375.3	4,375.4	4,375.3
Jul	4,375.6	4,375.6	4,375.6	4,375.6	4,375.6	4,375.6	4,375.6	4,375.6
Aug	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1	4,375.1	4,375.0
Sep	4,375.4	4,375.4	4,375.4	4,375.4	4,375.4	4,375.4	4,375.5	4,375.4
Oct	4,374.2	4,374.2	4,374.0	4,374.0	4,374.2	4,374.0	4,374.1	4,374.1
Nov	4,373.8	4,373.9	4,373.5	4,373.5	4,373.9	4,373.5	4,373.5	4,373.5
Dec	4,373.4	4,373.5	4,373.2	4,373.2	4,373.5	4,373.2	4,373.2	4,373.2
Average	4,374.3	4,374.3	4,374.6	4,374.6	4,374.6	4,374.6	4,374.5	4,374.5
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	1.8 (32.1)	1.8 (32.1)	1.6 (28.6)	1.8 (32.1)	0.9 (16.1)	1.2 (21.4)
Feb	---	---	1.9 (30.6)	1.9 (30.6)	1.6 (25.8)	1.9 (30.6)	0.9 (14.5)	1.2 (19.4)
Mar	---	---	0.5 (5.8)	0.5 (5.8)	0.5 (5.8)	0.4 (4.7)	0.3 (3.5)	0.5 (5.8)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.1)	0.0 (0.0)	0.0 (0.0)	0.1 (1.1)
May	---	---	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	0.0 (0.0)
Jun	---	---	0.0 (0.0)	0.1 (1.1)	-0.6 (-6.5)	0.0 (0.0)	0.1 (1.1)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.1)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.2 (-2.5)	-0.2 (-2.5)	0.0 (0.0)	-0.2 (-2.5)	-0.1 (-1.2)	-0.1 (-1.2)
Nov	---	---	-0.4 (-5.1)	-0.4 (-5.1)	0.0 (0.0)	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)
Dec	---	---	-0.3 (-4.1)	-0.3 (-4.1)	0.0 (0.0)	-0.3 (-4.1)	-0.3 (-4.1)	-0.3 (-4.1)
Average	---	---	0.3 (3.2)	0.3 (3.3)	0.3 (3.1)	0.3 (3.1)	0.1 (1.3)	0.2 (2.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	0.2 (3.7)	2.0 (37.0)	2.0 (37.0)	1.8 (33.3)	2.0 (37.0)	1.1 (20.4)	1.4 (25.9)
Feb	---	0.4 (6.9)	2.3 (39.7)	2.3 (39.7)	2.0 (34.5)	2.3 (39.7)	1.3 (22.4)	1.6 (27.6)
Mar	---	0.2 (2.4)	0.7 (8.3)	0.7 (8.3)	0.7 (8.3)	0.6 (7.1)	0.5 (6.0)	0.7 (8.3)
Apr	---	-0.1 (-1.1)	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)
May	---	0.0 (0.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)	0.0 (0.0)
Jun	---	-0.1 (-1.1)	-0.1 (-1.1)	0.0 (0.0)	-0.7 (-7.5)	-0.1 (-1.1)	0.0 (0.0)	-0.1 (-1.1)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.1)
Sep	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	0.0 (0.0)	-0.2 (-2.5)	-0.2 (-2.5)	0.0 (0.0)	-0.2 (-2.5)	-0.1 (-1.2)	-0.1 (-1.2)
Nov	---	0.1 (1.3)	-0.3 (-3.9)	-0.3 (-3.9)	0.1 (1.3)	-0.3 (-3.9)	-0.3 (-3.9)	-0.3 (-3.9)
Dec	---	0.1 (1.4)	-0.2 (-2.7)	-0.2 (-2.7)	0.1 (1.4)	-0.2 (-2.7)	-0.2 (-2.7)	-0.2 (-2.7)
Average	---	0.1 (0.8)	0.3 (4.1)	0.3 (4.2)	0.3 (4.0)	0.3 (4.0)	0.2 (2.1)	0.2 (3.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 237. Monthly Water Surface Elevation Overall Average – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.0	4,371.5	4,371.5	4,371.5	4,371.6	4,371.5	4,371.4	4,371.2
Feb	4,374.4	4,372.3	4,372.5	4,372.4	4,372.5	4,372.5	4,372.2	4,372.2
Mar	4,374.9	4,373.4	4,373.5	4,373.3	4,373.5	4,373.4	4,373.3	4,373.3
Apr	4,374.8	4,373.4	4,373.5	4,373.5	4,373.5	4,373.5	4,373.4	4,373.4
May	4,374.7	4,373.1	4,373.1	4,373.2	4,373.3	4,373.2	4,373.0	4,373.0
Jun	4,375.3	4,373.3	4,373.3	4,373.3	4,373.4	4,373.3	4,373.3	4,373.2
Jul	4,375.1	4,373.3	4,373.3	4,373.3	4,373.5	4,373.3	4,373.2	4,373.2
Aug	4,374.5	4,372.4	4,372.6	4,372.4	4,372.5	4,372.5	4,372.4	4,372.4
Sep	4,374.3	4,371.6	4,371.8	4,371.7	4,371.7	4,371.8	4,371.7	4,371.6
Oct	4,374.1	4,370.9	4,371.0	4,371.0	4,371.0	4,371.0	4,370.7	4,370.7
Nov	4,374.2	4,370.9	4,370.9	4,370.8	4,371.0	4,370.8	4,370.7	4,370.6
Dec	4,374.1	4,371.2	4,371.2	4,371.2	4,371.3	4,371.2	4,371.1	4,370.9
Average	4,374.5	4,372.3	4,372.3	4,372.3	4,372.4	4,372.3	4,372.2	4,372.1
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.9)	0.0 (0.0)	-0.1 (-1.9)	-0.3 (-5.6)
Feb	---	---	0.2 (3.2)	0.1 (1.6)	0.2 (3.2)	0.2 (3.2)	-0.1 (-1.6)	-0.2 (-3.2)
Mar	---	---	0.1 (1.4)	-0.1 (-1.4)	0.1 (1.4)	0.0 (0.0)	-0.2 (-2.7)	-0.1 (-1.4)
Apr	---	---	0.1 (1.4)	0.1 (1.4)	0.1 (1.4)	0.1 (1.4)	0.0 (0.0)	0.0 (0.0)
May	---	---	0.0 (0.0)	0.1 (1.4)	0.2 (2.9)	0.1 (1.4)	-0.1 (-1.4)	-0.1 (-1.4)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.4)	0.0 (0.0)	0.0 (0.0)	-0.1 (-1.4)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (1.4)	0.0 (0.0)	-0.1 (-1.4)	-0.1 (-1.4)
Aug	---	---	0.1 (1.6)	0.0 (0.0)	0.1 (1.6)	0.1 (1.6)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.2 (3.6)	0.1 (1.8)	0.1 (1.8)	0.2 (3.6)	0.1 (1.8)	0.0 (0.0)
Oct	---	---	0.1 (2.1)	0.0 (0.0)	0.1 (2.1)	0.0 (0.0)	-0.2 (-4.2)	-0.2 (-4.2)
Nov	---	---	0.0 (0.0)	-0.1 (-2.1)	0.1 (2.1)	-0.1 (-2.1)	-0.2 (-4.2)	-0.3 (-6.3)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.1 (2.0)	0.0 (0.0)	-0.1 (-2.0)	-0.3 (-5.9)
Average	---	---	0.1 (1.1)	0.0 (0.3)	0.1 (1.9)	0.1 (0.8)	-0.1 (-1.3)	-0.1 (-2.3)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-2.5 (-31.6)	-2.5 (-31.6)	-2.5 (-31.6)	-2.4 (-30.4)	-2.5 (-31.6)	-2.6 (-32.9)	-2.8 (-35.4)
Feb	---	-2.1 (-25.3)	-1.9 (-22.9)	-2.0 (-24.1)	-1.9 (-22.9)	-1.9 (-22.9)	-2.2 (-26.5)	-2.3 (-27.7)
Mar	---	-1.5 (-17.0)	-1.4 (-15.9)	-1.6 (-18.2)	-1.4 (-15.9)	-1.5 (-17.0)	-1.7 (-19.3)	-1.6 (-18.2)
Apr	---	-1.4 (-16.1)	-1.3 (-14.9)	-1.3 (-14.9)	-1.3 (-14.9)	-1.3 (-14.9)	-1.4 (-16.1)	-1.4 (-16.1)
May	---	-1.6 (-18.6)	-1.6 (-18.6)	-1.5 (-17.4)	-1.4 (-16.3)	-1.5 (-17.4)	-1.7 (-19.8)	-1.7 (-19.8)
Jun	---	-2.0 (-21.7)	-2.0 (-21.7)	-2.0 (-21.7)	-1.9 (-20.7)	-2.0 (-21.7)	-2.0 (-21.7)	-2.1 (-22.8)
Jul	---	-1.8 (-20.0)	-1.8 (-20.0)	-1.8 (-20.0)	-1.7 (-18.9)	-1.8 (-20.0)	-1.9 (-21.1)	-1.9 (-21.1)
Aug	---	-2.1 (-25.0)	-2.0 (-23.8)	-2.1 (-25.0)	-2.0 (-23.8)	-2.0 (-23.8)	-2.1 (-25.0)	-2.1 (-25.0)
Sep	---	-2.7 (-32.9)	-2.5 (-30.5)	-2.6 (-31.7)	-2.6 (-31.7)	-2.5 (-30.5)	-2.6 (-31.7)	-2.7 (-32.9)
Oct	---	-3.2 (-40.0)	-3.1 (-38.8)	-3.2 (-40.0)	-3.1 (-38.8)	-3.2 (-40.0)	-3.4 (-42.5)	-3.4 (-42.5)
Nov	---	-3.3 (-40.7)	-3.3 (-40.7)	-3.4 (-42.0)	-3.2 (-39.5)	-3.4 (-42.0)	-3.5 (-43.2)	-3.6 (-44.4)
Dec	---	-2.9 (-36.3)	-2.9 (-36.3)	-2.9 (-36.3)	-2.8 (-35.0)	-2.9 (-36.3)	-3.0 (-37.5)	-3.2 (-40.0)
Average	---	-2.3 (-26.8)	-2.2 (-26.0)	-2.2 (-26.6)	-2.1 (-25.4)	-2.2 (-26.2)	-2.3 (-27.8)	-2.4 (-28.5)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 238. Monthly Water Surface Elevation Normal Year (2005) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.0	4,367.9	4,367.8	4,367.8	4,367.9	4,367.8	4,367.8	4,367.8
Feb	4,376.0	4,371.3	4,372.0	4,372.0	4,372.1	4,372.0	4,371.3	4,371.3
Mar	4,375.3	4,376.0	4,375.9	4,376.0	4,376.0	4,375.9	4,376.0	4,375.9
Apr	4,374.7	4,375.7	4,375.6	4,375.8	4,375.8	4,375.8	4,375.8	4,375.6
May	4,374.9	4,375.2	4,375.3	4,375.4	4,375.3	4,375.3	4,375.2	4,375.2
Jun	4,375.9	4,375.4	4,375.4	4,375.4	4,375.4	4,375.4	4,375.6	4,375.5
Jul	4,376.0	4,375.8	4,375.7	4,375.7	4,375.7	4,375.7	4,375.8	4,375.8
Aug	4,375.9	4,375.8	4,375.9	4,375.9	4,375.9	4,375.9	4,375.8	4,375.9
Sep	4,375.3	4,374.9	4,375.0	4,375.0	4,375.0	4,375.0	4,375.0	4,375.0
Oct	4,374.4	4,373.0	4,373.2	4,373.3	4,373.2	4,373.2	4,373.2	4,373.0
Nov	4,373.8	4,369.7	4,370.1	4,370.1	4,370.0	4,369.9	4,369.8	4,369.7
Dec	4,373.5	4,368.9	4,369.3	4,369.3	4,369.2	4,369.2	4,369.0	4,368.9
Average	4,375.0	4,373.3	4,373.4	4,373.5	4,373.5	4,373.4	4,373.3	4,373.3
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.1 (-4.5)	-0.1 (-4.5)	0.0 (1.7)	-0.1 (-4.5)	-0.1 (-5.1)	-0.1 (-3.9)
Feb	---	---	0.7 (13.4)	0.7 (12.9)	0.7 (14.2)	0.7 (12.9)	0.0 (-0.6)	0.0 (0.2)
Mar	---	---	-0.1 (-0.7)	0.0 (0.0)	0.0 (0.0)	0.0 (-0.1)	0.0 (0.2)	0.0 (-0.4)
Apr	---	---	-0.1 (-0.8)	0.1 (1.5)	0.1 (0.9)	0.1 (0.7)	0.1 (0.5)	-0.1 (-1.1)
May	---	---	0.1 (0.7)	0.2 (2.1)	0.1 (1.5)	0.1 (1.5)	0.0 (0.4)	0.0 (-0.2)
Jun	---	---	0.0 (-0.2)	0.0 (-0.2)	0.0 (-0.3)	0.0 (-0.3)	0.1 (1.6)	0.0 (0.3)
Jul	---	---	-0.2 (-1.6)	-0.2 (-1.6)	-0.1 (-1.4)	-0.2 (-1.7)	-0.1 (-0.6)	-0.1 (-0.8)
Aug	---	---	0.1 (1.0)	0.1 (1.0)	0.1 (1.1)	0.1 (0.9)	0.0 (0.1)	0.0 (0.3)
Sep	---	---	0.1 (0.9)	0.1 (0.9)	0.1 (1.0)	0.1 (0.8)	0.1 (0.8)	0.1 (0.6)
Oct	---	---	0.2 (2.9)	0.2 (3.0)	0.2 (2.3)	0.2 (2.7)	0.1 (1.6)	0.0 (-0.4)
Nov	---	---	0.3 (9.1)	0.3 (9.4)	0.2 (6.6)	0.2 (5.8)	0.1 (1.4)	-0.1 (-1.7)
Dec	---	---	0.4 (13.7)	0.4 (13.7)	0.3 (10.6)	0.3 (9.5)	0.1 (1.8)	-0.1 (-2.1)
Average	---	---	0.1 (1.7)	0.2 (2.1)	0.1 (2.0)	0.1 (1.6)	0.0 (0.4)	0.0 (-0.4)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-6.1 (-77.3)	-6.1 (-78.3)	-6.1 (-78.3)	-6.0 (-76.9)	-6.1 (-78.3)	-6.2 (-78.5)	-6.1 (-78.2)
Feb	---	-4.7 (-47.6)	-4.0 (-40.5)	-4.1 (-40.8)	-4.0 (-40.1)	-4.1 (-40.8)	-4.8 (-47.9)	-4.7 (-47.5)
Mar	---	0.6 (6.9)	0.6 (6.2)	0.6 (6.9)	0.6 (6.9)	0.6 (6.8)	0.7 (7.2)	0.6 (6.5)
Apr	---	1.1 (12.3)	1.0 (11.3)	1.2 (13.9)	1.1 (13.3)	1.1 (13.1)	1.1 (12.9)	0.9 (11.0)
May	---	0.3 (3.1)	0.3 (3.7)	0.5 (5.2)	0.4 (4.6)	0.4 (4.6)	0.3 (3.5)	0.3 (2.8)
Jun	---	-0.5 (-4.7)	-0.5 (-4.9)	-0.5 (-4.9)	-0.5 (-5.0)	-0.5 (-5.0)	-0.3 (-3.2)	-0.4 (-4.4)
Jul	---	-0.1 (-1.3)	-0.3 (-2.9)	-0.3 (-2.9)	-0.3 (-2.7)	-0.3 (-3.0)	-0.2 (-1.9)	-0.2 (-2.1)
Aug	---	-0.1 (-0.7)	0.0 (0.3)	0.0 (0.3)	0.0 (0.4)	0.0 (0.2)	-0.1 (-0.6)	0.0 (-0.4)
Sep	---	-0.4 (-4.3)	-0.3 (-3.5)	-0.3 (-3.5)	-0.3 (-3.4)	-0.3 (-3.6)	-0.3 (-3.6)	-0.4 (-3.8)
Oct	---	-1.4 (-16.3)	-1.2 (-13.9)	-1.1 (-13.8)	-1.2 (-14.4)	-1.2 (-14.0)	-1.2 (-15.0)	-1.4 (-16.6)
Nov	---	-4.0 (-52.7)	-3.7 (-48.4)	-3.7 (-48.2)	-3.8 (-49.5)	-3.8 (-49.9)	-4.0 (-52.0)	-4.1 (-53.5)
Dec	---	-4.5 (-61.4)	-4.1 (-56.1)	-4.1 (-56.1)	-4.2 (-57.3)	-4.3 (-57.7)	-4.5 (-60.7)	-4.6 (-62.2)
Average	---	-1.6 (-18.6)	-1.5 (-17.3)	-1.5 (-16.9)	-1.5 (-17.0)	-1.5 (-17.3)	-1.6 (-18.3)	-1.7 (-18.9)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 239. Monthly Water Surface Elevation Wet Year (1997) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,374.6	4,374.3	4,374.1	4,374.1	4,373.8	4,374.1	4,374.1	4,374.1
Feb	4,374.4	4,374.2	4,373.9	4,373.9	4,373.6	4,373.9	4,374.0	4,374.1
Mar	4,373.9	4,373.4	4,373.2	4,373.2	4,372.8	4,373.2	4,373.2	4,374.2
Apr	4,373.1	4,371.9	4,371.9	4,371.8	4,371.4	4,371.8	4,371.8	4,372.9
May	4,374.6	4,373.7	4,373.6	4,373.5	4,373.3	4,373.5	4,373.5	4,374.4
Jun	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9	4,375.9
Jul	4,375.7	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3	4,375.3
Aug	4,376.0	4,375.8	4,375.8	4,375.8	4,375.8	4,375.8	4,375.8	4,375.8
Sep	4,375.0	4,370.7	4,371.1	4,371.2	4,370.9	4,371.3	4,370.8	4,370.8
Oct	4,375.0	4,368.3	4,368.4	4,368.4	4,368.4	4,368.4	4,368.2	4,368.3
Nov	4,375.9	4,371.8	4,371.2	4,371.3	4,371.8	4,371.3	4,371.6	4,371.6
Dec	4,375.7	4,373.4	4,372.8	4,372.8	4,373.4	4,372.9	4,373.1	4,373.1
Average	4,375.0	4,373.2	4,373.1	4,373.1	4,373.0	4,373.1	4,373.1	4,373.4
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	-0.2 (-2.4)	-0.2 (-2.4)	-0.5 (-6.1)	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)
Feb	---	---	-0.3 (-3.7)	-0.3 (-3.7)	-0.6 (-7.4)	-0.3 (-3.7)	-0.3 (-3.7)	-0.1 (-1.2)
Mar	---	---	-0.2 (-2.7)	-0.3 (-4.1)	-0.6 (-8.2)	-0.2 (-2.7)	-0.2 (-2.7)	0.8 (11.0)
Apr	---	---	0.0 (0.0)	-0.1 (-1.7)	-0.5 (-8.6)	-0.1 (-1.7)	-0.1 (-1.7)	1.0 (17.2)
May	---	---	-0.1 (-1.3)	-0.2 (-2.6)	-0.4 (-5.3)	-0.2 (-2.6)	-0.2 (-2.6)	0.7 (9.2)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.4 (8.7)	0.5 (10.9)	0.2 (4.3)	0.6 (13.0)	0.1 (2.2)	0.1 (2.2)
Oct	---	---	0.1 (4.5)	0.1 (4.5)	0.1 (4.5)	0.1 (4.5)	-0.1 (-4.5)	0.0 (0.0)
Nov	---	---	-0.6 (-10.5)	-0.5 (-8.8)	0.0 (0.0)	-0.5 (-8.8)	-0.2 (-3.5)	-0.2 (-3.5)
Dec	---	---	-0.6 (-8.2)	-0.6 (-8.2)	0.0 (0.0)	-0.5 (-6.8)	-0.3 (-4.1)	-0.3 (-4.1)
Average	---	---	-0.1 (-1.8)	-0.1 (-1.9)	-0.2 (-2.7)	-0.1 (-1.5)	-0.1 (-1.8)	0.2 (2.1)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	-0.3 (-3.5)	-0.5 (-5.9)	-0.5 (-5.9)	-0.8 (-9.4)	-0.5 (-5.9)	-0.5 (-5.9)	-0.5 (-5.9)
Feb	---	-0.2 (-2.4)	-0.5 (-6.0)	-0.5 (-6.0)	-0.8 (-9.6)	-0.5 (-6.0)	-0.5 (-6.0)	-0.3 (-3.6)
Mar	---	-0.5 (-6.4)	-0.7 (-9.0)	-0.8 (-10.3)	-1.1 (-14.1)	-0.7 (-9.0)	-0.7 (-9.0)	0.3 (3.8)
Apr	---	-1.2 (-17.1)	-1.2 (-17.1)	-1.3 (-18.6)	-1.7 (-24.3)	-1.3 (-18.6)	-1.3 (-18.6)	-0.2 (-2.9)
May	---	-0.9 (-10.6)	-1.0 (-11.8)	-1.1 (-12.9)	-1.3 (-15.3)	-1.1 (-12.9)	-1.1 (-12.9)	-0.2 (-2.4)
Jun	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	-0.4 (-4.2)	-0.4 (-4.2)	-0.4 (-4.2)	-0.4 (-4.2)	-0.4 (-4.2)	-0.4 (-4.2)	-0.4 (-4.2)
Aug	---	-0.2 (-2.0)	-0.2 (-2.0)	-0.2 (-2.0)	-0.2 (-2.0)	-0.2 (-2.0)	-0.2 (-2.0)	-0.2 (-2.0)
Sep	---	-4.2 (-47.7)	-3.8 (-43.2)	-3.7 (-42.0)	-4.0 (-45.5)	-3.6 (-40.9)	-4.1 (-46.6)	-4.1 (-46.6)
Oct	---	-6.7 (-75.3)	-6.6 (-74.2)	-6.6 (-74.2)	-6.6 (-74.2)	-6.6 (-74.2)	-6.8 (-76.4)	-6.7 (-75.3)
Nov	---	-4.1 (-41.8)	-4.7 (-48.0)	-4.6 (-46.9)	-4.1 (-41.8)	-4.6 (-46.9)	-4.3 (-43.9)	-4.3 (-43.9)
Dec	---	-2.3 (-24.0)	-2.9 (-30.2)	-2.9 (-30.2)	-2.3 (-24.0)	-2.8 (-29.2)	-2.6 (-27.1)	-2.6 (-27.1)
Average	---	-1.7 (-19.7)	-1.9 (-21.1)	-1.9 (-21.2)	-1.9 (-21.9)	-1.9 (-20.9)	-1.9 (-21.1)	-1.6 (-18.0)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 240. Monthly Water Surface Elevation Dry Year (2004) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Surface Elevation (ft)								
Jan	4,371.5	4,372.8	4,373.7	4,373.8	4,373.3	4,373.7	4,372.7	4,372.9
Feb	4,371.9	4,375.3	4,375.5	4,375.5	4,375.4	4,375.5	4,375.2	4,375.3
Mar	4,374.5	4,375.9	4,375.8	4,375.8	4,375.9	4,375.8	4,375.8	4,375.8
Apr	4,374.9	4,375.5	4,375.5	4,375.5	4,375.6	4,375.5	4,375.5	4,375.5
May	4,375.7	4,371.9	4,372.0	4,372.0	4,372.1	4,372.1	4,371.9	4,372.0
Jun	4,375.4	4,369.1	4,369.1	4,369.1	4,369.1	4,369.1	4,369.1	4,369.1
Jul	4,375.6	4,372.5	4,372.4	4,372.3	4,372.5	4,372.2	4,371.6	4,372.2
Aug	4,375.1	4,370.3	4,370.1	4,370.1	4,370.9	4,370.0	4,369.6	4,369.8
Sep	4,375.4	4,369.0	4,369.1	4,369.0	4,369.8	4,369.0	4,368.8	4,368.9
Oct	4,374.2	4,367.9	4,367.8	4,367.8	4,368.0	4,367.8	4,367.8	4,367.9
Nov	4,373.8	4,367.8	4,367.7	4,367.7	4,367.8	4,367.7	4,367.7	4,367.7
Dec	4,373.4	4,367.7	4,367.6	4,367.6	4,367.8	4,367.6	4,367.6	4,367.7
Average	4,374.3	4,371.3	4,371.4	4,371.4	4,371.5	4,371.3	4,371.1	4,371.2
Change in Water Surface Elevation Compared to No Action [ft (%)]								
Jan	---	---	0.9 (13.4)	1.0 (14.9)	0.5 (7.5)	0.9 (13.4)	-0.1 (-1.5)	0.1 (1.5)
Feb	---	---	0.2 (2.2)	0.2 (2.2)	0.1 (1.1)	0.2 (2.2)	-0.1 (-1.1)	0.0 (0.0)
Mar	---	---	-0.1 (-1.0)	-0.1 (-1.0)	0.0 (0.0)	-0.1 (-1.0)	-0.1 (-1.0)	-0.1 (-1.0)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	---	0.1 (1.7)	0.1 (1.7)	0.2 (3.4)	0.2 (3.4)	0.0 (0.0)	0.1 (1.7)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	-0.1 (-1.6)	-0.2 (-3.1)	0.0 (0.0)	-0.3 (-4.7)	-0.9 (-14.1)	-0.3 (-4.7)
Aug	---	---	-0.2 (-4.8)	-0.2 (-4.8)	0.6 (14.3)	-0.3 (-7.1)	-0.7 (-16.7)	-0.5 (-11.9)
Sep	---	---	0.1 (3.4)	0.0 (0.0)	0.8 (27.6)	0.0 (0.0)	-0.2 (-6.9)	-0.2 (-6.9)
Oct	---	---	-0.1 (-5.6)	-0.1 (-5.6)	0.1 (5.6)	-0.1 (-5.6)	-0.1 (-5.6)	0.0 (0.0)
Nov	---	---	-0.1 (-5.9)	-0.1 (-5.9)	0.0 (0.0)	-0.1 (-5.9)	-0.1 (-5.9)	-0.1 (-5.9)
Dec	---	---	-0.1 (-6.3)	-0.1 (-6.3)	0.1 (6.3)	-0.1 (-6.3)	-0.1 (-6.3)	0.0 (0.0)
Average	---	---	0.0 (1.0)	0.0 (0.8)	0.2 (3.8)	0.0 (0.5)	-0.2 (-3.8)	-0.1 (-1.6)
Change in Water Surface Elevation Compared to Existing Conditions [ft (%)]								
Jan	---	1.3 (24.1)	2.2 (40.7)	2.3 (42.6)	1.8 (33.3)	2.2 (40.7)	1.2 (22.2)	1.4 (25.9)
Feb	---	3.4 (58.6)	3.6 (62.1)	3.6 (62.1)	3.5 (60.3)	3.6 (62.1)	3.3 (56.9)	3.4 (58.6)
Mar	---	1.4 (16.7)	1.3 (15.5)	1.3 (15.5)	1.4 (16.7)	1.3 (15.5)	1.3 (15.5)	1.3 (15.5)
Apr	---	0.6 (6.8)	0.6 (6.8)	0.6 (6.8)	0.6 (6.8)	0.6 (6.8)	0.6 (6.8)	0.6 (6.8)
May	---	-3.8 (-39.6)	-3.7 (-38.5)	-3.7 (-38.5)	-3.6 (-37.5)	-3.6 (-37.5)	-3.8 (-39.6)	-3.7 (-38.5)
Jun	---	-6.3 (-67.7)	-6.3 (-67.7)	-6.3 (-67.7)	-6.3 (-67.7)	-6.3 (-67.7)	-6.3 (-67.7)	-6.3 (-67.7)
Jul	---	-3.1 (-32.6)	-3.2 (-33.7)	-3.3 (-34.7)	-3.1 (-32.6)	-3.4 (-35.8)	-4.0 (-42.1)	-3.4 (-35.8)
Aug	---	-4.8 (-53.3)	-5.0 (-55.6)	-5.0 (-55.6)	-4.2 (-46.7)	-5.1 (-56.7)	-5.5 (-61.1)	-5.3 (-58.9)
Sep	---	-6.4 (-68.8)	-6.3 (-67.7)	-6.4 (-68.8)	-5.6 (-60.2)	-6.4 (-68.8)	-6.6 (-71.0)	-6.6 (-71.0)
Oct	---	-6.3 (-77.8)	-6.4 (-79.0)	-6.4 (-79.0)	-6.2 (-76.5)	-6.4 (-79.0)	-6.4 (-79.0)	-6.3 (-77.8)
Nov	---	-6.0 (-77.9)	-6.1 (-79.2)	-6.1 (-79.2)	-6.0 (-77.9)	-6.1 (-79.2)	-6.1 (-79.2)	-6.1 (-79.2)
Dec	---	-5.7 (-78.1)	-5.8 (-79.5)	-5.8 (-79.5)	-5.6 (-76.7)	-5.8 (-79.5)	-5.8 (-79.5)	-5.7 (-78.1)
Average	---	-3.0 (-36.4)	-2.9 (-35.7)	-2.9 (-35.8)	-2.8 (-33.9)	-3.0 (-36.0)	-3.2 (-38.8)	-3.1 (-37.4)

* Percent changes are calculated using a minimum reservoir water elevation of 4366.1 feet.

Table 241. Monthly Surface Area Overall Average – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,168	1,181	1,170	1,171	1,188	1,170	1,168	1,167
Feb	1,187	1,199	1,191	1,193	1,207	1,191	1,188	1,188
Mar	1,209	1,218	1,216	1,217	1,222	1,215	1,214	1,213
Apr	1,203	1,211	1,207	1,207	1,214	1,207	1,207	1,206
May	1,199	1,205	1,201	1,201	1,208	1,201	1,200	1,201
Jun	1,229	1,230	1,228	1,228	1,230	1,228	1,228	1,228
Jul	1,217	1,218	1,216	1,216	1,220	1,216	1,216	1,216
Aug	1,187	1,190	1,187	1,188	1,194	1,187	1,187	1,185
Sep	1,179	1,181	1,178	1,180	1,187	1,178	1,177	1,176
Oct	1,171	1,180	1,170	1,170	1,187	1,169	1,169	1,168
Nov	1,173	1,184	1,167	1,168	1,190	1,167	1,168	1,166
Dec	1,168	1,180	1,166	1,167	1,187	1,166	1,166	1,165
Average	1,191	1,198	1,191	1,192	1,203	1,191	1,191	1,190
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-11 (-0.9)	-9 (-0.8)	7 (0.6)	-11 (-0.9)	-13 (-1.1)	-13 (-1.1)
Feb	---	---	-8 (-0.6)	-6 (-0.5)	8 (0.7)	-8 (-0.7)	-11 (-0.9)	-11 (-0.9)
Mar	---	---	-2 (-0.2)	-1 (-0.1)	4 (0.3)	-3 (-0.2)	-4 (-0.3)	-5 (-0.4)
Apr	---	---	-4 (-0.3)	-4 (-0.3)	3 (0.3)	-4 (-0.3)	-4 (-0.3)	-5 (-0.4)
May	---	---	-5 (-0.4)	-5 (-0.4)	3 (0.2)	-4 (-0.4)	-5 (-0.4)	-4 (-0.4)
Jun	---	---	-2 (-0.2)	-2 (-0.2)	0 (0.0)	-2 (-0.2)	-2 (-0.2)	-2 (-0.2)
Jul	---	---	-2 (-0.2)	-2 (-0.2)	1 (0.1)	-2 (-0.2)	-2 (-0.2)	-2 (-0.2)
Aug	---	---	-3 (-0.3)	-2 (-0.2)	4 (0.3)	-3 (-0.2)	-3 (-0.3)	-5 (-0.4)
Sep	---	---	-3 (-0.3)	-2 (-0.1)	6 (0.5)	-3 (-0.2)	-4 (-0.3)	-5 (-0.4)
Oct	---	---	-10 (-0.8)	-9 (-0.8)	7 (0.6)	-10 (-0.9)	-10 (-0.9)	-12 (-1.0)
Nov	---	---	-17 (-1.4)	-16 (-1.3)	7 (0.6)	-17 (-1.4)	-16 (-1.3)	-17 (-1.5)
Dec	---	---	-13 (-1.1)	-12 (-1.1)	7 (0.6)	-13 (-1.1)	-14 (-1.2)	-15 (-1.3)
Average	---	---	-7 (-0.6)	-6 (-0.5)	5 (0.4)	-7 (-0.6)	-7 (-0.6)	-8 (-0.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	13 (1.1)	2 (0.2)	3 (0.3)	20 (1.7)	2 (0.2)	0 (0.0)	0 (0.0)
Feb	---	12 (1.0)	5 (0.4)	6 (0.5)	20 (1.7)	4 (0.3)	1 (0.1)	1 (0.1)
Mar	---	9 (0.8)	7 (0.6)	8 (0.7)	14 (1.1)	6 (0.5)	5 (0.4)	4 (0.3)
Apr	---	8 (0.6)	4 (0.3)	4 (0.3)	11 (0.9)	4 (0.3)	4 (0.3)	3 (0.2)
May	---	7 (0.6)	2 (0.2)	2 (0.2)	10 (0.8)	2 (0.2)	2 (0.1)	3 (0.2)
Jun	---	1 (0.1)	-2 (-0.1)	-2 (-0.1)	1 (0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
Jul	---	1 (0.1)	-1 (-0.1)	-1 (-0.1)	3 (0.2)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
Aug	---	3 (0.2)	-1 (-0.1)	1 (0.0)	6 (0.5)	0 (0.0)	-1 (-0.1)	-2 (-0.2)
Sep	---	2 (0.2)	-1 (-0.1)	1 (0.1)	9 (0.7)	-1 (0.0)	-1 (-0.1)	-3 (-0.2)
Oct	---	9 (0.8)	-1 (-0.1)	0 (0.0)	16 (1.4)	-1 (-0.1)	-1 (-0.1)	-3 (-0.2)
Nov	---	11 (0.9)	-6 (-0.5)	-5 (-0.4)	17 (1.5)	-6 (-0.5)	-5 (-0.4)	-6 (-0.5)
Dec	---	11 (1.0)	-2 (-0.2)	-1 (-0.1)	18 (1.6)	-2 (-0.2)	-3 (-0.2)	-4 (-0.3)
Average	---	7 (0.6)	1 (0.0)	1 (0.1)	12 (1.0)	1 (0.0)	0 (0.0)	-1 (-0.1)

Table 242. Monthly Surface Area Normal Year (2005) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,161	1,148	1,130	1,132	1,147	1,130	1,136	1,132
Feb	1,268	1,267	1,263	1,266	1,267	1,263	1,267	1,265
Mar	1,229	1,234	1,241	1,240	1,236	1,241	1,239	1,239
Apr	1,193	1,203	1,210	1,210	1,207	1,210	1,210	1,209
May	1,208	1,216	1,216	1,217	1,218	1,217	1,219	1,217
Jun	1,260	1,255	1,260	1,260	1,258	1,260	1,260	1,260
Jul	1,264	1,263	1,262	1,263	1,263	1,263	1,263	1,262
Aug	1,260	1,260	1,257	1,258	1,260	1,258	1,260	1,259
Sep	1,230	1,230	1,232	1,230	1,231	1,231	1,231	1,233
Oct	1,180	1,182	1,180	1,178	1,187	1,178	1,181	1,173
Nov	1,150	1,153	1,144	1,144	1,155	1,144	1,146	1,139
Dec	1,137	1,139	1,130	1,130	1,141	1,130	1,132	1,125
Average	1,212	1,213	1,210	1,211	1,214	1,210	1,212	1,209
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-18 (-1.6)	-16 (-1.4)	-1 (-0.1)	-18 (-1.6)	-12 (-1.0)	-16 (-1.4)
Feb	---	---	-4 (-0.3)	-2 (-0.1)	-1 (0.0)	-4 (-0.3)	0 (0.0)	-2 (-0.2)
Mar	---	---	7 (0.6)	6 (0.5)	2 (0.1)	7 (0.6)	5 (0.4)	5 (0.4)
Apr	---	---	7 (0.6)	7 (0.6)	4 (0.3)	7 (0.6)	7 (0.6)	6 (0.5)
May	---	---	0 (0.0)	0 (0.0)	2 (0.1)	1 (0.0)	3 (0.2)	1 (0.1)
Jun	---	---	5 (0.4)	5 (0.4)	3 (0.3)	5 (0.4)	5 (0.4)	5 (0.4)
Jul	---	---	-1 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-0.1)
Aug	---	---	-2 (-0.2)	-1 (-0.1)	0 (0.0)	-2 (-0.2)	0 (0.0)	0 (0.0)
Sep	---	---	2 (0.1)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)	3 (0.2)
Oct	---	---	-3 (-0.2)	-4 (-0.4)	4 (0.4)	-4 (-0.4)	-2 (-0.1)	-9 (-0.8)
Nov	---	---	-9 (-0.8)	-9 (-0.7)	2 (0.2)	-9 (-0.8)	-7 (-0.6)	-14 (-1.2)
Dec	---	---	-9 (-0.8)	-8 (-0.7)	3 (0.2)	-9 (-0.7)	-7 (-0.6)	-14 (-1.2)
Average	---	---	-2 (-0.2)	-2 (-0.2)	2 (0.1)	-2 (-0.2)	-1 (-0.1)	-3 (-0.3)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-14 (-1.2)	-32 (-2.7)	-30 (-2.6)	-15 (-1.3)	-32 (-2.7)	-26 (-2.2)	-29 (-2.5)
Feb	---	0 (0.0)	-5 (-0.4)	-2 (-0.1)	-1 (0.0)	-4 (-0.3)	0 (0.0)	-2 (-0.2)
Mar	---	6 (0.5)	13 (1.0)	12 (0.9)	7 (0.6)	13 (1.0)	10 (0.8)	10 (0.8)
Apr	---	10 (0.8)	17 (1.4)	17 (1.4)	14 (1.1)	17 (1.4)	17 (1.4)	16 (1.3)
May	---	8 (0.7)	8 (0.7)	8 (0.7)	10 (0.8)	9 (0.7)	11 (0.9)	9 (0.8)
Jun	---	-5 (-0.4)	0 (0.0)	0 (0.0)	-2 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	-1 (0.0)	-1 (-0.1)	-1 (-0.1)	-1 (0.0)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)
Aug	---	0 (0.0)	-2 (-0.2)	-1 (-0.1)	0 (0.0)	-2 (-0.2)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	2 (0.1)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)	2 (0.2)
Oct	---	2 (0.2)	-1 (-0.1)	-3 (-0.2)	6 (0.5)	-2 (-0.2)	0 (0.0)	-7 (-0.6)
Nov	---	3 (0.2)	-6 (-0.5)	-6 (-0.5)	5 (0.4)	-6 (-0.5)	-4 (-0.3)	-11 (-1.0)
Dec	---	1 (0.1)	-8 (-0.7)	-7 (-0.6)	4 (0.3)	-7 (-0.6)	-5 (-0.5)	-13 (-1.1)
Average	---	1 (0.1)	-1 (-0.1)	-1 (-0.1)	2 (0.2)	-1 (-0.1)	0 (0.0)	-2 (-0.2)

Table 243. Monthly Surface Area Wet Year (1997) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)														
Jan	1,189	1,192	1,193		1,193		1,193		1,193		1,193		1,191	
Feb	1,179	1,182	1,192		1,193		1,188		1,192		1,188		1,187	
Mar	1,156	1,159	1,173		1,173		1,168		1,173		1,166		1,166	
Apr	1,122	1,118	1,133		1,133		1,129		1,133		1,127		1,125	
May	1,195	1,192	1,204		1,199		1,207		1,204		1,200		1,194	
Jun	1,262	1,264	1,262		1,262		1,264		1,262		1,262		1,262	
Jul	1,248	1,248	1,249		1,249		1,249		1,249		1,249		1,249	
Aug	1,264	1,264	1,264		1,264		1,265		1,264		1,264		1,264	
Sep	1,210	1,216	1,213		1,213		1,218		1,213		1,213		1,212	
Oct	1,210	1,227	1,224		1,223		1,232		1,223		1,223		1,223	
Nov	1,259	1,260	1,259		1,259		1,261		1,260		1,259		1,259	
Dec	1,248	1,249	1,250		1,250		1,249		1,250		1,250		1,249	
Average	1,212	1,214	1,218		1,218		1,219		1,218		1,216		1,215	
Change in Surface Area Compared to No Action [acres (%)]														
Jan	---	---	1	(0.1)	2	(0.1)	2	(0.1)	1	(0.1)	1	(0.1)	0	(0.0)
Feb	---	---	10	(0.8)	11	(0.9)	6	(0.5)	10	(0.8)	6	(0.5)	5	(0.4)
Mar	---	---	14	(1.2)	14	(1.2)	9	(0.8)	14	(1.2)	7	(0.6)	7	(0.6)
Apr	---	---	14	(1.3)	15	(1.3)	11	(0.9)	14	(1.3)	8	(0.7)	6	(0.5)
May	---	---	12	(1.0)	7	(0.6)	15	(1.2)	12	(1.0)	7	(0.6)	2	(0.1)
Jun	---	---	-1	(-0.1)	-1	(-0.1)	1	(0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)
Jul	---	---	1	(0.1)	1	(0.1)	1	(0.1)	1	(0.1)	1	(0.1)	1	(0.1)
Aug	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---	-4	(-0.3)	-4	(-0.3)	1	(0.1)	-4	(-0.3)	-4	(-0.3)	-4	(-0.3)
Oct	---	---	-4	(-0.3)	-4	(-0.3)	4	(0.4)	-4	(-0.3)	-4	(-0.3)	-4	(-0.3)
Nov	---	---	-1	(0.0)	-1	(0.0)	1	(0.0)	-1	(0.0)	-1	(0.0)	-1	(0.0)
Dec	---	---	1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	1	(0.1)
Average	---	---	4	(0.3)	3	(0.3)	4	(0.3)	4	(0.3)	2	(0.1)	1	(0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]														
Jan	---	---	4	(0.3)	4	(0.4)	4	(0.3)	4	(0.3)	4	(0.3)	2	(0.2)
Feb	---	---	13	(1.1)	14	(1.1)	9	(0.8)	13	(1.1)	9	(0.8)	8	(0.7)
Mar	---	---	17	(1.4)	17	(1.5)	12	(1.0)	17	(1.4)	10	(0.9)	10	(0.9)
Apr	---	---	11	(1.0)	12	(1.0)	8	(0.7)	11	(1.0)	5	(0.5)	3	(0.3)
May	---	---	9	(0.8)	5	(0.4)	13	(1.0)	10	(0.8)	5	(0.4)	-1	(-0.1)
Jun	---	---	0	(0.0)	0	(0.0)	2	(0.2)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---	0	(0.0)	0	(0.0)	1	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---	3	(0.3)	3	(0.2)	8	(0.7)	3	(0.3)	3	(0.3)	3	(0.2)
Oct	---	---	14	(1.1)	13	(1.1)	21	(1.8)	13	(1.1)	13	(1.1)	13	(1.1)
Nov	---	---	1	(0.0)	1	(0.0)	2	(0.1)	1	(0.1)	1	(0.0)	1	(0.0)
Dec	---	---	2	(0.1)	2	(0.1)	1	(0.1)	2	(0.1)	1	(0.1)	1	(0.1)
Average	---	---	6	(0.5)	6	(0.5)	7	(0.5)	6	(0.5)	4	(0.4)	3	(0.3)

Table 244. Monthly Surface Area Dry Year (2004) – Lake Henry (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	1,054	1,066		1,138		1,138		1,133		1,138		1,102		1,114	
Feb	1,073	1,090		1,170		1,170		1,156		1,170		1,126		1,140	
Mar	1,190	1,201		1,221		1,222		1,223		1,220		1,215		1,222	
Apr	1,206	1,202		1,203		1,202		1,208		1,203		1,204		1,205	
May	1,251	1,250		1,244		1,243		1,245		1,244		1,247		1,250	
Jun	1,234	1,227		1,228		1,232		1,202		1,229		1,234		1,230	
Jul	1,245	1,244		1,243		1,243		1,243		1,243		1,244		1,244	
Aug	1,216	1,216		1,216		1,216		1,217		1,216		1,216		1,215	
Sep	1,235	1,235		1,235		1,236		1,236		1,235		1,237		1,232	
Oct	1,172	1,170		1,163		1,163		1,169		1,163		1,165		1,166	
Nov	1,151	1,155		1,140		1,140		1,156		1,140		1,141		1,140	
Dec	1,136	1,140		1,127		1,126		1,141		1,126		1,127		1,127	
Average	1,180	1,183		1,194		1,194		1,194		1,194		1,188		1,190	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		72	(6.7)	72	(6.7)	67	(6.3)	72	(6.8)	36	(3.4)	48	(4.5)
Feb	---	---		80	(7.3)	80	(7.3)	66	(6.1)	80	(7.4)	37	(3.4)	50	(4.6)
Mar	---	---		20	(1.6)	21	(1.8)	22	(1.8)	19	(1.6)	14	(1.2)	21	(1.7)
Apr	---	---		1	(0.1)	1	(0.0)	6	(0.5)	1	(0.1)	2	(0.1)	4	(0.3)
May	---	---		-6	(-0.5)	-7	(-0.5)	-5	(-0.4)	-6	(-0.5)	-3	(-0.2)	0	(0.0)
Jun	---	---		1	(0.1)	5	(0.4)	-25	(-2.1)	2	(0.2)	7	(0.6)	3	(0.3)
Jul	---	---		-1	(-0.1)	-1	(0.0)	-1	(-0.1)	-1	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		1	(0.0)	1	(0.0)	2	(0.2)	1	(0.0)	1	(0.1)	-1	(-0.1)
Sep	---	---		0	(0.0)	0	(0.0)	1	(0.1)	-1	(0.0)	1	(0.1)	-3	(-0.3)
Oct	---	---		-7	(-0.6)	-7	(-0.6)	-1	(-0.1)	-8	(-0.6)	-5	(-0.4)	-4	(-0.4)
Nov	---	---		-15	(-1.3)	-15	(-1.3)	1	(0.1)	-15	(-1.3)	-15	(-1.3)	-15	(-1.3)
Dec	---	---		-14	(-1.2)	-14	(-1.2)	1	(0.0)	-14	(-1.2)	-13	(-1.2)	-13	(-1.1)
Average	---	---		11	(0.9)	11	(1.0)	11	(0.9)	11	(0.9)	5	(0.4)	7	(0.6)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	12	(1.1)	84	(8.0)	84	(7.9)	79	(7.5)	84	(8.0)	48	(4.6)	60	(5.7)
Feb	---	17	(1.6)	97	(9.0)	97	(9.0)	83	(7.7)	97	(9.0)	54	(5.0)	67	(6.2)
Mar	---	11	(0.9)	31	(2.6)	32	(2.7)	33	(2.8)	30	(2.5)	25	(2.1)	32	(2.7)
Apr	---	-4	(-0.3)	-2	(-0.2)	-3	(-0.3)	2	(0.2)	-3	(-0.2)	-2	(-0.2)	0	(0.0)
May	---	-2	(-0.1)	-8	(-0.6)	-8	(-0.6)	-7	(-0.5)	-8	(-0.6)	-4	(-0.3)	-2	(-0.1)
Jun	---	-8	(-0.6)	-6	(-0.5)	-3	(-0.2)	-33	(-2.6)	-5	(-0.4)	0	(0.0)	-4	(-0.3)
Jul	---	-1	(-0.1)	-2	(-0.1)	-1	(-0.1)	-2	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)
Aug	---	-1	(-0.1)	-1	(0.0)	-1	(0.0)	1	(0.1)	0	(0.0)	0	(0.0)	-2	(-0.2)
Sep	---	1	(0.1)	1	(0.0)	1	(0.1)	2	(0.2)	0	(0.0)	2	(0.2)	-3	(-0.2)
Oct	---	-1	(-0.1)	-8	(-0.7)	-8	(-0.7)	-2	(-0.2)	-9	(-0.8)	-6	(-0.5)	-6	(-0.5)
Nov	---	5	(0.4)	-11	(-0.9)	-11	(-0.9)	5	(0.5)	-11	(-0.9)	-10	(-0.9)	-11	(-0.9)
Dec	---	4	(0.3)	-10	(-0.9)	-10	(-0.9)	4	(0.4)	-10	(-0.9)	-9	(-0.8)	-9	(-0.8)
Average	---	3	(0.2)	14	(1.2)	14	(1.2)	14	(1.2)	14	(1.2)	8	(0.7)	10	(0.9)

Table 245. Monthly Surface Area Overall Average – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,168	1,036	1,039	1,037	1,044	1,039	1,032	1,025
Feb	1,187	1,078	1,087	1,084	1,091	1,086	1,074	1,071
Mar	1,209	1,135	1,141	1,131	1,139	1,135	1,128	1,131
Apr	1,203	1,136	1,142	1,138	1,140	1,140	1,133	1,135
May	1,199	1,118	1,123	1,123	1,128	1,123	1,116	1,113
Jun	1,229	1,130	1,127	1,127	1,134	1,127	1,128	1,124
Jul	1,217	1,131	1,128	1,127	1,136	1,127	1,126	1,124
Aug	1,187	1,082	1,090	1,084	1,086	1,088	1,084	1,083
Sep	1,179	1,043	1,051	1,048	1,051	1,052	1,049	1,043
Oct	1,171	1,009	1,012	1,011	1,013	1,011	1,001	1,000
Nov	1,173	1,007	1,007	1,005	1,016	1,005	998	993
Dec	1,168	1,020	1,022	1,021	1,028	1,021	1,016	1,006
Average	1,191	1,077	1,081	1,078	1,084	1,080	1,074	1,071
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	3 (0.3)	1 (0.1)	8 (0.8)	3 (0.3)	-4 (-0.4)	-11 (-1.1)
Feb	---	---	8 (0.8)	5 (0.5)	12 (1.1)	8 (0.7)	-4 (-0.4)	-7 (-0.7)
Mar	---	---	6 (0.5)	-4 (-0.3)	4 (0.4)	0 (0.0)	-7 (-0.6)	-4 (-0.3)
Apr	---	---	6 (0.5)	2 (0.2)	4 (0.4)	5 (0.4)	-3 (-0.2)	-1 (-0.1)
May	---	---	5 (0.4)	5 (0.5)	10 (0.9)	6 (0.5)	-1 (-0.1)	-4 (-0.4)
Jun	---	---	-3 (-0.2)	-3 (-0.2)	4 (0.4)	-3 (-0.3)	-2 (-0.2)	-6 (-0.5)
Jul	---	---	-3 (-0.3)	-4 (-0.4)	5 (0.4)	-4 (-0.4)	-6 (-0.5)	-7 (-0.6)
Aug	---	---	8 (0.7)	2 (0.2)	4 (0.3)	6 (0.6)	2 (0.2)	1 (0.1)
Sep	---	---	8 (0.8)	5 (0.4)	8 (0.7)	9 (0.8)	6 (0.6)	0 (0.0)
Oct	---	---	4 (0.4)	3 (0.3)	5 (0.5)	3 (0.3)	-8 (-0.8)	-8 (-0.8)
Nov	---	---	-1 (0.0)	-2 (-0.2)	9 (0.9)	-2 (-0.2)	-9 (-0.9)	-15 (-1.4)
Dec	---	---	2 (0.2)	1 (0.0)	8 (0.8)	1 (0.1)	-4 (-0.4)	-14 (-1.4)
Average	---	---	4 (0.3)	1 (0.1)	7 (0.6)	2 (0.2)	-3 (-0.3)	-6 (-0.6)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-132 (-11.3)	-129 (-11.0)	-131 (-11.2)	-124 (-10.6)	-129 (-11.1)	-136 (-11.6)	-143 (-12.2)
Feb	---	-108 (-9.1)	-100 (-8.4)	-103 (-8.7)	-96 (-8.1)	-101 (-8.5)	-113 (-9.5)	-116 (-9.8)
Mar	---	-74 (-6.1)	-68 (-5.6)	-78 (-6.4)	-70 (-5.8)	-74 (-6.1)	-81 (-6.7)	-78 (-6.4)
Apr	---	-67 (-5.6)	-61 (-5.1)	-65 (-5.4)	-63 (-5.3)	-63 (-5.2)	-70 (-5.8)	-68 (-5.6)
May	---	-81 (-6.8)	-76 (-6.3)	-76 (-6.3)	-71 (-5.9)	-76 (-6.3)	-82 (-6.9)	-85 (-7.1)
Jun	---	-99 (-8.1)	-102 (-8.3)	-102 (-8.3)	-95 (-7.7)	-103 (-8.3)	-101 (-8.2)	-105 (-8.6)
Jul	---	-86 (-7.1)	-89 (-7.3)	-90 (-7.4)	-81 (-6.7)	-90 (-7.4)	-92 (-7.5)	-93 (-7.6)
Aug	---	-105 (-8.9)	-97 (-8.2)	-103 (-8.7)	-102 (-8.5)	-99 (-8.3)	-103 (-8.7)	-104 (-8.8)
Sep	---	-136 (-11.5)	-128 (-10.8)	-131 (-11.1)	-128 (-10.9)	-127 (-10.8)	-130 (-11.0)	-136 (-11.5)
Oct	---	-162 (-13.8)	-158 (-13.5)	-159 (-13.6)	-157 (-13.4)	-159 (-13.6)	-170 (-14.5)	-170 (-14.5)
Nov	---	-165 (-14.1)	-166 (-14.1)	-168 (-14.3)	-156 (-13.3)	-167 (-14.3)	-175 (-14.9)	-180 (-15.3)
Dec	---	-148 (-12.7)	-146 (-12.5)	-148 (-12.6)	-140 (-12.0)	-147 (-12.6)	-152 (-13.0)	-162 (-13.9)
Average	---	-114 (-9.5)	-110 (-9.2)	-113 (-9.5)	-107 (-9.0)	-111 (-9.3)	-117 (-9.8)	-120 (-10.1)

Table 246. Monthly Surface Area Normal Year (2005) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,161	852	847	847	854	847	846	847
Feb	1,268	1,030	1,064	1,063	1,067	1,063	1,028	1,030
Mar	1,229	1,263	1,259	1,263	1,263	1,262	1,264	1,261
Apr	1,193	1,250	1,246	1,257	1,255	1,254	1,253	1,245
May	1,208	1,223	1,226	1,234	1,230	1,231	1,225	1,222
Jun	1,260	1,236	1,234	1,235	1,234	1,234	1,244	1,237
Jul	1,264	1,257	1,249	1,249	1,250	1,249	1,254	1,253
Aug	1,260	1,256	1,261	1,261	1,262	1,261	1,257	1,258
Sep	1,230	1,210	1,214	1,214	1,214	1,213	1,213	1,212
Oct	1,180	1,120	1,129	1,129	1,127	1,128	1,125	1,119
Nov	1,150	949	967	968	963	961	952	946
Dec	1,137	907	926	926	921	920	909	904
Average	1,212	1,129	1,135	1,137	1,137	1,135	1,131	1,128
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-5 (-0.6)	-5 (-0.6)	2 (0.3)	-5 (-0.6)	-6 (-0.7)	-4 (-0.5)
Feb	---	---	35 (3.4)	33 (3.2)	37 (3.6)	34 (3.3)	-2 (-0.2)	0 (0.0)
Mar	---	---	-4 (-0.3)	0 (0.0)	0 (0.0)	-1 (-0.1)	1 (0.1)	-3 (-0.2)
Apr	---	---	-4 (-0.3)	7 (0.6)	5 (0.4)	4 (0.3)	3 (0.2)	-5 (-0.4)
May	---	---	3 (0.3)	11 (0.9)	8 (0.6)	8 (0.7)	2 (0.2)	-1 (-0.1)
Jun	---	---	-1 (-0.1)	-1 (-0.1)	-2 (-0.1)	-2 (-0.1)	8 (0.7)	2 (0.1)
Jul	---	---	-8 (-0.6)	-8 (-0.6)	-7 (-0.6)	-9 (-0.7)	-3 (-0.2)	-4 (-0.3)
Aug	---	---	5 (0.4)	5 (0.4)	5 (0.4)	5 (0.4)	1 (0.1)	1 (0.1)
Sep	---	---	4 (0.4)	4 (0.4)	5 (0.4)	4 (0.3)	3 (0.3)	3 (0.2)
Oct	---	---	9 (0.8)	10 (0.8)	7 (0.7)	9 (0.8)	5 (0.5)	-1 (-0.1)
Nov	---	---	19 (2.0)	19 (2.0)	14 (1.4)	12 (1.3)	3 (0.3)	-3 (-0.3)
Dec	---	---	19 (2.1)	20 (2.2)	15 (1.6)	13 (1.4)	2 (0.2)	-3 (-0.3)
Average	---	---	6 (0.5)	8 (0.7)	7 (0.7)	6 (0.5)	2 (0.1)	-2 (-0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-310 (-26.6)	-314 (-27.1)	-315 (-27.1)	-307 (-26.5)	-315 (-27.1)	-315 (-27.1)	-314 (-27.0)
Feb	---	-238 (-18.8)	-203 (-16.0)	-205 (-16.1)	-201 (-15.8)	-204 (-16.1)	-240 (-18.9)	-238 (-18.7)
Mar	---	35 (2.8)	31 (2.5)	34 (2.8)	34 (2.8)	34 (2.7)	35 (2.9)	32 (2.6)
Apr	---	57 (4.7)	53 (4.4)	64 (5.3)	61 (5.1)	61 (5.1)	60 (5.0)	51 (4.3)
May	---	15 (1.2)	18 (1.5)	26 (2.1)	22 (1.9)	23 (1.9)	17 (1.4)	14 (1.1)
Jun	---	-24 (-1.9)	-25 (-2.0)	-25 (-2.0)	-25 (-2.0)	-26 (-2.0)	-16 (-1.2)	-22 (-1.8)
Jul	---	-7 (-0.5)	-15 (-1.1)	-15 (-1.2)	-14 (-1.1)	-15 (-1.2)	-10 (-0.8)	-11 (-0.8)
Aug	---	-4 (-0.3)	1 (0.1)	1 (0.1)	2 (0.1)	1 (0.1)	-3 (-0.2)	-2 (-0.2)
Sep	---	-21 (-1.7)	-17 (-1.3)	-17 (-1.3)	-16 (-1.3)	-17 (-1.4)	-18 (-1.4)	-18 (-1.5)
Oct	---	-60 (-5.1)	-51 (-4.3)	-51 (-4.3)	-53 (-4.5)	-52 (-4.4)	-55 (-4.7)	-62 (-5.2)
Nov	---	-201 (-17.5)	-183 (-15.9)	-182 (-15.8)	-188 (-16.3)	-189 (-16.5)	-198 (-17.2)	-204 (-17.8)
Dec	---	-231 (-20.3)	-212 (-18.6)	-211 (-18.6)	-216 (-19.0)	-218 (-19.1)	-229 (-20.1)	-234 (-20.5)
Average	---	-82 (-6.8)	-76 (-6.3)	-75 (-6.2)	-75 (-6.2)	-76 (-6.3)	-81 (-6.7)	-84 (-6.9)

Table 247. Monthly Surface Area Wet Year (1997) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,189	1,178	1,166	1,166	1,152	1,166	1,167	1,167
Feb	1,179	1,169	1,158	1,157	1,144	1,158	1,158	1,166
Mar	1,156	1,134	1,128	1,125	1,111	1,126	1,125	1,172
Apr	1,122	1,071	1,072	1,067	1,046	1,067	1,068	1,115
May	1,195	1,151	1,148	1,143	1,134	1,143	1,142	1,185
Jun	1,262	1,260	1,260	1,259	1,259	1,259	1,259	1,261
Jul	1,248	1,229	1,226	1,227	1,231	1,228	1,227	1,226
Aug	1,264	1,255	1,255	1,256	1,256	1,256	1,253	1,254
Sep	1,210	1,004	1,026	1,028	1,016	1,036	1,009	1,009
Oct	1,210	876	877	877	878	880	870	872
Nov	1,259	1,052	1,025	1,028	1,053	1,029	1,043	1,042
Dec	1,248	1,133	1,108	1,111	1,134	1,112	1,124	1,123
Average	1,212	1,126	1,121	1,120	1,118	1,122	1,120	1,133
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-12 (-1.0)	-12 (-1.0)	-26 (-2.2)	-12 (-1.0)	-11 (-0.9)	-11 (-0.9)
Feb	---	---	-11 (-1.0)	-11 (-1.0)	-25 (-2.1)	-11 (-0.9)	-10 (-0.9)	-2 (-0.2)
Mar	---	---	-7 (-0.6)	-10 (-0.8)	-24 (-2.1)	-9 (-0.8)	-9 (-0.8)	37 (3.3)
Apr	---	---	1 (0.1)	-4 (-0.4)	-25 (-2.4)	-4 (-0.4)	-4 (-0.3)	44 (4.1)
May	---	---	-3 (-0.3)	-8 (-0.7)	-17 (-1.5)	-8 (-0.7)	-8 (-0.7)	34 (3.0)
Jun	---	---	0 (0.0)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	-1 (-0.1)	1 (0.1)
Jul	---	---	-2 (-0.2)	-2 (-0.2)	2 (0.1)	-1 (-0.1)	-2 (-0.1)	-3 (-0.2)
Aug	---	---	1 (0.1)	1 (0.1)	1 (0.1)	1 (0.1)	-1 (-0.1)	-1 (-0.1)
Sep	---	---	22 (2.2)	23 (2.3)	12 (1.2)	32 (3.2)	5 (0.5)	5 (0.5)
Oct	---	---	2 (0.2)	2 (0.2)	3 (0.3)	5 (0.5)	-6 (-0.6)	-4 (-0.5)
Nov	---	---	-27 (-2.5)	-24 (-2.2)	1 (0.1)	-23 (-2.1)	-9 (-0.9)	-9 (-0.9)
Dec	---	---	-25 (-2.2)	-22 (-1.9)	1 (0.1)	-21 (-1.8)	-9 (-0.8)	-10 (-0.9)
Average	---	---	-5 (-0.5)	-5 (-0.5)	-8 (-0.7)	-4 (-0.4)	-5 (-0.5)	7 (0.6)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-11 (-1.0)	-23 (-1.9)	-23 (-1.9)	-37 (-3.1)	-23 (-1.9)	-22 (-1.9)	-22 (-1.9)
Feb	---	-10 (-0.9)	-22 (-1.8)	-22 (-1.8)	-35 (-3.0)	-22 (-1.8)	-21 (-1.8)	-13 (-1.1)
Mar	---	-22 (-1.9)	-28 (-2.4)	-31 (-2.7)	-45 (-3.9)	-30 (-2.6)	-31 (-2.7)	16 (1.4)
Apr	---	-50 (-4.5)	-49 (-4.4)	-54 (-4.8)	-76 (-6.7)	-55 (-4.9)	-54 (-4.8)	-6 (-0.5)
May	---	-44 (-3.7)	-47 (-3.9)	-52 (-4.3)	-61 (-5.1)	-52 (-4.4)	-52 (-4.4)	-10 (-0.8)
Jun	---	-3 (-0.2)	-3 (-0.2)	-3 (-0.3)	-4 (-0.3)	-3 (-0.3)	-4 (-0.3)	-1 (-0.1)
Jul	---	-20 (-1.6)	-22 (-1.8)	-21 (-1.7)	-18 (-1.4)	-20 (-1.6)	-21 (-1.7)	-22 (-1.8)
Aug	---	-10 (-0.8)	-9 (-0.7)	-8 (-0.7)	-9 (-0.7)	-8 (-0.7)	-11 (-0.8)	-10 (-0.8)
Sep	---	-206 (-17.0)	-184 (-15.2)	-182 (-15.1)	-194 (-16.0)	-173 (-14.3)	-201 (-16.6)	-201 (-16.6)
Oct	---	-335 (-27.6)	-333 (-27.5)	-333 (-27.5)	-332 (-27.4)	-330 (-27.3)	-340 (-28.1)	-339 (-28.0)
Nov	---	-207.20 (-16.5)	-234.00 (-18.6)	-230.70 (-18.3)	-206.30 (-16.4)	-229.80 (-18.3)	-216.30 (-17.2)	-216.60 (-17.2)
Dec	---	-115.40 (-9.2)	-140.00 (-11.2)	-136.90 (-11.0)	-114.00 (-9.1)	-136.10 (-10.9)	-124.70 (-10.0)	-125.20 (-10.0)
Average	---	-86.03 (-7.1)	-91.13 (-7.5)	-91.48 (-7.5)	-94.18 (-7.8)	-90.22 (-7.4)	-91.44 (-7.5)	-79.16 (-6.5)

Table 248. Monthly Surface Area Dry Year (2004) – Lake Henry (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	1,054	1,107	1,151	1,154	1,134	1,149	1,103	1,112
Feb	1,073	1,226	1,236	1,237	1,234	1,236	1,225	1,227
Mar	1,190	1,260	1,257	1,257	1,260	1,256	1,257	1,253
Apr	1,206	1,242	1,242	1,241	1,242	1,241	1,241	1,239
May	1,251	1,060	1,065	1,065	1,069	1,069	1,059	1,062
Jun	1,234	919	918	918	920	918	917	916
Jul	1,245	1,098	1,093	1,091	1,098	1,084	1,060	1,084
Aug	1,216	981	970	968	1,014	965	944	953
Sep	1,235	908	913	910	950	911	901	902
Oct	1,172	854	849	849	860	849	846	851
Nov	1,151	847	839	838	849	838	838	840
Dec	1,136	842	837	837	844	837	836	838
Average	1,180	1,029	1,031	1,030	1,040	1,030	1,019	1,023
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	43 (3.9)	47 (4.2)	26 (2.4)	42 (3.8)	-4 (-0.4)	5 (0.4)
Feb	---	---	10 (0.8)	11 (0.9)	8 (0.7)	10 (0.8)	-2 (-0.1)	1 (0.0)
Mar	---	---	-4 (-0.3)	-3 (-0.3)	0 (0.0)	-4 (-0.3)	-3 (-0.3)	-7 (-0.5)
Apr	---	---	0 (0.0)	0 (0.0)	1 (0.1)	-1 (0.0)	0 (0.0)	-3 (-0.3)
May	---	---	5 (0.5)	5 (0.5)	9 (0.8)	9 (0.9)	-1 (-0.1)	2 (0.2)
Jun	---	---	-1 (-0.1)	-1 (-0.1)	1 (0.2)	-1 (-0.1)	-1 (-0.2)	-3 (-0.3)
Jul	---	---	-5 (-0.4)	-8 (-0.7)	-1 (-0.1)	-14 (-1.3)	-38 (-3.5)	-14 (-1.3)
Aug	---	---	-11 (-1.1)	-13 (-1.4)	33 (3.3)	-16 (-1.6)	-37 (-3.8)	-28 (-2.9)
Sep	---	---	6 (0.6)	3 (0.3)	43 (4.7)	3 (0.3)	-7 (-0.7)	-6 (-0.6)
Oct	---	---	-5 (-0.5)	-5 (-0.6)	7 (0.8)	-5 (-0.6)	-8 (-0.9)	-3 (-0.3)
Nov	---	---	-8 (-0.9)	-8 (-1.0)	3 (0.3)	-8 (-1.0)	-9 (-1.1)	-6 (-0.7)
Dec	---	---	-6 (-0.7)	-6 (-0.7)	1 (0.2)	-6 (-0.7)	-6 (-0.7)	-4 (-0.5)
Average	---	---	2 (0.2)	2 (0.2)	11 (1.1)	1 (0.1)	-10 (-0.9)	-6 (-0.5)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	53 (5.1)	97 (9.2)	100 (9.5)	80 (7.6)	96 (9.1)	49 (4.7)	58 (5.5)
Feb	---	153 (14.3)	163 (15.2)	164 (15.3)	161 (15.0)	163 (15.2)	152 (14.1)	154 (14.3)
Mar	---	70 (5.9)	67 (5.6)	67 (5.6)	70 (5.9)	66 (5.5)	67 (5.6)	63 (5.3)
Apr	---	36 (3.0)	36 (3.0)	36 (3.0)	37 (3.1)	36 (3.0)	36 (3.0)	33 (2.7)
May	---	-191 (-15.3)	-186 (-14.9)	-186 (-14.9)	-183 (-14.6)	-182 (-14.6)	-192 (-15.4)	-189 (-15.1)
Jun	---	-316 (-25.6)	-316 (-25.6)	-317 (-25.6)	-314 (-25.5)	-316 (-25.6)	-317 (-25.7)	-318 (-25.8)
Jul	---	-146 (-11.8)	-151 (-12.2)	-154 (-12.4)	-147 (-11.8)	-160 (-12.9)	-185 (-14.8)	-161 (-12.9)
Aug	---	-236 (-19.4)	-246 (-20.2)	-249 (-20.5)	-203 (-16.7)	-251 (-20.6)	-272 (-22.4)	-264 (-21.7)
Sep	---	-327 (-26.5)	-321 (-26.0)	-324 (-26.3)	-284 (-23.0)	-324 (-26.2)	-334 (-27.0)	-333 (-26.9)
Oct	---	-318 (-27.1)	-323 (-27.5)	-323 (-27.5)	-311 (-26.6)	-323 (-27.5)	-325 (-27.8)	-321 (-27.4)
Nov	---	-304 (-26.4)	-312 (-27.1)	-312 (-27.1)	-302 (-26.2)	-312 (-27.1)	-313 (-27.2)	-310 (-27.0)
Dec	---	-294 (-25.9)	-299 (-26.3)	-299 (-26.3)	-293 (-25.7)	-300 (-26.4)	-300 (-26.4)	-298 (-26.3)
Average	---	-152 (-12.8)	-149 (-12.7)	-150 (-12.7)	-141 (-11.9)	-151 (-12.8)	-161 (-13.7)	-157 (-13.3)

Holbrook Reservoir

Holbrook Reservoir is an off-channel irrigation supply reservoir located north of the Arkansas River near La Junta. The reservoir is filled from the Holbrook Canal which diverts off of the Arkansas River near Rocky Ford. AVC has the potential to affect Holbrook Reservoir because municipal water users in the basin, as well as Southeastern, store water related to the Restoration-of-Yield program (see Appendix D.1). These participants have an agreement with the ditch company to use excess capacity in the reservoir to temporarily store consumptive use and reusable return flows that cannot otherwise be exchanged upstream. The Daily Model simulates diversion into the reservoir by municipal entities as the “last option” for storing water that cannot be exchanged, and releases from the reservoir are made at the first available opportunity for an exchange. Therefore, in the simulated hydrology, slight differences in basin operations typically are reflected in Holbrook Reservoir before other storage locations.

Direct effects storage contents for Holbrook Reservoir are presented in Table 249 through Table 252. Most effects are negligible for this reservoir. Average annual effects at the reservoir are negligible. Some months show minor effects to average monthly streamflow. Effects are most pronounced during the typical dry year and typical normal year, when effects are moderate. One cause of the larger percent differences between the action alternatives and the No Action Alternative is the lower No Action Alternative storage contents, in which small changes in storage (i.e. 100 to 200 acre-feet) result in larger percent difference.

Cumulative effects for storage in Holbrook Reservoir are shown in Table 253 through Table 256. Cumulative effects are typically negligible, with a few scattered months during normal and dry years showing moderate effects. Cumulative effects are typically less than direct effects at the reservoir because operations between the No Action Alternative and the action alternatives is more similar in the cumulative effects analysis.

Table 249. Monthly Storage Contents Overall Average – Holbrook Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	3,700	3,600	3,700	3,700	3,700	3,700	3,700	3,700
Feb	4,400	4,300	4,400	4,400	4,400	4,400	4,300	4,300
Mar	4,700	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Apr	4,500	4,500	4,400	4,400	4,400	4,400	4,400	4,400
May	4,000	3,800	3,800	3,800	3,800	3,800	3,700	3,700
Jun	3,900	3,700	3,700	3,700	3,700	3,700	3,700	3,700
Jul	3,000	2,900	2,800	2,800	2,900	2,800	2,800	2,800
Aug	2,300	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Sep	1,900	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Oct	1,900	1,800	1,700	1,700	1,800	1,700	1,700	1,700
Nov	2,100	2,000	2,000	2,000	2,000	2,000	1,900	1,900
Dec	2,800	2,600	2,800	2,700	2,700	2,700	2,700	2,700
Average	3,300	3,100	3,100	3,100	3,100	3,100	3,100	3,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (2.8)	100 (2.8)	100 (2.8)	100 (2.8)	100 (2.8)	100 (2.8)
Feb	---	---	100 (2.3)	100 (2.3)	100 (2.3)	100 (2.3)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-2.6)	-100 (-2.6)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	-100 (-3.4)	-100 (-3.4)	0 (0.0)	-100 (-3.4)	-100 (-3.4)	-100 (-3.4)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	-100 (-5.6)	-100 (-5.6)	0 (0.0)	-100 (-5.6)	-100 (-5.6)	-100 (-5.6)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-5.0)	-100 (-5.0)
Dec	---	---	200 (7.7)	100 (3.8)	100 (3.8)	100 (3.8)	100 (3.8)	100 (3.8)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-100 (-2.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	-100 (-2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-2.3)	-100 (-2.3)
Mar	---	-100 (-2.1)	-100 (-2.1)	-100 (-2.1)	-100 (-2.1)	-100 (-2.1)	-100 (-2.1)	-100 (-2.1)
Apr	---	0 (0.0)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)	-100 (-2.2)
May	---	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-300 (-7.5)	-300 (-7.5)
Jun	---	-200 (-5.1)	-200 (-5.1)	-200 (-5.1)	-200 (-5.1)	-200 (-5.1)	-200 (-5.1)	-200 (-5.1)
Jul	---	-100 (-3.3)	-200 (-6.7)	-200 (-6.7)	-100 (-3.3)	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)
Aug	---	-200 (-8.7)	-200 (-8.7)	-200 (-8.7)	-200 (-8.7)	-200 (-8.7)	-200 (-8.7)	-200 (-8.7)
Sep	---	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)
Oct	---	-100 (-5.3)	-200 (-10.5)	-200 (-10.5)	-100 (-5.3)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)
Nov	---	-100 (-4.8)	-100 (-4.8)	-100 (-4.8)	-100 (-4.8)	-100 (-4.8)	-200 (-9.5)	-200 (-9.5)
Dec	---	-200 (-7.1)	0 (0.0)	-100 (-3.6)	-100 (-3.6)	-100 (-3.6)	-100 (-3.6)	-100 (-3.6)
Average	---	-200 (-6.1)	-200 (-6.1)	-200 (-6.1)	-200 (-6.1)	-200 (-6.1)	-200 (-6.1)	-200 (-6.1)

Table 250. Monthly Storage Contents Normal Year (2005) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	1,600	1,600	1,700	1,700	1,600	1,600	1,600	1,600
Feb	2,300	2,100	2,200	2,200	2,200	2,200	2,100	2,100
Mar	2,700	2,800	2,800	2,800	2,800	2,800	2,700	2,700
Apr	3,100	3,600	3,400	3,400	3,600	3,400	3,400	3,400
May	2,900	2,000	2,200	2,300	2,100	2,200	1,900	2,000
Jun	2,200	900	700	700	900	700	600	600
Jul	1,700	500	200	200	500	200	200	200
Aug	1,800	300	100	100	300	100	100	100
Sep	2,500	700	500	500	700	500	500	500
Oct	3,400	1,200	1,000	1,000	1,200	1,000	900	1,000
Nov	3,400	1,100	900	900	1,100	900	900	900
Dec	3,200	700	800	800	900	800	600	700
Average	2,600	1,400	1,400	1,400	1,500	1,400	1,300	1,300
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (6.3)	100 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	100 (4.8)	100 (4.8)	100 (4.8)	100 (4.8)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-3.6)	-100 (-3.6)
Apr	---	---	-200 (-5.6)	-200 (-5.6)	0 (0.0)	-200 (-5.6)	-200 (-5.6)	-200 (-5.6)
May	---	---	200 (10.0)	300 (15.0)	100 (5.0)	200 (10.0)	-100 (-5.0)	0 (0.0)
Jun	---	---	-200 (-22.2)	-200 (-22.2)	0 (0.0)	-200 (-22.2)	-300 (-33.3)	-300 (-33.3)
Jul	---	---	-300 (-60.0)	-300 (-60.0)	0 (0.0)	-300 (-60.0)	-300 (-60.0)	-300 (-60.0)
Aug	---	---	-200 (-66.7)	-200 (-66.7)	0 (0.0)	-200 (-66.7)	-200 (-66.7)	-200 (-66.7)
Sep	---	---	-200 (-28.6)	-200 (-28.6)	0 (0.0)	-200 (-28.6)	-200 (-28.6)	-200 (-28.6)
Oct	---	---	-200 (-16.7)	-200 (-16.7)	0 (0.0)	-200 (-16.7)	-300 (-25.0)	-200 (-16.7)
Nov	---	---	-200 (-18.2)	-200 (-18.2)	0 (0.0)	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)
Dec	---	---	100 (14.3)	100 (14.3)	200 (28.6)	100 (14.3)	-100 (-14.3)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	100 (7.1)	0 (0.0)	-100 (-7.1)	-100 (-7.1)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	0 (0.0)	100 (6.3)	100 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	-200 (-8.7)	-100 (-4.3)	-100 (-4.3)	-100 (-4.3)	-100 (-4.3)	-200 (-8.7)	-200 (-8.7)
Mar	---	100 (3.7)	100 (3.7)	100 (3.7)	100 (3.7)	100 (3.7)	0 (0.0)	0 (0.0)
Apr	---	500 (16.1)	300 (9.7)	300 (9.7)	500 (16.1)	300 (9.7)	300 (9.7)	300 (9.7)
May	---	-900 (-31.0)	-700 (-24.1)	-600 (-20.7)	-800 (-27.6)	-700 (-24.1)	-1,000 (-34.5)	-900 (-31.0)
Jun	---	-1,300 (-59.1)	-1,500 (-68.2)	-1,500 (-68.2)	-1,300 (-59.1)	-1,500 (-68.2)	-1,600 (-72.7)	-1,600 (-72.7)
Jul	---	-1,200 (-70.6)	-1,500 (-88.2)	-1,500 (-88.2)	-1,200 (-70.6)	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)
Aug	---	-1,500 (-83.3)	-1,700 (-94.4)	-1,700 (-94.4)	-1,500 (-83.3)	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)
Sep	---	-1,800 (-72.0)	-2,000 (-80.0)	-2,000 (-80.0)	-1,800 (-72.0)	-2,000 (-80.0)	-2,000 (-80.0)	-2,000 (-80.0)
Oct	---	-2,200 (-64.7)	-2,400 (-70.6)	-2,400 (-70.6)	-2,200 (-64.7)	-2,400 (-70.6)	-2,500 (-73.5)	-2,400 (-70.6)
Nov	---	-2,300 (-67.6)	-2,500 (-73.5)	-2,500 (-73.5)	-2,300 (-67.6)	-2,500 (-73.5)	-2,500 (-73.5)	-2,500 (-73.5)
Dec	---	-2,500 (-78.1)	-2,400 (-75.0)	-2,400 (-75.0)	-2,300 (-71.9)	-2,400 (-75.0)	-2,600 (-81.3)	-2,500 (-78.1)
Average	---	-1,200 (-46.2)	-1,200 (-46.2)	-1,200 (-46.2)	-1,100 (-42.3)	-1,200 (-46.2)	-1,300 (-50.0)	-1,300 (-50.0)

Table 251. Monthly Storage Contents Wet Year (1997) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Contents (ac-ft)															
Jan	5,200	5,300		5,500		5,500		5,500		5,500		5,400		5,500	
Feb	5,500	5,500		5,700		5,700		5,600		5,700		5,700		5,700	
Mar	5,400	5,400		5,500		5,500		5,500		5,500		5,500		5,500	
Apr	5,700	5,700		5,600		5,600		5,700		5,600		5,600		5,600	
May	6,300	6,300		6,300		6,300		6,300		6,300		6,300		6,300	
Jun	6,300	6,300		6,300		6,300		6,300		6,300		6,300		6,300	
Jul	6,000	6,000		6,000		6,000		6,000		6,000		6,000		6,000	
Aug	6,000	6,000		6,000		6,000		6,000		6,000		6,000		6,000	
Sep	3,500	3,500		3,500		3,500		3,500		3,500		3,500		3,500	
Oct	1,700	1,700		1,600		1,600		1,700		1,600		1,600		1,600	
Nov	2,000	2,000		1,900		1,900		2,000		1,900		1,900		1,900	
Dec	4,900	4,900		4,900		4,900		4,900		4,900		4,900		4,900	
Average	4,900	4,900		4,900		4,900		4,900		4,900		4,900		4,900	
Change in Contents Compared to No Action [ac-ft (%)]															
Jan	---	---		200	(3.8)	200	(3.8)	200	(3.8)	200	(3.8)	100	(1.9)	200	(3.8)
Feb	---	---		200	(3.6)	200	(3.6)	100	(1.8)	200	(3.6)	200	(3.6)	200	(3.6)
Mar	---	---		100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)
Apr	---	---		-100	(-1.8)	-100	(-1.8)	0	(0.0)	-100	(-1.8)	-100	(-1.8)	-100	(-1.8)
May	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		-100	(-5.9)	-100	(-5.9)	0	(0.0)	-100	(-5.9)	-100	(-5.9)	-100	(-5.9)
Nov	---	---		-100	(-5.0)	-100	(-5.0)	0	(0.0)	-100	(-5.0)	-100	(-5.0)	-100	(-5.0)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]															
Jan	---	100	(1.9)	300	(5.8)	300	(5.8)	300	(5.8)	300	(5.8)	200	(3.8)	300	(5.8)
Feb	---	0	(0.0)	200	(3.6)	200	(3.6)	100	(1.8)	200	(3.6)	200	(3.6)	200	(3.6)
Mar	---	0	(0.0)	100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)	100	(1.9)
Apr	---	0	(0.0)	-100	(-1.8)	-100	(-1.8)	0	(0.0)	-100	(-1.8)	-100	(-1.8)	-100	(-1.8)
May	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	0	(0.0)	-100	(-5.9)	-100	(-5.9)	0	(0.0)	-100	(-5.9)	-100	(-5.9)	-100	(-5.9)
Nov	---	0	(0.0)	-100	(-5.0)	-100	(-5.0)	0	(0.0)	-100	(-5.0)	-100	(-5.0)	-100	(-5.0)
Dec	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)

Table 252. Monthly Storage Contents Dry Year (2004) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	1,900	3,400	3,500	3,500	3,400	3,500	3,500	3,500
Feb	2,100	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Mar	2,100	3,400	3,400	3,400	3,400	3,400	3,400	3,400
Apr	2,300	3,000	3,100	3,100	3,000	3,000	2,900	2,800
May	1,400	900	700	700	900	700	600	700
Jun	900	1,000	700	700	1,000	700	700	700
Jul	1,000	1,000	800	800	1,000	800	800	800
Aug	1,100	1,000	800	800	1,000	900	800	800
Sep	1,300	1,200	1,100	1,100	1,200	1,100	1,000	1,100
Oct	1,200	1,300	1,100	1,100	1,300	1,100	1,000	1,000
Nov	1,300	1,400	1,200	1,200	1,400	1,200	1,200	1,200
Dec	1,500	1,500	1,600	1,600	1,500	1,500	1,500	1,500
Average	1,500	1,900	1,800	1,800	1,900	1,800	1,700	1,700
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (2.9)	100 (2.9)	0 (0.0)	100 (2.9)	100 (2.9)	100 (2.9)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	100 (3.3)	100 (3.3)	0 (0.0)	0 (0.0)	-100 (-3.3)	-200 (-6.7)
May	---	---	-200 (-22.2)	-200 (-22.2)	0 (0.0)	-200 (-22.2)	-300 (-33.3)	-200 (-22.2)
Jun	---	---	-300 (-30.0)	-300 (-30.0)	0 (0.0)	-300 (-30.0)	-300 (-30.0)	-300 (-30.0)
Jul	---	---	-200 (-20.0)	-200 (-20.0)	0 (0.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)
Aug	---	---	-200 (-20.0)	-200 (-20.0)	0 (0.0)	-100 (-10.0)	-200 (-20.0)	-200 (-20.0)
Sep	---	---	-100 (-8.3)	-100 (-8.3)	0 (0.0)	-100 (-8.3)	-200 (-16.7)	-100 (-8.3)
Oct	---	---	-200 (-15.4)	-200 (-15.4)	0 (0.0)	-200 (-15.4)	-300 (-23.1)	-300 (-23.1)
Nov	---	---	-200 (-14.3)	-200 (-14.3)	0 (0.0)	-200 (-14.3)	-200 (-14.3)	-200 (-14.3)
Dec	---	---	100 (6.7)	100 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	-100 (-5.3)	-100 (-5.3)	0 (0.0)	-100 (-5.3)	-200 (-10.5)	-200 (-10.5)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	1,500 (78.9)	1,600 (84.2)	1,600 (84.2)	1,500 (78.9)	1,600 (84.2)	1,600 (84.2)	1,600 (84.2)
Feb	---	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)
Mar	---	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)
Apr	---	700 (30.4)	800 (34.8)	800 (34.8)	700 (30.4)	700 (30.4)	600 (26.1)	500 (21.7)
May	---	-500 (-35.7)	-700 (-50.0)	-700 (-50.0)	-500 (-35.7)	-700 (-50.0)	-800 (-57.1)	-700 (-50.0)
Jun	---	100 (11.1)	-200 (-22.2)	-200 (-22.2)	100 (11.1)	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)
Jul	---	0 (0.0)	-200 (-20.0)	-200 (-20.0)	0 (0.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)
Aug	---	-100 (-9.1)	-300 (-27.3)	-300 (-27.3)	-100 (-9.1)	-200 (-18.2)	-300 (-27.3)	-300 (-27.3)
Sep	---	-100 (-7.7)	-200 (-15.4)	-200 (-15.4)	-100 (-7.7)	-200 (-15.4)	-300 (-23.1)	-200 (-15.4)
Oct	---	100 (8.3)	-100 (-8.3)	-100 (-8.3)	100 (8.3)	-100 (-8.3)	-200 (-16.7)	-200 (-16.7)
Nov	---	100 (7.7)	-100 (-7.7)	-100 (-7.7)	100 (7.7)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)
Dec	---	0 (0.0)	100 (6.7)	100 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	400 (26.7)	300 (20.0)	300 (20.0)	400 (26.7)	300 (20.0)	200 (13.3)	200 (13.3)

Table 253. Monthly Storage Contents Overall Average – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	3,700	3,100	3,100	3,100	3,100	3,100	3,100	3,100
Feb	4,400	3,900	4,000	4,000	4,000	4,000	3,900	3,900
Mar	4,700	4,400	4,400	4,400	4,400	4,400	4,400	4,400
Apr	4,500	4,300	4,400	4,400	4,300	4,400	4,300	4,300
May	4,000	3,800	3,800	3,800	3,800	3,800	3,800	3,800
Jun	3,900	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Jul	3,000	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Aug	2,300	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Sep	1,900	1,600	1,700	1,700	1,700	1,700	1,600	1,600
Oct	1,900	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Nov	2,100	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Dec	2,800	2,200	2,300	2,300	2,200	2,300	2,200	2,200
Average	3,300	2,900	2,900	2,900	2,900	2,900	2,900	2,900
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	100 (2.6)	100 (2.6)	100 (2.6)	100 (2.6)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	100 (2.3)	100 (2.3)	0 (0.0)	100 (2.3)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	100 (6.3)	100 (6.3)	100 (6.3)	100 (6.3)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	100 (4.5)	100 (4.5)	0 (0.0)	100 (4.5)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-600 (-16.2)	-600 (-16.2)	-600 (-16.2)	-600 (-16.2)	-600 (-16.2)	-600 (-16.2)	-600 (-16.2)
Feb	---	-500 (-11.4)	-400 (-9.1)	-400 (-9.1)	-400 (-9.1)	-400 (-9.1)	-500 (-11.4)	-500 (-11.4)
Mar	---	-300 (-6.4)	-300 (-6.4)	-300 (-6.4)	-300 (-6.4)	-300 (-6.4)	-300 (-6.4)	-300 (-6.4)
Apr	---	-200 (-4.4)	-100 (-2.2)	-100 (-2.2)	-200 (-4.4)	-100 (-2.2)	-200 (-4.4)	-200 (-4.4)
May	---	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)	-200 (-5.0)
Jun	---	-300 (-7.7)	-300 (-7.7)	-300 (-7.7)	-300 (-7.7)	-300 (-7.7)	-300 (-7.7)	-300 (-7.7)
Jul	---	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)	-200 (-6.7)
Aug	---	-300 (-13.0)	-300 (-13.0)	-300 (-13.0)	-300 (-13.0)	-300 (-13.0)	-300 (-13.0)	-300 (-13.0)
Sep	---	-300 (-15.8)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-200 (-10.5)	-300 (-15.8)	-300 (-15.8)
Oct	---	-400 (-21.1)	-400 (-21.1)	-400 (-21.1)	-400 (-21.1)	-400 (-21.1)	-400 (-21.1)	-400 (-21.1)
Nov	---	-500 (-23.8)	-500 (-23.8)	-500 (-23.8)	-500 (-23.8)	-500 (-23.8)	-500 (-23.8)	-500 (-23.8)
Dec	---	-600 (-21.4)	-500 (-17.9)	-500 (-17.9)	-600 (-21.4)	-500 (-17.9)	-600 (-21.4)	-600 (-21.4)
Average	---	-400 (-12.1)	-400 (-12.1)	-400 (-12.1)	-400 (-12.1)	-400 (-12.1)	-400 (-12.1)	-400 (-12.1)

Table 254. Monthly Storage Contents Normal Year (2005) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	1,600	1,500	1,600	1,600	1,600	1,500	1,500	1,500
Feb	2,300	2,900	3,600	3,600	3,600	3,600	2,500	2,700
Mar	2,700	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Apr	3,100	3,700	3,700	3,700	3,700	3,700	3,700	3,700
May	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
Jun	2,200	600	600	600	600	600	600	600
Jul	1,700	200	200	200	200	200	200	200
Aug	1,800	100	100	100	100	100	100	100
Sep	2,500	600	600	600	600	600	600	600
Oct	3,400	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Nov	3,400	1,000	900	900	1,000	900	900	1,000
Dec	3,200	600	600	600	600	600	600	600
Average	2,600	1,500	1,600	1,600	1,600	1,600	1,500	1,500
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	100 (6.7)	100 (6.7)	100 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	700 (24.1)	700 (24.1)	700 (24.1)	700 (24.1)	-400 (-13.8)	-200 (-6.9)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	-100 (-10.0)	-100 (-10.0)	0 (0.0)	-100 (-10.0)	-100 (-10.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	100 (6.7)	100 (6.7)	100 (6.7)	100 (6.7)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-100 (-6.3)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-6.3)	-100 (-6.3)	-100 (-6.3)
Feb	---	600 (26.1)	1,300 (56.5)	1,300 (56.5)	1,300 (56.5)	1,300 (56.5)	200 (8.7)	400 (17.4)
Mar	---	900 (33.3)	900 (33.3)	900 (33.3)	900 (33.3)	900 (33.3)	900 (33.3)	900 (33.3)
Apr	---	600 (19.4)	600 (19.4)	600 (19.4)	600 (19.4)	600 (19.4)	600 (19.4)	600 (19.4)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	-1,600 (-72.7)	-1,600 (-72.7)	-1,600 (-72.7)	-1,600 (-72.7)	-1,600 (-72.7)	-1,600 (-72.7)	-1,600 (-72.7)
Jul	---	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)	-1,500 (-88.2)
Aug	---	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)	-1,700 (-94.4)
Sep	---	-1,900 (-76.0)	-1,900 (-76.0)	-1,900 (-76.0)	-1,900 (-76.0)	-1,900 (-76.0)	-1,900 (-76.0)	-1,900 (-76.0)
Oct	---	-2,400 (-70.6)	-2,400 (-70.6)	-2,400 (-70.6)	-2,400 (-70.6)	-2,400 (-70.6)	-2,400 (-70.6)	-2,400 (-70.6)
Nov	---	-2,400 (-70.6)	-2,500 (-73.5)	-2,500 (-73.5)	-2,400 (-70.6)	-2,500 (-73.5)	-2,500 (-73.5)	-2,400 (-70.6)
Dec	---	-2,600 (-81.3)	-2,600 (-81.3)	-2,600 (-81.3)	-2,600 (-81.3)	-2,600 (-81.3)	-2,600 (-81.3)	-2,600 (-81.3)
Average	---	-1,100 (-42.3)	-1,000 (-38.5)	-1,000 (-38.5)	-1,000 (-38.5)	-1,000 (-38.5)	-1,100 (-42.3)	-1,100 (-42.3)

Table 255. Monthly Storage Contents Wet Year (1997) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	5,200	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Feb	5,500	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Mar	5,400	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Apr	5,700	5,600	5,600	5,600	5,600	5,600	5,600	5,600
May	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
Jun	6,300	6,300	6,300	6,300	6,300	6,300	6,300	6,300
Jul	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Aug	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Sep	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Oct	1,700	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Nov	2,000	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Dec	4,900	4,800	4,800	4,800	4,800	4,800	4,800	4,800
Average	4,900	4,800	4,800	4,800	4,800	4,800	4,800	4,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-200 (-3.8)	-200 (-3.8)	-200 (-3.8)	-200 (-3.8)	-200 (-3.8)	-200 (-3.8)	-200 (-3.8)
Feb	---	-300 (-5.5)	-300 (-5.5)	-300 (-5.5)	-300 (-5.5)	-300 (-5.5)	-300 (-5.5)	-300 (-5.5)
Mar	---	-200 (-3.7)	-200 (-3.7)	-200 (-3.7)	-200 (-3.7)	-200 (-3.7)	-200 (-3.7)	-200 (-3.7)
Apr	---	-100 (-1.8)	-100 (-1.8)	-100 (-1.8)	-100 (-1.8)	-100 (-1.8)	-100 (-1.8)	-100 (-1.8)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	-100 (-5.9)	-100 (-5.9)	-100 (-5.9)	-100 (-5.9)	-100 (-5.9)	-100 (-5.9)	-100 (-5.9)
Nov	---	-200 (-10.0)	-200 (-10.0)	-200 (-10.0)	-200 (-10.0)	-200 (-10.0)	-200 (-10.0)	-200 (-10.0)
Dec	---	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)
Average	---	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)	-100 (-2.0)

Table 256. Monthly Storage Contents Dry Year (2004) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	1,900	3,400	3,400	3,400	3,400	3,400	3,400	3,400
Feb	2,100	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Mar	2,100	3,400	3,400	3,400	3,400	3,400	3,400	3,400
Apr	2,300	3,200	3,200	3,200	3,200	3,200	3,200	3,200
May	1,400	2,600	2,600	2,600	2,600	2,600	2,200	2,700
Jun	900	700	700	700	700	700	700	700
Jul	1,000	800	800	800	800	800	800	800
Aug	1,100	900	900	900	900	900	900	900
Sep	1,300	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Oct	1,200	1,000	1,000	1,000	1,000	1,100	1,000	1,000
Nov	1,300	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Dec	1,500	1,400	1,400	1,400	1,400	1,400	1,400	1,400
Average	1,500	1,900	1,900	1,900	1,900	1,900	1,900	1,900
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-400 (-15.4)	100 (3.8)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	100 (10.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	1,500 (78.9)	1,500 (78.9)	1,500 (78.9)	1,500 (78.9)	1,500 (78.9)	1,500 (78.9)	1,500 (78.9)
Feb	---	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)	1,400 (66.7)
Mar	---	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)	1,300 (61.9)
Apr	---	900 (39.1)	900 (39.1)	900 (39.1)	900 (39.1)	900 (39.1)	900 (39.1)	900 (39.1)
May	---	1,200 (85.7)	1,200 (85.7)	1,200 (85.7)	1,200 (85.7)	1,200 (85.7)	800 (57.1)	1,300 (92.9)
Jun	---	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)	-200 (-22.2)
Jul	---	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)	-200 (-20.0)
Aug	---	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)	-200 (-18.2)
Sep	---	-300 (-23.1)	-300 (-23.1)	-300 (-23.1)	-300 (-23.1)	-300 (-23.1)	-300 (-23.1)	-300 (-23.1)
Oct	---	-200 (-16.7)	-200 (-16.7)	-200 (-16.7)	-200 (-16.7)	-100 (-8.3)	-200 (-16.7)	-200 (-16.7)
Nov	---	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)	-100 (-7.7)
Dec	---	-100 (-6.7)	-100 (-6.7)	-100 (-6.7)	-100 (-6.7)	-100 (-6.7)	-100 (-6.7)	-100 (-6.7)
Average	---	400 (26.7)	400 (26.7)	400 (26.7)	400 (26.7)	400 (26.7)	400 (26.7)	400 (26.7)

A time-series plot of simulated storage contents for each of the alternatives is shown in Figure 34. All alternatives follow the same general pattern of annual drawdown's and annual filling.

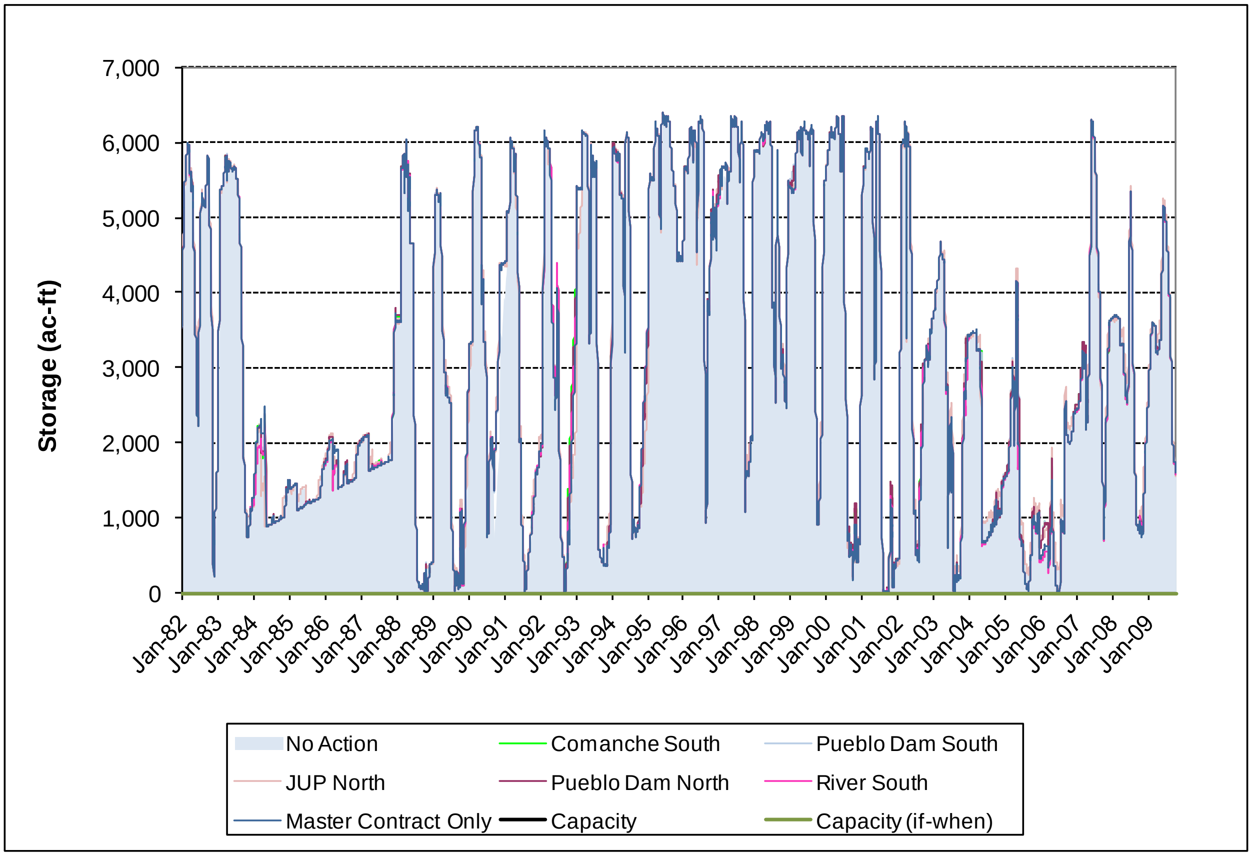

Figure 34. Storage Time Series Analysis – Holbrook Reservoir (Direct Effects).

The monthly summary tables show substantial changes in the simulated existing conditions and alternative Holbrook Reservoir storage contents, particularly during normal and dry years. Time-series summaries of the daily simulated storage contents in Holbrook Reservoir for normal and dry years are presented in Figure 35 and Figure 36, respectively. The differences in storage between existing conditions and the alternatives is a result of the use of Fry-Ark allocations by the AVC participants in the direct effects runs. In the existing conditions run, demands for the entities east of Pueblo Fry-Ark allocation by AVC participants are much less than the direct effects runs, which use 2060 demand for AVC participants. In the existing condition run, some of the Fry-Ark allocation not used by AVC participants is "reallocated" to the Fountain Valley Authority entities, whereas in the direct effects runs, this water is not reallocated to Fountain Valley Authority entities. This results in higher storage in the Fountain Valley Authority Fry-Ark carryover storage space for the existing conditions run, especially following wet periods, such as the late 1990's.

Colorado Springs Utilities demands through the Fountain Valley Conduit are the same for both existing conditions and the direct effects runs. As the Fry-Ark carryover storage is exhausted during drier periods such as the early 2000's in the direct effects runs, the Colorado Springs demand begins using storage from their excess capacity storage account through the Fountain

Valley Conduit. This results in generally lower storage in Colorado Springs excess capacity storage account during drier periods in the direct effects runs. Because of the higher storage availability in its excess capacity storage account, Colorado Springs exchanges more water out of Holbrook Reservoir into the excess capacity account during the direct effects runs than during the existing conditions runs. Ultimately, this results in lower storage for the direct effects runs than the existing conditions runs in Holbrook Reservoir during this period.

As shown in Figure 35, all of the simulated storage contents for both the existing conditions runs and the direct effects runs are higher than the historical storage contents during 2005. No historical data is available for storage during 2004. Furthermore, as shown in Figure 37, this occurrence is unique to the early and mid-2000's period, which is a generally drier period preceded by a generally wetter period. By the late 2000's, the alternatives all generally operate consistently.

It should be noted that there are scattered periods in which no historical data is available for Holbrook Reservoir, especially during the mid 1980's. During these periods, data is interpolated between the first and last known data points, which explains why some years don't reach maximum storage contents. These approximations do not affect the analysis, as the same assumptions are made for all runs.

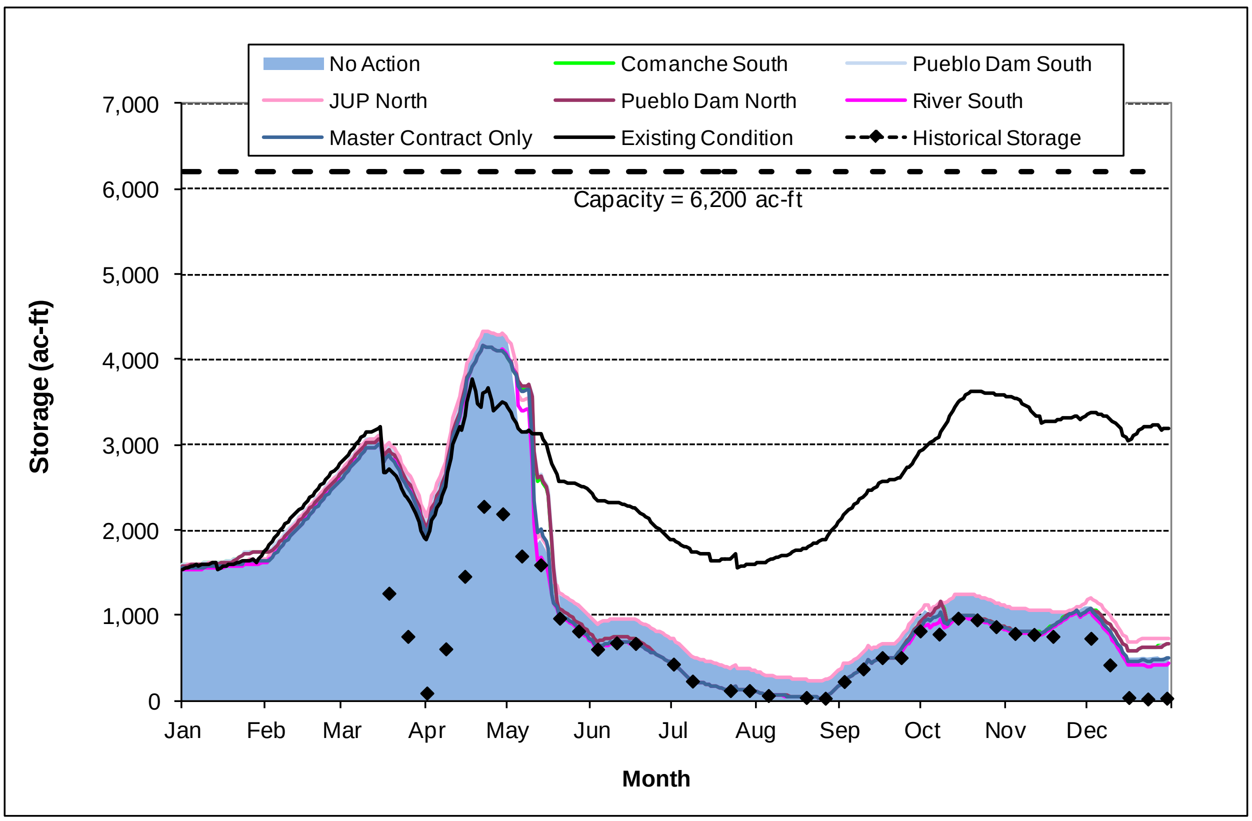

Figure 35. Storage Normal Year (2005) Time Series Analysis - Holbrook Reservoir (Direct Effects)

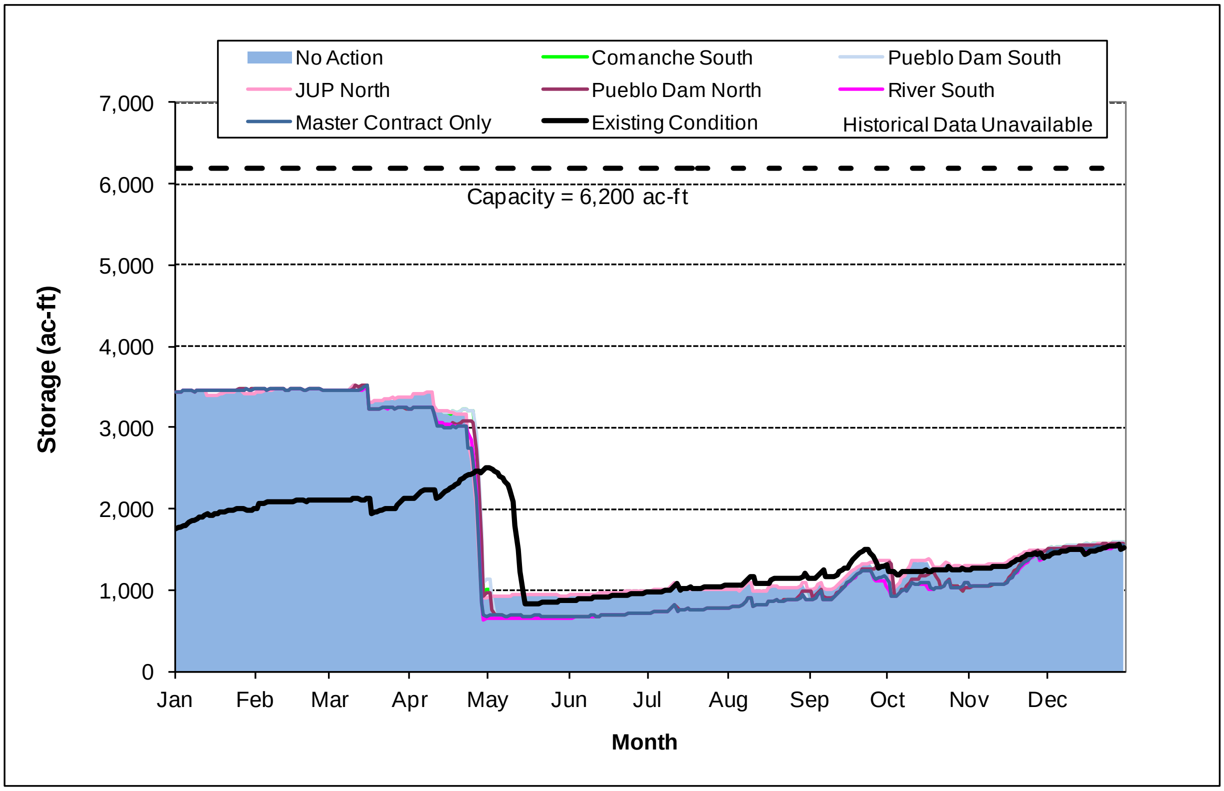

Figure 36. Storage Dry Year (2004) Time Series Analysis - Holbrook Reservoir (Direct Effects)

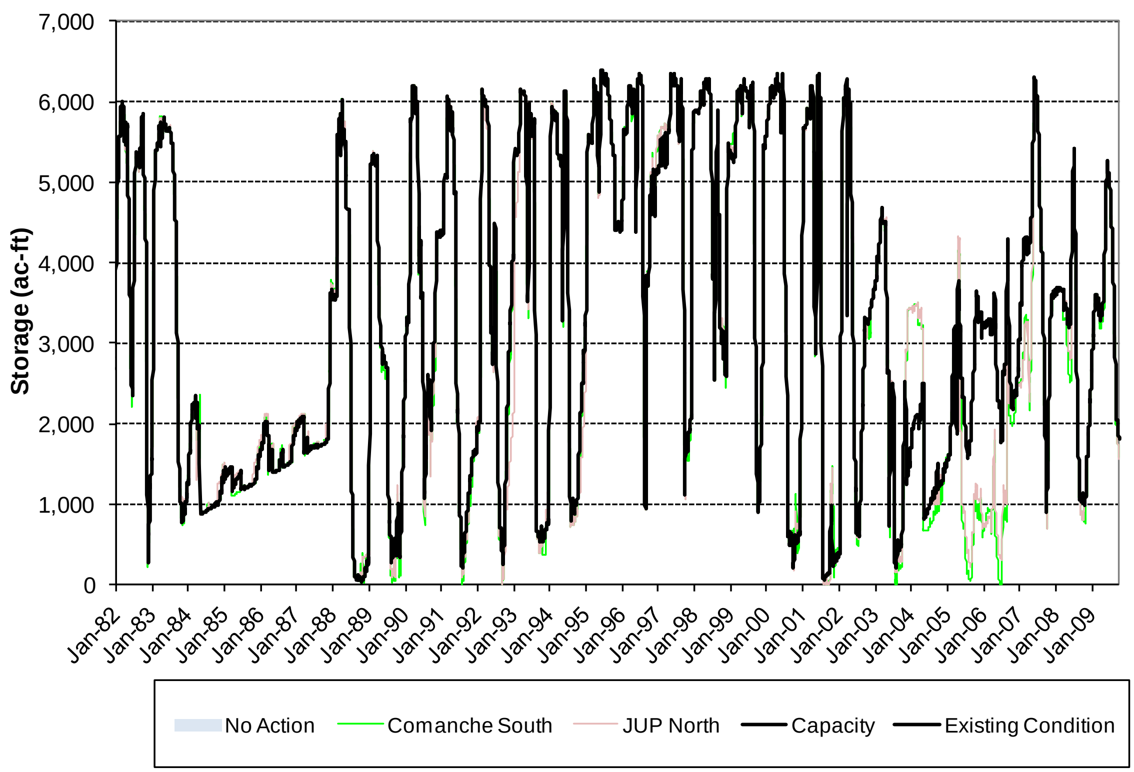

Figure 37. Storage Time Series Analysis – Holbrook Reservoir (Direct Effects) with Existing Condition Run.

A time-series plot of simulated storage contents for the Holbrook Reservoir cumulative effects analysis is shown in Figure 38.

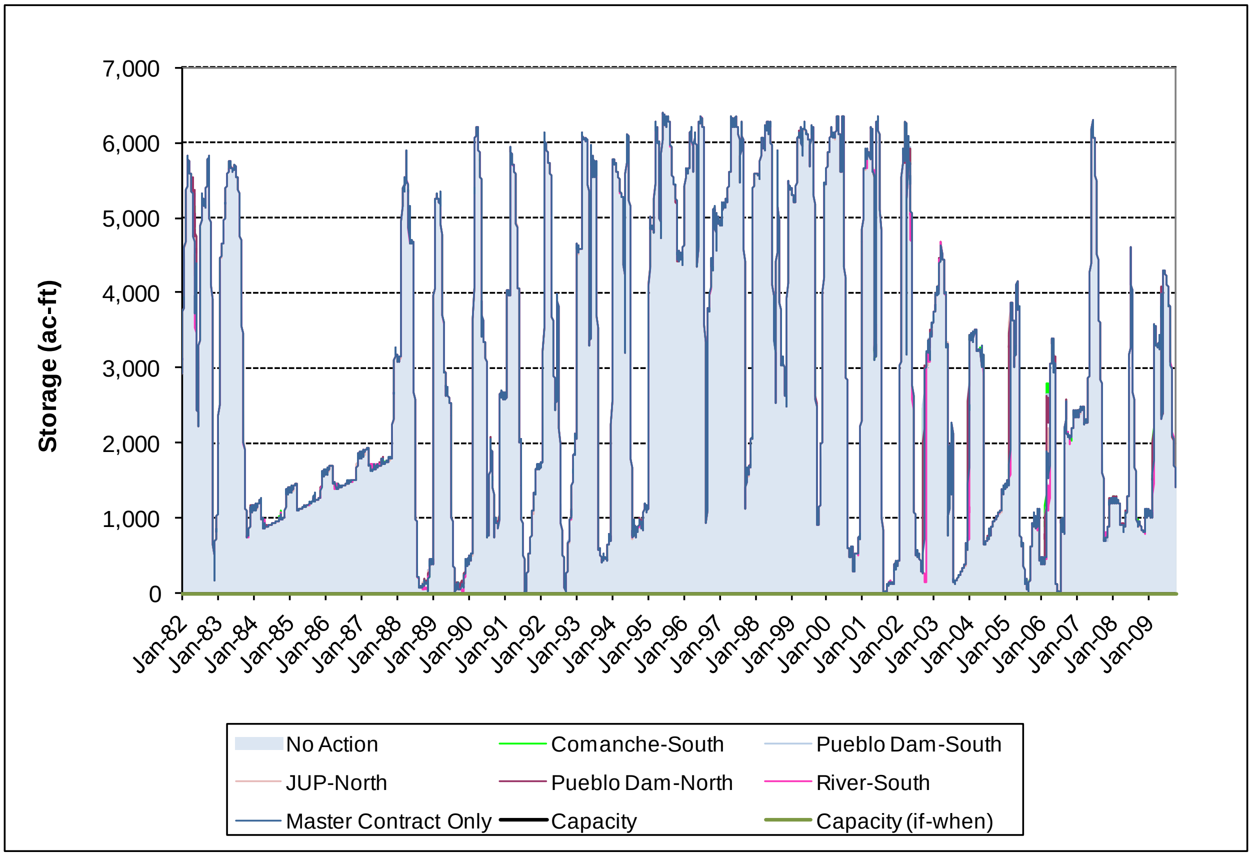

Figure 38. Storage Time Series Analysis – Holbrook Reservoir (Cumulative Effects).

Simulated water surface elevation for Holbrook Reservoir is presented in Table 257 through Table 260 for the direct effects analysis, and Table 261 through Table 264 for the cumulative effects analysis. Simulated surface area for Holbrook Reservoir is presented in Table 265 through Table 268 for the direct effects analysis, and Table 269 through Table 272 for the cumulative effects analysis.

Table 257. Monthly Water Depth Overall Average – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Depth (ft)															
Jan	14.9	14.6		14.8		14.8		14.7		14.8		14.7		14.7	
Feb	16.3	16.0		16.2		16.2		16.1		16.2		16.0		16.1	
Mar	16.7	16.4		16.5		16.5		16.5		16.5		16.4		16.4	
Apr	16.5	16.2		16.2		16.2		16.2		16.2		16.1		16.1	
May	15.3	14.8		14.7		14.7		14.8		14.7		14.6		14.6	
Jun	14.9	14.5		14.2		14.2		14.5		14.2		14.2		14.2	
Jul	12.9	12.4		12.2		12.2		12.4		12.2		12.2		12.2	
Aug	11.0	10.3		10.2		10.2		10.3		10.2		10.1		10.1	
Sep	10.2	9.4		9.4		9.4		9.5		9.4		9.4		9.4	
Oct	10.3	10.0		9.9		9.9		10.2		9.9		9.8		9.8	
Nov	10.9	10.8		10.5		10.5		10.8		10.5		10.5		10.4	
Dec	12.6	12.4		12.6		12.6		12.4		12.6		12.5		12.5	
Average	13.5	13.2		13.1		13.1		13.2		13.1		13.0		13.0	
Change in Water Depth Compared to No Action [ft (%)]															
Jan	---		---	0.2	(1.6)	0.2	(1.6)	0.1	(0.8)	0.2	(1.6)	0.1	(0.8)	0.1	(0.8)
Feb	---		---	0.2	(1.4)	0.2	(1.4)	0.1	(0.7)	0.1	(0.7)	0.0	(0.0)	0.1	(0.7)
Mar	---		---	0.1	(0.7)	0.1	(0.7)	0.1	(0.7)	0.1	(0.7)	0.0	(0.0)	0.0	(0.0)
Apr	---		---	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	-0.1	(-0.7)	-0.1	(-0.7)
May	---		---	-0.1	(-0.8)	-0.1	(-0.8)	0.0	(0.0)	-0.2	(-1.6)	-0.2	(-1.6)	-0.2	(-1.6)
Jun	---		---	-0.3	(-2.4)	-0.3	(-2.4)	0.0	(0.0)	-0.3	(-2.4)	-0.3	(-2.4)	-0.3	(-2.4)
Jul	---		---	-0.2	(-1.9)	-0.2	(-1.9)	0.0	(0.0)	-0.2	(-1.9)	-0.2	(-1.9)	-0.2	(-1.9)
Aug	---		---	-0.1	(-1.2)	-0.1	(-1.2)	0.0	(0.0)	-0.1	(-1.2)	-0.2	(-2.4)	-0.2	(-2.4)
Sep	---		---	0.0	(0.0)	0.0	(0.0)	0.1	(1.4)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Oct	---		---	-0.1	(-1.3)	-0.1	(-1.3)	0.1	(1.3)	-0.1	(-1.3)	-0.2	(-2.5)	-0.2	(-2.5)
Nov	---		---	-0.3	(-3.4)	-0.3	(-3.4)	0.0	(0.0)	-0.3	(-3.4)	-0.3	(-3.4)	-0.4	(-4.5)
Dec	---		---	0.3	(2.9)	0.3	(2.9)	0.1	(1.0)	0.3	(2.9)	0.2	(1.9)	0.2	(1.9)
Average	---		---	0.0	(-0.2)	0.0	(-0.2)	0.0	(0.4)	0.0	(-0.4)	-0.1	(-0.9)	-0.1	(-0.9)
Change in Water Depth Compared to Existing Conditions [ft (%)]															
Jan	---	-0.3	(-2.3)	-0.1	(-0.8)	-0.1	(-0.8)	-0.2	(-1.6)	-0.1	(-0.8)	-0.2	(-1.6)	-0.2	(-1.6)
Feb	---	-0.3	(-2.1)	-0.1	(-0.7)	-0.1	(-0.7)	-0.2	(-1.4)	-0.2	(-1.4)	-0.3	(-2.1)	-0.2	(-1.4)
Mar	---	-0.3	(-2.0)	-0.2	(-1.4)	-0.2	(-1.4)	-0.2	(-1.4)	-0.2	(-1.4)	-0.3	(-2.0)	-0.3	(-2.0)
Apr	---	-0.3	(-2.1)	-0.3	(-2.1)	-0.3	(-2.1)	-0.3	(-2.1)	-0.3	(-2.1)	-0.4	(-2.8)	-0.4	(-2.8)
May	---	-0.5	(-3.8)	-0.6	(-4.5)	-0.6	(-4.5)	-0.5	(-3.8)	-0.7	(-5.3)	-0.7	(-5.3)	-0.7	(-5.3)
Jun	---	-0.4	(-3.1)	-0.7	(-5.4)	-0.7	(-5.4)	-0.4	(-3.1)	-0.7	(-5.4)	-0.7	(-5.4)	-0.7	(-5.4)
Jul	---	-0.5	(-4.6)	-0.7	(-6.4)	-0.7	(-6.4)	-0.5	(-4.6)	-0.7	(-6.4)	-0.7	(-6.4)	-0.7	(-6.4)
Aug	---	-0.7	(-7.8)	-0.8	(-8.9)	-0.8	(-8.9)	-0.7	(-7.8)	-0.8	(-8.9)	-0.9	(-10.0)	-0.9	(-10.0)
Sep	---	-0.8	(-9.8)	-0.8	(-9.8)	-0.8	(-9.8)	-0.7	(-8.5)	-0.8	(-9.8)	-0.8	(-9.8)	-0.8	(-9.8)
Oct	---	-0.3	(-3.6)	-0.4	(-4.8)	-0.4	(-4.8)	-0.2	(-2.4)	-0.4	(-4.8)	-0.5	(-6.0)	-0.5	(-6.0)
Nov	---	-0.1	(-1.1)	-0.4	(-4.5)	-0.4	(-4.5)	-0.1	(-1.1)	-0.4	(-4.5)	-0.4	(-4.5)	-0.5	(-5.6)
Dec	---	-0.3	(-2.8)	0.0	(0.0)	0.0	(0.0)	-0.2	(-1.9)	0.0	(0.0)	-0.1	(-0.9)	-0.1	(-0.9)
Average	---	-0.4	(-3.5)	-0.4	(-3.7)	-0.4	(-3.7)	-0.4	(-3.0)	-0.4	(-3.8)	-0.5	(-4.3)	-0.5	(-4.3)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 258. Monthly Water Depth Normal Year (2005) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Depth (ft)								
Jan	10.2	10.2	10.4	10.4	10.2	10.3	10.1	10.2
Feb	12.1	11.7	11.8	11.9	11.8	11.8	11.6	11.6
Mar	13.2	13.3	13.3	13.3	13.4	13.3	13.1	13.1
Apr	13.9	14.9	14.6	14.6	14.9	14.6	14.5	14.5
May	13.5	11.0	11.4	11.5	11.3	11.5	10.6	10.9
Jun	11.9	7.7	6.7	6.7	7.7	6.7	6.4	6.5
Jul	10.5	5.7	4.0	4.0	5.7	4.0	4.0	4.0
Aug	10.8	4.6	2.9	2.9	4.6	2.9	2.9	2.9
Sep	12.7	6.6	5.8	5.8	6.6	5.8	5.7	5.8
Oct	14.7	8.5	8.0	8.0	8.6	8.0	7.8	7.9
Nov	14.6	8.3	7.7	7.6	8.3	7.6	7.6	7.6
Dec	14.3	6.7	7.0	7.0	7.5	7.0	6.3	6.5
Average	12.7	9.1	8.6	8.6	9.2	8.6	8.4	8.5
Change in Water Depth Compared to No Action [ft (%)]								
Jan	---	---	0.2 (2.2)	0.2 (2.2)	0.0 (0.5)	0.2 (1.8)	-0.1 (-1.0)	0.0 (-0.2)
Feb	---	---	0.1 (0.6)	0.2 (1.5)	0.1 (0.9)	0.1 (0.6)	-0.1 (-1.3)	-0.1 (-1.4)
Mar	---	---	-0.1 (-0.6)	0.0 (0.1)	0.1 (0.7)	-0.1 (-0.7)	-0.2 (-2.0)	-0.2 (-2.0)
Apr	---	---	-0.3 (-2.3)	-0.3 (-2.0)	0.0 (0.3)	-0.3 (-2.3)	-0.4 (-3.0)	-0.4 (-3.0)
May	---	---	0.5 (5.1)	0.5 (5.8)	0.3 (3.2)	0.5 (5.3)	-0.4 (-4.3)	-0.1 (-1.1)
Jun	---	---	-1.0 (-18.0)	-1.0 (-18.0)	0.0 (0.4)	-1.0 (-18.0)	-1.3 (-22.0)	-1.2 (-21.5)
Jul	---	---	-1.7 (-45.0)	-1.7 (-45.0)	0.0 (-0.3)	-1.7 (-45.0)	-1.7 (-45.0)	-1.7 (-45.0)
Aug	---	---	-1.6 (-63.8)	-1.6 (-63.8)	0.0 (-0.8)	-1.6 (-63.8)	-1.7 (-64.2)	-1.7 (-64.2)
Sep	---	---	-0.8 (-17.0)	-0.8 (-17.0)	0.0 (0.4)	-0.8 (-17.2)	-0.9 (-18.7)	-0.8 (-17.6)
Oct	---	---	-0.5 (-8.3)	-0.5 (-8.4)	0.1 (0.8)	-0.5 (-8.4)	-0.8 (-11.9)	-0.6 (-9.8)
Nov	---	---	-0.6 (-9.7)	-0.6 (-9.9)	0.0 (0.5)	-0.6 (-9.9)	-0.7 (-11.3)	-0.6 (-9.9)
Dec	---	---	0.4 (7.9)	0.4 (7.7)	0.8 (17.1)	0.4 (7.7)	-0.4 (-9.0)	-0.2 (-3.4)
Average	---	---	-0.5 (-6.5)	-0.4 (-6.2)	0.1 (1.7)	-0.5 (-6.6)	-0.7 (-10.0)	-0.6 (-9.0)
Change in Water Depth Compared to Existing Conditions [ft (%)]								
Jan	---	0.0 (-0.5)	0.1 (1.7)	0.1 (1.7)	0.0 (0.0)	0.1 (1.3)	-0.1 (-1.5)	-0.1 (-0.7)
Feb	---	-0.4 (-3.8)	-0.3 (-3.2)	-0.2 (-2.3)	-0.3 (-2.9)	-0.3 (-3.2)	-0.5 (-5.0)	-0.5 (-5.1)
Mar	---	0.2 (1.6)	0.1 (1.0)	0.2 (1.7)	0.3 (2.3)	0.1 (0.9)	-0.1 (-0.4)	-0.1 (-0.4)
Apr	---	1.0 (8.3)	0.7 (5.8)	0.7 (6.1)	1.0 (8.7)	0.7 (5.8)	0.6 (5.0)	0.6 (5.1)
May	---	-2.5 (-22.0)	-2.1 (-18.0)	-2.0 (-17.5)	-2.2 (-19.5)	-2.1 (-17.8)	-2.9 (-25.4)	-2.6 (-22.8)
Jun	---	-4.3 (-42.8)	-5.3 (-53.1)	-5.3 (-53.1)	-4.2 (-42.6)	-5.3 (-53.1)	-5.5 (-55.4)	-5.5 (-55.1)
Jul	---	-4.8 (-56.6)	-6.5 (-76.1)	-6.5 (-76.1)	-4.8 (-56.7)	-6.5 (-76.1)	-6.5 (-76.1)	-6.5 (-76.1)
Aug	---	-6.2 (-70.6)	-7.8 (-89.4)	-7.8 (-89.4)	-6.2 (-70.9)	-7.8 (-89.4)	-7.8 (-89.5)	-7.8 (-89.5)
Sep	---	-6.1 (-57.1)	-6.9 (-64.4)	-6.9 (-64.4)	-6.1 (-56.9)	-6.9 (-64.5)	-7.0 (-65.1)	-6.9 (-64.6)
Oct	---	-6.1 (-48.3)	-6.7 (-52.6)	-6.7 (-52.6)	-6.1 (-47.9)	-6.7 (-52.6)	-6.9 (-54.5)	-6.8 (-53.4)
Nov	---	-6.3 (-50.3)	-6.9 (-55.1)	-7.0 (-55.2)	-6.3 (-50.0)	-7.0 (-55.2)	-7.0 (-55.9)	-7.0 (-55.2)
Dec	---	-7.6 (-62.0)	-7.3 (-59.0)	-7.3 (-59.1)	-6.8 (-55.5)	-7.3 (-59.1)	-8.0 (-65.4)	-7.8 (-63.3)
Average	---	-3.6 (-33.7)	-4.1 (-38.0)	-4.0 (-37.8)	-3.5 (-32.5)	-4.1 (-38.0)	-4.3 (-40.3)	-4.2 (-39.6)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 259. Monthly Water Depth Wet Year (1997) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Depth (ft)								
Jan	18.0	18.1	18.5	18.5	18.5	18.5	18.3	18.3
Feb	18.4	18.4	18.7	18.7	18.7	18.7	18.7	18.7
Mar	18.3	18.3	18.4	18.4	18.4	18.4	18.4	18.4
Apr	18.7	18.7	18.6	18.6	18.7	18.6	18.6	18.6
May	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Jun	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Jul	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Aug	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Sep	14.3	14.2	14.2	14.2	14.2	14.2	14.2	14.2
Oct	10.4	10.6	10.1	10.1	10.6	10.1	10.1	10.1
Nov	11.2	11.3	11.0	11.0	11.3	11.0	11.0	10.9
Dec	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Average	17.0	17.0	17.0	17.0	17.1	17.0	17.0	17.0
Change in Water Depth Compared to No Action [ft (%)]								
Jan	---	---	0.4 (2.5)	0.4 (2.5)	0.4 (2.5)	0.4 (2.5)	0.2 (1.2)	0.2 (1.2)
Feb	---	---	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)
Mar	---	---	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)
Apr	---	---	-0.1 (-0.6)	-0.1 (-0.6)	0.0 (0.0)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)
May	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	-0.5 (-5.8)	-0.5 (-5.8)	0.0 (0.0)	-0.5 (-5.8)	-0.5 (-5.8)	-0.5 (-5.8)
Nov	---	---	-0.3 (-3.2)	-0.3 (-3.2)	0.0 (0.0)	-0.3 (-3.2)	-0.3 (-3.2)	-0.4 (-4.3)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	0.0 (-0.1)	0.0 (-0.1)	0.1 (0.4)	0.0 (-0.1)	0.0 (-0.2)	0.0 (-0.2)
Change in Water Depth Compared to Existing Conditions [ft (%)]								
Jan	---	0.1 (0.6)	0.5 (3.1)	0.5 (3.1)	0.5 (3.1)	0.5 (3.1)	0.3 (1.9)	0.3 (1.9)
Feb	---	0.0 (0.0)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)	0.3 (1.8)
Mar	---	0.0 (0.0)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)	0.1 (0.6)
Apr	---	0.0 (0.0)	-0.1 (-0.6)	-0.1 (-0.6)	0.0 (0.0)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)
May	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jun	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)	-0.1 (-0.8)
Oct	---	0.2 (2.4)	-0.3 (-3.6)	-0.3 (-3.6)	0.2 (2.4)	-0.3 (-3.6)	-0.3 (-3.6)	-0.3 (-3.6)
Nov	---	0.1 (1.1)	-0.2 (-2.2)	-0.2 (-2.2)	0.1 (1.1)	-0.2 (-2.2)	-0.2 (-2.2)	-0.3 (-3.3)
Dec	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	0.0 (0.2)	0.0 (0.1)	0.0 (0.1)	0.1 (0.6)	0.0 (0.1)	0.0 (0.0)	0.0 (-0.1)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 260. Monthly Water Depth Dry Year (2004) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Depth (ft)								
Jan	11.1	14.7	14.8	14.8	14.7	14.8	14.8	14.8
Feb	11.6	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Mar	11.6	14.7	14.6	14.6	14.7	14.6	14.6	14.6
Apr	12.1	13.6	13.9	13.9	13.6	13.7	13.4	13.3
May	9.3	7.8	6.8	6.8	7.8	6.8	6.6	6.7
Jun	7.8	8.0	6.8	6.8	7.9	6.8	6.8	6.8
Jul	8.1	8.1	7.1	7.1	8.1	7.1	7.1	7.1
Aug	8.4	8.2	7.5	7.5	8.2	7.5	7.5	7.5
Sep	9.0	8.5	8.3	8.3	8.6	8.3	8.2	8.2
Oct	8.8	8.8	8.4	8.4	8.9	8.4	8.1	8.2
Nov	9.1	9.3	8.7	8.7	9.3	8.7	8.6	8.6
Dec	9.8	10.0	10.1	10.1	10.0	10.0	9.8	9.9
Average	9.7	10.5	10.1	10.1	10.5	10.1	10.0	10.0
Change in Water Depth Compared to No Action [ft (%)]								
Jan	---	---	0.1 (0.8)	0.1 (0.8)	0.0 (0.0)	0.1 (0.8)	0.1 (0.8)	0.1 (0.8)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	-0.1 (-0.8)	-0.1 (-0.8)	0.0 (0.0)	-0.1 (-0.8)	-0.2 (-1.6)	-0.1 (-0.8)
Apr	---	---	0.2 (1.7)	0.3 (2.6)	0.0 (0.0)	0.1 (0.9)	-0.2 (-1.7)	-0.3 (-2.6)
May	---	---	-1.0 (-17.2)	-1.0 (-17.2)	0.0 (0.0)	-1.0 (-17.2)	-1.2 (-20.7)	-1.1 (-19.0)
Jun	---	---	-1.1 (-18.6)	-1.1 (-18.6)	0.0 (0.0)	-1.1 (-18.6)	-1.2 (-20.3)	-1.1 (-18.6)
Jul	---	---	-1.0 (-16.4)	-1.0 (-16.4)	0.0 (0.0)	-1.0 (-16.4)	-1.0 (-16.4)	-1.0 (-16.4)
Aug	---	---	-0.6 (-9.8)	-0.6 (-9.8)	0.1 (1.6)	-0.6 (-9.8)	-0.6 (-9.8)	-0.6 (-9.8)
Sep	---	---	-0.3 (-4.6)	-0.2 (-3.1)	0.1 (1.5)	-0.2 (-3.1)	-0.3 (-4.6)	-0.3 (-4.6)
Oct	---	---	-0.4 (-5.9)	-0.4 (-5.9)	0.1 (1.5)	-0.4 (-5.9)	-0.7 (-10.3)	-0.6 (-8.8)
Nov	---	---	-0.6 (-8.2)	-0.6 (-8.2)	0.0 (0.0)	-0.6 (-8.2)	-0.7 (-9.6)	-0.7 (-9.6)
Dec	---	---	0.1 (1.3)	0.1 (1.3)	0.0 (0.0)	0.0 (0.0)	-0.2 (-2.5)	-0.1 (-1.3)
Average	---	---	-0.4 (-4.6)	-0.4 (-4.4)	0.0 (0.3)	-0.4 (-4.7)	-0.5 (-6.1)	-0.5 (-5.7)
Change in Water Depth Compared to Existing Conditions [ft (%)]								
Jan	---	3.6 (39.6)	3.7 (40.7)	3.7 (40.7)	3.6 (39.6)	3.7 (40.7)	3.7 (40.7)	3.7 (40.7)
Feb	---	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)
Mar	---	3.2 (33.7)	3.1 (32.6)	3.1 (32.6)	3.2 (33.7)	3.1 (32.6)	3.0 (31.6)	3.1 (32.6)
Apr	---	1.5 (14.9)	1.7 (16.8)	1.8 (17.8)	1.5 (14.9)	1.6 (15.8)	1.3 (12.9)	1.2 (11.9)
May	---	-1.5 (-20.5)	-2.5 (-34.2)	-2.5 (-34.2)	-1.5 (-20.5)	-2.5 (-34.2)	-2.7 (-37.0)	-2.6 (-35.6)
Jun	---	0.1 (1.7)	-1.0 (-17.2)	-1.0 (-17.2)	0.1 (1.7)	-1.0 (-17.2)	-1.1 (-19.0)	-1.0 (-17.2)
Jul	---	0.0 (0.0)	-1.0 (-16.4)	-1.0 (-16.4)	0.0 (0.0)	-1.0 (-16.4)	-1.0 (-16.4)	-1.0 (-16.4)
Aug	---	-0.3 (-4.7)	-0.9 (-14.1)	-0.9 (-14.1)	-0.2 (-3.1)	-0.9 (-14.1)	-0.9 (-14.1)	-0.9 (-14.1)
Sep	---	-0.5 (-7.1)	-0.8 (-11.4)	-0.7 (-10.0)	-0.4 (-5.7)	-0.7 (-10.0)	-0.8 (-11.4)	-0.8 (-11.4)
Oct	---	0.0 (0.0)	-0.4 (-5.9)	-0.4 (-5.9)	0.1 (1.5)	-0.4 (-5.9)	-0.7 (-10.3)	-0.6 (-8.8)
Nov	---	0.2 (2.8)	-0.4 (-5.6)	-0.4 (-5.6)	0.2 (2.8)	-0.4 (-5.6)	-0.5 (-7.0)	-0.5 (-7.0)
Dec	---	0.2 (2.6)	0.3 (3.8)	0.3 (3.8)	0.2 (2.6)	0.2 (2.6)	0.0 (0.0)	0.1 (1.3)
Average	---	0.8 (10.5)	0.4 (5.4)	0.4 (5.6)	0.8 (10.8)	0.4 (5.3)	0.3 (3.8)	0.3 (4.2)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 261. Monthly Water Depth Overall Average – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Depth (ft)															
Jan	14.9	13.3		13.4		13.4		13.4		13.4		13.4		13.4	
Feb	16.3	15.1		15.3		15.3		15.2		15.3		15.1		15.1	
Mar	16.7	16.0		16.2		16.1		16.1		16.1		16.0		16.1	
Apr	16.5	16.0		16.0		16.0		16.0		16.0		15.9		15.9	
May	15.3	14.8		14.9		14.9		14.9		14.9		14.8		14.9	
Jun	14.9	14.0		14.1		14.1		14.1		14.1		14.0		14.1	
Jul	12.9	12.1		12.1		12.1		12.1		12.1		12.1		12.1	
Aug	11.0	9.9		9.9		9.9		9.9		9.9		9.9		9.9	
Sep	10.2	9.2		9.4		9.4		9.3		9.3		9.1		9.2	
Oct	10.3	9.0		9.1		9.1		9.1		9.1		8.9		9.1	
Nov	10.9	9.6		9.6		9.6		9.6		9.6		9.5		9.5	
Dec	12.6	11.2		11.3		11.3		11.2		11.3		11.1		11.2	
Average	13.5	12.5		12.6		12.6		12.6		12.6		12.5		12.5	
Change in Water Depth Compared to No Action [ft (%)]															
Jan	---	---		0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.1	(0.9)	0.0	(0.0)	0.0	(0.0)
Feb	---	---		0.2	(1.5)	0.2	(1.5)	0.1	(0.8)	0.2	(1.5)	0.0	(0.0)	0.0	(0.0)
Mar	---	---		0.1	(0.7)	0.1	(0.7)	0.1	(0.7)	0.1	(0.7)	0.0	(0.0)	0.1	(0.7)
Apr	---	---		0.1	(0.7)	0.1	(0.7)	0.0	(0.0)	0.1	(0.7)	0.0	(0.0)	0.0	(0.0)
May	---	---		0.1	(0.8)	0.1	(0.8)	0.1	(0.8)	0.1	(0.8)	0.0	(0.0)	0.1	(0.8)
Jun	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Jul	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Aug	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Sep	---	---		0.3	(4.2)	0.2	(2.8)	0.2	(2.8)	0.2	(2.8)	0.0	(0.0)	0.1	(1.4)
Oct	---	---		0.1	(1.4)	0.1	(1.4)	0.1	(1.4)	0.1	(1.4)	-0.1	(-1.4)	0.1	(1.4)
Nov	---	---		0.1	(1.3)	0.1	(1.3)	0.1	(1.3)	0.1	(1.3)	0.0	(0.0)	0.0	(0.0)
Dec	---	---		0.1	(1.1)	0.1	(1.1)	0.0	(0.0)	0.1	(1.1)	-0.1	(-1.1)	0.0	(0.0)
Average	---	---		0.1	(1.0)	0.1	(0.9)	0.1	(0.6)	0.1	(0.9)	0.0	(-0.2)	0.0	(0.3)
Change in Water Depth Compared to Existing Conditions [ft (%)]															
Jan	---	-1.6	(-12.4)	-1.5	(-11.6)	-1.5	(-11.6)	-1.5	(-11.6)	-1.5	(-11.6)	-1.6	(-12.4)	-1.6	(-12.4)
Feb	---	-1.2	(-8.4)	-1.0	(-7.0)	-1.0	(-7.0)	-1.1	(-7.7)	-1.0	(-7.0)	-1.2	(-8.4)	-1.2	(-8.4)
Mar	---	-0.7	(-4.8)	-0.6	(-4.1)	-0.6	(-4.1)	-0.6	(-4.1)	-0.6	(-4.1)	-0.7	(-4.8)	-0.6	(-4.1)
Apr	---	-0.6	(-4.1)	-0.5	(-3.4)	-0.5	(-3.4)	-0.6	(-4.1)	-0.5	(-3.4)	-0.6	(-4.1)	-0.6	(-4.1)
May	---	-0.5	(-3.8)	-0.4	(-3.0)	-0.4	(-3.0)	-0.4	(-3.0)	-0.4	(-3.0)	-0.5	(-3.8)	-0.4	(-3.0)
Jun	---	-0.9	(-7.0)	-0.9	(-7.0)	-0.9	(-7.0)	-0.9	(-7.0)	-0.9	(-7.0)	-0.9	(-7.0)	-0.9	(-7.0)
Jul	---	-0.8	(-7.3)	-0.8	(-7.3)	-0.8	(-7.3)	-0.8	(-7.3)	-0.8	(-7.3)	-0.8	(-7.3)	-0.8	(-7.3)
Aug	---	-1.1	(-12.2)	-1.1	(-12.2)	-1.1	(-12.2)	-1.1	(-12.2)	-1.1	(-12.2)	-1.1	(-12.2)	-1.1	(-12.2)
Sep	---	-1.1	(-13.4)	-0.8	(-9.8)	-0.9	(-11.0)	-0.9	(-11.0)	-0.9	(-11.0)	-1.1	(-13.4)	-1.0	(-12.2)
Oct	---	-1.3	(-15.7)	-1.2	(-14.5)	-1.2	(-14.5)	-1.2	(-14.5)	-1.2	(-14.5)	-1.4	(-16.9)	-1.2	(-14.5)
Nov	---	-1.4	(-15.7)	-1.3	(-14.6)	-1.3	(-14.6)	-1.3	(-14.6)	-1.3	(-14.6)	-1.4	(-15.7)	-1.4	(-15.7)
Dec	---	-1.4	(-13.2)	-1.3	(-12.3)	-1.3	(-12.3)	-1.4	(-13.2)	-1.3	(-12.3)	-1.5	(-14.2)	-1.4	(-13.2)
Average	---	-1.1	(-9.1)	-1.0	(-8.2)	-1.0	(-8.3)	-1.0	(-8.5)	-1.0	(-8.3)	-1.1	(-9.2)	-1.0	(-8.8)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 262. Monthly Water Depth Normal Year (2005) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Water Depth (ft)															
Jan	10.2	9.7		10.0		10.0		10.0		10.0		9.8		9.8	
Feb	12.1	13.3		15.1		15.0		15.1		15.0		12.5		13.0	
Mar	13.2	15.1		15.1		15.1		15.1		15.1		15.1		15.1	
Apr	13.9	15.2		15.2		15.2		15.2		15.2		15.2		15.2	
May	13.5	13.0		13.1		13.1		13.0		13.1		13.0		13.0	
Jun	11.9	6.4		6.4		6.4		6.4		6.4		6.4		6.4	
Jul	10.5	4.1		4.1		4.1		4.1		4.1		4.1		4.1	
Aug	10.8	3.0		3.0		3.0		3.0		3.0		3.0		3.0	
Sep	12.7	6.2		6.2		6.2		6.2		6.2		6.2		6.2	
Oct	14.7	8.0		8.0		8.0		8.0		8.0		8.0		8.0	
Nov	14.6	7.9		7.8		7.8		7.9		7.8		7.8		7.9	
Dec	14.3	6.5		6.5		6.5		6.5		6.5		6.5		6.5	
Average	12.7	9.0		9.2		9.2		9.2		9.2		9.0		9.0	
Change in Water Depth Compared to No Action [ft (%)]															
Jan	---	---		0.3	(3.6)	0.2	(3.1)	0.3	(3.9)	0.2	(3.0)	0.0	(0.3)	0.0	(0.3)
Feb	---	---		1.7	(15.3)	1.7	(15.0)	1.8	(15.5)	1.7	(14.8)	-0.8	(-7.2)	-0.4	(-3.4)
Mar	---	---		0.0	(0.0)	0.0	(0.1)	0.0	(0.1)	0.0	(0.0)	0.0	(0.1)	0.0	(0.0)
Apr	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
May	---	---		0.1	(0.7)	0.1	(0.7)	0.0	(0.1)	0.1	(0.7)	0.0	(-0.1)	0.0	(0.4)
Jun	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Jul	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Aug	---	---		0.0	(2.0)	0.0	(1.0)	0.0	(2.0)	0.0	(1.0)	0.0	(0.0)	0.0	(0.0)
Sep	---	---		0.0	(0.5)	0.0	(0.0)	0.0	(0.0)	0.0	(0.2)	0.0	(-0.5)	0.0	(0.0)
Oct	---	---		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Nov	---	---		-0.1	(-1.5)	-0.1	(-1.5)	0.0	(-0.2)	-0.1	(-1.5)	-0.1	(-1.5)	0.0	(-0.7)
Dec	---	---		0.0	(0.4)	0.0	(0.2)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Average	---	---		0.2	(2.4)	0.2	(2.3)	0.2	(2.5)	0.2	(2.3)	-0.1	(-1.1)	0.0	(-0.4)
Change in Water Depth Compared to Existing Conditions [ft (%)]															
Jan	---	-0.5	(-6.1)	-0.2	(-2.7)	-0.3	(-3.2)	-0.2	(-2.4)	-0.3	(-3.3)	-0.5	(-5.8)	-0.5	(-5.8)
Feb	---	1.2	(12.1)	3.0	(29.2)	2.9	(28.9)	3.0	(29.5)	2.9	(28.7)	0.4	(4.0)	0.8	(8.3)
Mar	---	1.9	(17.4)	1.9	(17.4)	2.0	(17.5)	2.0	(17.5)	1.9	(17.4)	2.0	(17.5)	1.9	(17.4)
Apr	---	1.3	(11.2)	1.3	(11.2)	1.3	(11.2)	1.3	(11.2)	1.3	(11.2)	1.3	(11.2)	1.3	(11.2)
May	---	-0.5	(-4.7)	-0.5	(-4.0)	-0.5	(-4.0)	-0.5	(-4.6)	-0.5	(-4.0)	-0.5	(-4.8)	-0.5	(-4.3)
Jun	---	-5.5	(-55.5)	-5.5	(-55.5)	-5.5	(-55.5)	-5.5	(-55.5)	-5.5	(-55.5)	-5.5	(-55.5)	-5.5	(-55.5)
Jul	---	-6.4	(-75.8)	-6.4	(-75.8)	-6.4	(-75.8)	-6.4	(-75.8)	-6.4	(-75.8)	-6.4	(-75.8)	-6.4	(-75.8)
Aug	---	-7.8	(-88.8)	-7.8	(-88.6)	-7.8	(-88.7)	-7.8	(-88.6)	-7.8	(-88.7)	-7.8	(-88.8)	-7.8	(-88.8)
Sep	---	-6.5	(-60.5)	-6.5	(-60.3)	-6.5	(-60.5)	-6.5	(-60.5)	-6.5	(-60.4)	-6.5	(-60.7)	-6.5	(-60.5)
Oct	---	-6.6	(-52.5)	-6.6	(-52.5)	-6.6	(-52.5)	-6.6	(-52.5)	-6.6	(-52.5)	-6.6	(-52.5)	-6.6	(-52.5)
Nov	---	-6.7	(-53.0)	-6.8	(-53.7)	-6.8	(-53.7)	-6.7	(-53.1)	-6.8	(-53.7)	-6.8	(-53.7)	-6.7	(-53.3)
Dec	---	-7.8	(-63.8)	-7.8	(-63.6)	-7.8	(-63.7)	-7.8	(-63.8)	-7.8	(-63.8)	-7.8	(-63.8)	-7.8	(-63.8)
Average	---	-3.7	(-34.2)	-3.5	(-32.6)	-3.5	(-32.7)	-3.5	(-32.6)	-3.5	(-32.7)	-3.7	(-34.9)	-3.7	(-34.5)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 263. Monthly Water Depth Wet Year (1997) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Depth (ft)								
Jan	18.0	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Feb	18.4	17.9	17.9	17.9	17.9	17.9	17.9	17.9
Mar	18.3	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Apr	18.7	18.6	18.6	18.6	18.6	18.6	18.6	18.6
May	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Jun	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Jul	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Aug	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Sep	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Oct	10.4	10.2	10.2	10.2	10.2	10.2	10.2	10.3
Nov	11.2	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Dec	17.3	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Average	17.0	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Change in Water Depth Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
May	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (1.2)
Nov	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.1)
Change in Water Depth Compared to Existing Conditions [ft (%)]								
Jan	---	-0.5 (-3.1)	-0.5 (-3.1)	-0.5 (-3.1)	-0.5 (-3.1)	-0.5 (-3.1)	-0.5 (-3.1)	-0.5 (-3.1)
Feb	---	-0.5 (-3.0)	-0.5 (-3.0)	-0.5 (-3.0)	-0.5 (-3.0)	-0.5 (-3.0)	-0.5 (-3.0)	-0.5 (-3.0)
Mar	---	-0.3 (-1.8)	-0.3 (-1.8)	-0.3 (-1.8)	-0.3 (-1.8)	-0.3 (-1.8)	-0.3 (-1.8)	-0.3 (-1.8)
Apr	---	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)	-0.1 (-0.6)
May	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jun	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Jul	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Sep	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)	-0.2 (-2.4)	-0.1 (-1.2)
Nov	---	-0.3 (-3.3)	-0.3 (-3.3)	-0.3 (-3.3)	-0.3 (-3.3)	-0.3 (-3.3)	-0.3 (-3.3)	-0.3 (-3.3)
Dec	---	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)	-0.1 (-0.7)
Average	---	-0.2 (-1.1)	-0.2 (-1.1)	-0.2 (-1.1)	-0.2 (-1.1)	-0.2 (-1.1)	-0.2 (-1.1)	-0.2 (-1.1)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 264. Monthly Water Depth Dry Year (2004) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Water Depth (ft)								
Jan	11.1	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Feb	11.6	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Mar	11.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
Apr	12.1	14.3	14.3	14.3	14.2	14.3	14.2	14.2
May	9.3	12.6	12.6	12.6	12.5	12.6	11.4	12.8
Jun	7.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Jul	8.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Aug	8.4	7.6	7.7	7.7	7.7	7.7	7.6	7.6
Sep	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Oct	8.8	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Nov	9.1	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Dec	9.8	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Average	9.7	10.6	10.6	10.6	10.6	10.6	10.5	10.6
Change in Water Depth Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Feb	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Apr	---	---	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.8)	0.0 (0.0)	-0.1 (-0.8)	-0.1 (-0.8)
May	---	---	0.0 (0.0)	0.0 (0.0)	-0.1 (-0.9)	0.0 (0.0)	-1.2 (-11.3)	0.2 (1.9)
Jun	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-0.1 (-2.1)	0.0 (0.0)
Jul	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Aug	---	---	0.1 (1.8)	0.1 (1.8)	0.1 (1.8)	0.1 (1.8)	0.0 (0.0)	0.0 (0.0)
Sep	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Oct	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Nov	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Dec	---	---	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Average	---	---	0.0 (0.1)	0.0 (0.1)	0.0 (-0.1)	0.0 (0.1)	-0.1 (-1.4)	0.0 (0.1)
Change in Water Depth Compared to Existing Conditions [ft (%)]								
Jan	---	3.6 (39.6)	3.6 (39.6)	3.6 (39.6)	3.6 (39.6)	3.6 (39.6)	3.6 (39.6)	3.6 (39.6)
Feb	---	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)	3.2 (33.3)
Mar	---	3.1 (32.6)	3.1 (32.6)	3.1 (32.6)	3.1 (32.6)	3.1 (32.6)	3.1 (32.6)	3.1 (32.6)
Apr	---	2.2 (21.8)	2.2 (21.8)	2.2 (21.8)	2.1 (20.8)	2.2 (21.8)	2.1 (20.8)	2.1 (20.8)
May	---	3.3 (45.2)	3.3 (45.2)	3.3 (45.2)	3.2 (43.8)	3.3 (45.2)	2.1 (28.8)	3.5 (47.9)
Jun	---	-1.0 (-17.2)	-1.0 (-17.2)	-1.0 (-17.2)	-1.0 (-17.2)	-1.0 (-17.2)	-1.1 (-19.0)	-1.0 (-17.2)
Jul	---	-0.9 (-14.8)	-0.9 (-14.8)	-0.9 (-14.8)	-0.9 (-14.8)	-0.9 (-14.8)	-0.9 (-14.8)	-0.9 (-14.8)
Aug	---	-0.8 (-12.5)	-0.7 (-10.9)	-0.7 (-10.9)	-0.7 (-10.9)	-0.7 (-10.9)	-0.8 (-12.5)	-0.8 (-12.5)
Sep	---	-1.0 (-14.3)	-1.0 (-14.3)	-1.0 (-14.3)	-1.0 (-14.3)	-1.0 (-14.3)	-1.0 (-14.3)	-1.0 (-14.3)
Oct	---	-0.6 (-8.8)	-0.6 (-8.8)	-0.6 (-8.8)	-0.6 (-8.8)	-0.6 (-8.8)	-0.6 (-8.8)	-0.6 (-8.8)
Nov	---	-0.5 (-7.0)	-0.5 (-7.0)	-0.5 (-7.0)	-0.5 (-7.0)	-0.5 (-7.0)	-0.5 (-7.0)	-0.5 (-7.0)
Dec	---	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)	-0.4 (-5.1)
Average	---	0.9 (11.0)	0.9 (11.1)	0.9 (11.1)	0.8 (10.9)	0.9 (11.1)	0.7 (9.5)	0.9 (11.1)

* Percent changes are calculated using a minimum reservoir water depth of 2.0 feet.

Table 265. Monthly Surface Area Overall Average – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	498	488		493		493		489		493		489		491	
Feb	548	538		541		541		539		541		537		539	
Mar	558	551		551		552		551		551		548		550	
Apr	551	543		540		541		542		540		538		539	
May	509	493		488		489		494		488		487		487	
Jun	496	482		472		472		482		472		472		471	
Jul	425	410		403		403		411		403		403		402	
Aug	361	337		332		332		338		332		331		330	
Sep	334	305		306		305		308		306		305		304	
Oct	334	323		319		319		327		319		315		314	
Nov	357	351		343		342		352		343		340		339	
Dec	415	406		415		415		408		415		412		412	
Average	449	436		434		434		437		434		431		432	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		6	(1.1)	6	(1.1)	2	(0.3)	5	(1.1)	1	(0.3)	3	(0.7)
Feb	---	---		3	(0.6)	4	(0.7)	1	(0.3)	3	(0.6)	-1	(-0.2)	1	(0.1)
Mar	---	---		1	(0.1)	1	(0.1)	1	(0.1)	1	(0.1)	-2	(-0.4)	0	(-0.1)
Apr	---	---		-3	(-0.6)	-3	(-0.5)	-1	(-0.2)	-3	(-0.6)	-6	(-1.0)	-4	(-0.7)
May	---	---		-5	(-1.0)	-5	(-1.0)	1	(0.2)	-5	(-1.0)	-7	(-1.3)	-7	(-1.3)
Jun	---	---		-10	(-2.0)	-10	(-2.0)	1	(0.1)	-10	(-2.0)	-10	(-2.1)	-11	(-2.2)
Jul	---	---		-7	(-1.8)	-8	(-1.8)	0	(0.1)	-7	(-1.8)	-8	(-1.9)	-8	(-2.0)
Aug	---	---		-5	(-1.4)	-5	(-1.5)	2	(0.4)	-5	(-1.3)	-6	(-1.6)	-7	(-1.9)
Sep	---	---		1	(0.4)	1	(0.3)	4	(1.2)	1	(0.4)	0	(0.0)	0	(-0.1)
Oct	---	---		-4	(-1.3)	-5	(-1.4)	4	(1.2)	-5	(-1.5)	-8	(-2.5)	-9	(-2.8)
Nov	---	---		-9	(-2.4)	-9	(-2.6)	1	(0.3)	-9	(-2.4)	-11	(-3.2)	-12	(-3.5)
Dec	---	---		9	(2.2)	8	(2.0)	2	(0.5)	9	(2.1)	6	(1.4)	6	(1.4)
Average	---	---		-2	(-0.4)	-2	(-0.5)	1	(0.3)	-2	(-0.5)	-4	(-1.0)	-4	(-0.9)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-10	(-2.0)	-5	(-0.9)	-5	(-0.9)	-9	(-1.7)	-5	(-1.0)	-9	(-1.8)	-7	(-1.4)
Feb	---	-10	(-1.8)	-7	(-1.2)	-6	(-1.2)	-9	(-1.6)	-7	(-1.2)	-11	(-2.0)	-9	(-1.7)
Mar	---	-8	(-1.4)	-7	(-1.3)	-7	(-1.2)	-7	(-1.3)	-7	(-1.3)	-10	(-1.8)	-8	(-1.4)
Apr	---	-8	(-1.4)	-11	(-2.0)	-10	(-1.9)	-9	(-1.6)	-11	(-2.0)	-13	(-2.4)	-12	(-2.1)
May	---	-16	(-3.1)	-21	(-4.0)	-21	(-4.0)	-15	(-2.9)	-21	(-4.0)	-22	(-4.4)	-22	(-4.4)
Jun	---	-14	(-2.9)	-24	(-4.8)	-24	(-4.8)	-14	(-2.8)	-24	(-4.8)	-24	(-4.9)	-25	(-5.0)
Jul	---	-15	(-3.5)	-22	(-5.3)	-23	(-5.3)	-15	(-3.5)	-23	(-5.3)	-23	(-5.3)	-23	(-5.5)
Aug	---	-25	(-6.8)	-29	(-8.1)	-29	(-8.1)	-23	(-6.4)	-29	(-8.0)	-30	(-8.3)	-31	(-8.6)
Sep	---	-29	(-8.7)	-28	(-8.3)	-28	(-8.4)	-25	(-7.6)	-28	(-8.3)	-29	(-8.6)	-29	(-8.8)
Oct	---	-11	(-3.2)	-15	(-4.5)	-15	(-4.5)	-7	(-2.0)	-15	(-4.6)	-19	(-5.6)	-20	(-5.9)
Nov	---	-5	(-1.5)	-14	(-3.9)	-15	(-4.1)	-4	(-1.2)	-14	(-3.9)	-16	(-4.6)	-18	(-4.9)
Dec	---	-9	(-2.1)	0	(0.1)	-1	(-0.1)	-7	(-1.6)	0	(0.0)	-3	(-0.7)	-3	(-0.7)
Average	---	-13	(-2.9)	-15	(-3.4)	-15	(-3.4)	-12	(-2.6)	-15	(-3.4)	-17	(-3.9)	-17	(-3.8)

Table 266. Monthly Surface Area Normal Year (2005) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	322	321	328	328	323	326	318	320
Feb	394	379	382	385	383	381	374	374
Mar	432	439	437	440	442	436	431	431
Apr	461	497	486	488	498	486	483	483
May	446	354	373	375	365	374	342	353
Jun	386	240	212	212	240	212	206	207
Jul	332	187	140	140	187	140	140	140
Aug	342	157	92	92	157	92	91	91
Sep	416	211	190	190	211	190	188	189
Oct	489	265	249	249	267	249	242	246
Nov	487	257	239	239	258	239	237	239
Dec	475	213	223	223	235	222	202	209
Average	415	293	279	280	297	279	271	274
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	7 (2.0)	7 (2.1)	2 (0.5)	5 (1.7)	-3 (-0.9)	-1 (-0.2)
Feb	---	---	2 (0.6)	6 (1.5)	3 (0.9)	2 (0.6)	-5 (-1.3)	-5 (-1.4)
Mar	---	---	-3 (-0.6)	1 (0.1)	3 (0.7)	-3 (-0.6)	-8 (-1.8)	-8 (-1.9)
Apr	---	---	-11 (-2.1)	-9 (-1.9)	1 (0.3)	-11 (-2.2)	-14 (-2.8)	-14 (-2.7)
May	---	---	19 (5.5)	22 (6.1)	11 (3.1)	20 (5.7)	-11 (-3.2)	-1 (-0.2)
Jun	---	---	-28 (-11.6)	-28 (-11.7)	1 (0.3)	-28 (-11.6)	-34 (-14.2)	-33 (-13.9)
Jul	---	---	-47 (-25.2)	-47 (-25.2)	0 (-0.1)	-47 (-25.2)	-47 (-25.2)	-47 (-25.2)
Aug	---	---	-66 (-41.6)	-66 (-41.7)	-1 (-0.4)	-65 (-41.5)	-67 (-42.2)	-66 (-42.0)
Sep	---	---	-21 (-9.8)	-21 (-9.8)	1 (0.3)	-21 (-9.8)	-23 (-10.8)	-22 (-10.2)
Oct	---	---	-16 (-6.1)	-16 (-6.1)	2 (0.6)	-16 (-6.2)	-23 (-8.7)	-19 (-7.2)
Nov	---	---	-18 (-6.8)	-18 (-6.9)	1 (0.3)	-18 (-6.9)	-20 (-7.9)	-18 (-7.0)
Dec	---	---	10 (4.6)	10 (4.5)	22 (10.1)	10 (4.5)	-11 (-5.0)	-4 (-1.9)
Average	---	---	-14 (-4.8)	-13 (-4.6)	4 (1.3)	-14 (-4.9)	-22 (-7.6)	-20 (-6.7)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-1 (-0.4)	5 (1.6)	5 (1.6)	0 (0.0)	4 (1.2)	-4 (-1.4)	-2 (-0.6)
Feb	---	-15 (-3.7)	-12 (-3.1)	-9 (-2.2)	-11 (-2.8)	-12 (-3.1)	-20 (-5.0)	-20 (-5.0)
Mar	---	7 (1.6)	4 (1.0)	7 (1.7)	10 (2.3)	4 (0.9)	-1 (-0.3)	-2 (-0.4)
Apr	---	36 (7.8)	26 (5.5)	27 (5.8)	38 (8.1)	25 (5.5)	22 (4.8)	23 (4.9)
May	---	-93 (-20.7)	-73 (-16.4)	-71 (-15.9)	-82 (-18.3)	-72 (-16.2)	-104 (-23.2)	-93 (-20.9)
Jun	---	-147 (-37.9)	-174 (-45.1)	-175 (-45.2)	-146 (-37.8)	-174 (-45.1)	-181 (-46.7)	-180 (-46.6)
Jul	---	-145 (-43.7)	-192 (-57.9)	-192 (-57.9)	-145 (-43.8)	-192 (-57.9)	-192 (-57.9)	-192 (-57.9)
Aug	---	-184 (-53.9)	-250 (-73.1)	-250 (-73.1)	-185 (-54.1)	-250 (-73.0)	-251 (-73.4)	-250 (-73.3)
Sep	---	-205 (-49.3)	-226 (-54.3)	-226 (-54.3)	-204 (-49.2)	-226 (-54.3)	-228 (-54.8)	-227 (-54.5)
Oct	---	-224 (-45.7)	-240 (-49.0)	-240 (-49.1)	-222 (-45.4)	-240 (-49.1)	-247 (-50.4)	-243 (-49.6)
Nov	---	-230 (-47.2)	-247 (-50.8)	-248 (-50.8)	-229 (-47.0)	-248 (-50.8)	-250 (-51.4)	-248 (-50.9)
Dec	---	-262 (-55.1)	-252 (-53.1)	-252 (-53.1)	-240 (-50.6)	-252 (-53.1)	-273 (-57.4)	-266 (-56.0)
Average	---	-122 (-29.3)	-136 (-32.7)	-135 (-32.6)	-118 (-28.4)	-136 (-32.8)	-144 (-34.7)	-142 (-34.1)

Table 267. Monthly Surface Area Wet Year (1997) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action	Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)														
Jan	613	616	627		627		626		627		621		623	
Feb	625	626	632		632		632		632		632		632	
Mar	621	622	625		625		624		625		625		625	
Apr	632	633	632		632		633		632		632		632	
May	660	660	660		660		660		660		660		660	
Jun	660	660	660		660		660		660		660		660	
Jul	647	647	647		647		647		647		647		647	
Aug	649	648	648		648		648		648		648		648	
Sep	474	471	471		471		471		471		471		471	
Oct	328	337	318		318		337		318		318		318	
Nov	360	364	349		349		364		349		349		349	
Dec	584	584	584		584		584		584		583		584	
Average	571	572	571		571		574		571		571		571	
Change in Surface Area Compared to No Action [acres (%)]														
Jan	---	---	11	(1.9)	11	(1.9)	11	(1.7)	11	(1.9)	5	(0.8)	8	(1.2)
Feb	---	---	6	(1.0)	6	(1.0)	6	(0.9)	6	(1.0)	6	(1.0)	6	(1.0)
Mar	---	---	3	(0.4)	3	(0.4)	2	(0.4)	3	(0.4)	3	(0.4)	3	(0.4)
Apr	---	---	-1	(-0.2)	-1	(-0.2)	0	(0.0)	-1	(-0.2)	-1	(-0.2)	-1	(-0.2)
May	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---	-19	(-5.6)	-19	(-5.6)	0	(0.0)	-19	(-5.6)	-19	(-5.6)	-19	(-5.6)
Nov	---	---	-15	(-4.0)	-15	(-4.0)	0	(0.0)	-15	(-4.0)	-15	(-4.0)	-15	(-4.1)
Dec	---	---	0	(0.1)	0	(0.1)	0	(0.0)	0	(0.1)	0	(0.0)	0	(0.0)
Average	---	---	-1	(-0.2)	-1	(-0.2)	2	(0.3)	-1	(-0.2)	-2	(-0.3)	-2	(-0.3)
Change in Surface Area Compared to Existing Conditions [acres (%)]														
Jan	---	---	14	(2.3)	14	(2.3)	14	(2.2)	14	(2.3)	8	(1.3)	11	(1.7)
Feb	---	---	7	(1.2)	7	(1.2)	7	(1.1)	7	(1.2)	7	(1.2)	7	(1.2)
Mar	---	---	3	(0.5)	3	(0.5)	3	(0.5)	3	(0.5)	3	(0.5)	3	(0.5)
Apr	---	---	-1	(-0.1)	-1	(-0.1)	1	(0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)
May	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---	0	(-0.1)	0	(-0.1)	0	(-0.1)	0	(-0.1)	0	(-0.1)	0	(-0.1)
Sep	---	---	-3	(-0.7)	-3	(-0.7)	-4	(-0.7)	-3	(-0.7)	-3	(-0.7)	-3	(-0.7)
Oct	---	---	-10	(-3.1)	-10	(-3.1)	8	(2.6)	-10	(-3.1)	-10	(-3.1)	-10	(-3.1)
Nov	---	---	-11	(-2.9)	-11	(-2.9)	4	(1.1)	-11	(-2.9)	-10	(-2.9)	-11	(-3.0)
Dec	---	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---	0	(0.0)	0	(0.0)	3	(0.5)	0	(0.0)	-1	(-0.1)	0	(-0.1)

Table 268. Monthly Surface Area Dry Year (2004) – Holbrook Reservoir (Direct Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	356	491		493		493		491		493		493		493	
Feb	374	494		495		495		494		495		495		495	
Mar	372	489		486		486		490		486		485		485	
Apr	395	450		458		460		449		452		441		439	
May	296	245		216		217		244		216		210		214	
Jun	243	248		215		214		248		215		214		215	
Jul	253	252		223		223		252		223		223		223	
Aug	261	254		234		234		254		235		234		234	
Sep	280	266		257		257		267		259		254		255	
Oct	272	275		260		260		276		260		254		255	
Nov	284	289		271		271		289		271		268		269	
Dec	307	315		316		316		315		315		307		310	
Average	308	339		327		327		339		327		323		324	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		2	(0.5)	2	(0.5)	0	(0.0)	2	(0.5)	2	(0.4)	2	(0.4)
Feb	---	---		1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	1	(0.1)	1	(0.1)
Mar	---	---		-3	(-0.7)	-3	(-0.7)	1	(0.2)	-3	(-0.7)	-4	(-0.9)	-4	(-0.8)
Apr	---	---		9	(1.9)	10	(2.2)	-1	(-0.2)	2	(0.4)	-9	(-1.9)	-11	(-2.4)
May	---	---		-29	(-11.6)	-28	(-11.4)	0	(-0.2)	-29	(-11.8)	-35	(-14.3)	-31	(-12.6)
Jun	---	---		-33	(-13.4)	-33	(-13.4)	0	(0.0)	-33	(-13.3)	-33	(-13.5)	-33	(-13.2)
Jul	---	---		-29	(-11.5)	-29	(-11.5)	0	(0.0)	-29	(-11.5)	-29	(-11.5)	-29	(-11.5)
Aug	---	---		-19	(-7.6)	-19	(-7.6)	0	(0.0)	-19	(-7.4)	-20	(-7.8)	-20	(-7.8)
Sep	---	---		-9	(-3.3)	-8	(-3.2)	2	(0.6)	-7	(-2.5)	-11	(-4.3)	-10	(-3.9)
Oct	---	---		-15	(-5.3)	-14	(-5.2)	2	(0.6)	-14	(-5.2)	-21	(-7.6)	-20	(-7.3)
Nov	---	---		-18	(-6.3)	-18	(-6.3)	-1	(-0.2)	-18	(-6.2)	-21	(-7.3)	-20	(-7.0)
Dec	---	---		1	(0.4)	1	(0.4)	0	(-0.1)	0	(-0.1)	-8	(-2.5)	-5	(-1.6)
Average	---	---		-12	(-3.5)	-12	(-3.4)	0	(0.1)	-12	(-3.6)	-16	(-4.6)	-15	(-4.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	135	(37.9)	137	(38.6)	137	(38.6)	135	(38.0)	137	(38.6)	137	(38.6)	137	(38.6)
Feb	---	120	(32.0)	120	(32.2)	120	(32.2)	120	(32.0)	120	(32.2)	120	(32.2)	120	(32.2)
Mar	---	117	(31.4)	114	(30.6)	114	(30.6)	118	(31.8)	114	(30.5)	113	(30.3)	113	(30.4)
Apr	---	55	(14.0)	64	(16.2)	65	(16.5)	55	(13.8)	57	(14.4)	47	(11.8)	44	(11.2)
May	---	-51	(-17.2)	-79	(-26.8)	-79	(-26.6)	-51	(-17.3)	-80	(-27.0)	-86	(-29.0)	-82	(-27.6)
Jun	---	5	(2.0)	-28	(-11.6)	-28	(-11.7)	5	(2.0)	-28	(-11.6)	-29	(-11.7)	-28	(-11.5)
Jul	---	-1	(-0.4)	-30	(-11.8)	-30	(-11.9)	-1	(-0.4)	-30	(-11.8)	-30	(-11.9)	-30	(-11.9)
Aug	---	-8	(-3.0)	-27	(-10.4)	-27	(-10.4)	-8	(-2.9)	-27	(-10.2)	-28	(-10.5)	-28	(-10.5)
Sep	---	-14	(-5.0)	-23	(-8.1)	-22	(-8.0)	-12	(-4.4)	-21	(-7.4)	-25	(-9.1)	-24	(-8.7)
Oct	---	3	(1.0)	-12	(-4.3)	-12	(-4.3)	4	(1.6)	-12	(-4.3)	-18	(-6.7)	-17	(-6.4)
Nov	---	5	(1.9)	-13	(-4.5)	-13	(-4.5)	5	(1.7)	-13	(-4.4)	-16	(-5.6)	-15	(-5.3)
Dec	---	8	(2.5)	9	(2.9)	9	(2.9)	7	(2.4)	7	(2.4)	0	(0.0)	3	(0.9)
Average	---	31	(10.1)	19	(6.3)	20	(6.4)	31	(10.2)	19	(6.1)	15	(5.0)	16	(5.3)

Table 269. Monthly Surface Area Overall Average – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	498	442	442	442	442	442	442	442
Feb	548	504	512	511	509	511	503	505
Mar	558	537	541	540	539	540	536	538
Apr	551	534	534	534	534	534	534	534
May	509	494	496	497	496	497	492	495
Jun	496	465	465	465	465	465	465	465
Jul	425	399	399	399	399	399	399	399
Aug	361	323	323	323	323	323	323	323
Sep	334	298	305	305	302	304	296	301
Oct	334	292	294	293	293	294	287	293
Nov	357	309	309	310	310	310	307	308
Dec	415	365	368	368	365	368	363	366
Average	449	413	416	416	415	416	412	414
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	1 (0.1)	1 (0.1)	0 (0.1)	1 (0.1)	0 (0.0)	0 (0.0)
Feb	---	---	8 (1.5)	7 (1.4)	5 (1.0)	7 (1.4)	-1 (-0.3)	1 (0.2)
Mar	---	---	4 (0.7)	4 (0.7)	2 (0.4)	4 (0.7)	0 (-0.1)	1 (0.3)
Apr	---	---	0 (0.1)	1 (0.1)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)
May	---	---	3 (0.6)	3 (0.6)	2 (0.5)	3 (0.6)	-2 (-0.4)	2 (0.3)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.0)
Sep	---	---	7 (2.4)	7 (2.2)	4 (1.4)	6 (2.0)	-2 (-0.8)	3 (0.8)
Oct	---	---	2 (0.8)	1 (0.2)	1 (0.4)	2 (0.7)	-5 (-1.8)	1 (0.4)
Nov	---	---	0 (0.0)	1 (0.3)	0 (0.1)	1 (0.3)	-2 (-0.6)	-1 (-0.2)
Dec	---	---	3 (0.9)	3 (0.9)	0 (0.1)	3 (0.9)	-1 (-0.4)	1 (0.3)
Average	---	---	2 (0.6)	2 (0.5)	1 (0.3)	2 (0.6)	-1 (-0.3)	1 (0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-56 (-11.3)	-56 (-11.2)	-56 (-11.2)	-56 (-11.2)	-56 (-11.2)	-56 (-11.3)	-56 (-11.3)
Feb	---	-44 (-8.0)	-36 (-6.6)	-37 (-6.8)	-39 (-7.1)	-37 (-6.8)	-45 (-8.3)	-43 (-7.8)
Mar	---	-22 (-3.9)	-18 (-3.2)	-18 (-3.2)	-19 (-3.4)	-18 (-3.2)	-22 (-3.9)	-20 (-3.6)
Apr	---	-17 (-3.2)	-17 (-3.1)	-17 (-3.1)	-17 (-3.2)	-17 (-3.1)	-18 (-3.2)	-18 (-3.2)
May	---	-15 (-3.0)	-13 (-2.5)	-12 (-2.4)	-13 (-2.6)	-12 (-2.4)	-17 (-3.4)	-14 (-2.7)
Jun	---	-31 (-6.3)	-31 (-6.2)	-31 (-6.2)	-31 (-6.2)	-31 (-6.2)	-31 (-6.3)	-31 (-6.2)
Jul	---	-27 (-6.3)	-27 (-6.2)	-27 (-6.3)	-26 (-6.2)	-27 (-6.2)	-27 (-6.3)	-27 (-6.3)
Aug	---	-38 (-10.6)	-38 (-10.5)	-38 (-10.5)	-38 (-10.5)	-38 (-10.5)	-38 (-10.6)	-38 (-10.6)
Sep	---	-35 (-10.6)	-28 (-8.5)	-29 (-8.6)	-31 (-9.4)	-29 (-8.8)	-38 (-11.3)	-33 (-9.8)
Oct	---	-42 (-12.6)	-40 (-11.9)	-41 (-12.4)	-41 (-12.2)	-40 (-12.0)	-47 (-14.2)	-41 (-12.2)
Nov	---	-47 (-13.3)	-47 (-13.3)	-47 (-13.0)	-47 (-13.2)	-47 (-13.0)	-49 (-13.8)	-48 (-13.5)
Dec	---	-50 (-12.1)	-47 (-11.3)	-47 (-11.3)	-50 (-12.0)	-47 (-11.3)	-52 (-12.5)	-49 (-11.9)
Average	---	-35 (-7.9)	-33 (-7.4)	-33 (-7.4)	-34 (-7.6)	-33 (-7.4)	-37 (-8.2)	-35 (-7.8)

Table 270. Monthly Surface Area Normal Year (2005) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	322	305		315		314		316		313		305		305	
Feb	394	439		505		503		506		503		408		425	
Mar	432	506		506		506		506		506		506		506	
Apr	461	510		510		510		510		510		510		510	
May	446	430		433		433		431		433		430		432	
Jun	386	206		206		206		206		206		206		206	
Jul	332	141		141		141		141		141		141		141	
Aug	342	93		94		94		95		94		93		93	
Sep	416	201		201		201		201		201		200		201	
Oct	489	250		250		250		250		250		250		250	
Nov	487	247		245		245		247		245		245		246	
Dec	475	208		208		208		208		208		208		208	
Average	415	295		301		301		301		301		292		293	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		10	(3.3)	9	(2.9)	11	(3.6)	9	(2.8)	1	(0.2)	1	(0.2)
Feb	---	---		65	(14.8)	64	(14.5)	66	(15.1)	63	(14.3)	-31	(-7.1)	-14	(-3.3)
Mar	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	---		3	(0.7)	3	(0.7)	0	(0.1)	3	(0.7)	0	(0.0)	2	(0.4)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		1	(1.5)	1	(1.0)	2	(2.4)	1	(1.2)	0	(0.0)	0	(0.0)
Sep	---	---		1	(0.3)	0	(-0.1)	0	(0.0)	0	(0.0)	-1	(-0.3)	0	(0.0)
Oct	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nov	---	---		-2	(-1.0)	-2	(-1.0)	0	(-0.1)	-2	(-1.0)	-2	(-1.0)	-1	(-0.4)
Dec	---	---		0	(0.2)	0	(0.1)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		7	(2.2)	6	(2.1)	7	(2.3)	6	(2.1)	-3	(-0.9)	-1	(-0.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-18	(-5.4)	-8	(-2.3)	-9	(-2.7)	-6	(-2.0)	-9	(-2.8)	-17	(-5.2)	-17	(-5.2)
Feb	---	46	(11.6)	111	(28.2)	110	(27.8)	112	(28.5)	109	(27.6)	15	(3.8)	31	(8.0)
Mar	---	73	(17.0)	73	(17.0)	74	(17.0)	74	(17.0)	73	(17.0)	74	(17.0)	73	(17.0)
Apr	---	49	(10.7)	49	(10.7)	49	(10.7)	49	(10.7)	49	(10.7)	49	(10.7)	49	(10.7)
May	---	-16	(-3.6)	-13	(-2.9)	-13	(-2.9)	-16	(-3.5)	-13	(-2.9)	-16	(-3.6)	-14	(-3.2)
Jun	---	-181	(-46.8)	-181	(-46.8)	-181	(-46.8)	-181	(-46.8)	-181	(-46.8)	-181	(-46.8)	-181	(-46.8)
Jul	---	-191	(-57.6)	-191	(-57.6)	-191	(-57.6)	-191	(-57.6)	-191	(-57.6)	-191	(-57.6)	-191	(-57.6)
Aug	---	-249	(-72.8)	-247	(-72.4)	-248	(-72.6)	-247	(-72.2)	-248	(-72.5)	-249	(-72.8)	-249	(-72.8)
Sep	---	-215	(-51.7)	-214	(-51.5)	-215	(-51.7)	-215	(-51.7)	-215	(-51.7)	-216	(-51.8)	-215	(-51.7)
Oct	---	-240	(-49.0)	-240	(-49.0)	-240	(-49.0)	-240	(-49.0)	-240	(-49.0)	-240	(-49.0)	-240	(-49.0)
Nov	---	-240	(-49.2)	-242	(-49.7)	-242	(-49.7)	-240	(-49.3)	-242	(-49.7)	-242	(-49.7)	-241	(-49.5)
Dec	---	-267	(-56.3)	-267	(-56.2)	-267	(-56.2)	-267	(-56.3)	-267	(-56.3)	-267	(-56.3)	-267	(-56.3)
Average	---	-121	(-29.1)	-114	(-27.5)	-114	(-27.6)	-114	(-27.4)	-115	(-27.6)	-123	(-29.7)	-122	(-29.3)

Table 271. Monthly Surface Area Wet Year (1997) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	613	594		595		595		594		595		595		595	
Feb	625	608		608		608		608		608		608		608	
Mar	621	614		614		614		614		614		614		614	
Apr	632	632		632		632		632		632		632		632	
May	660	660		660		660		660		660		660		660	
Jun	660	660		660		660		660		660		660		660	
Jul	647	647		647		647		647		647		647		647	
Aug	649	648		648		648		648		648		648		648	
Sep	474	473		473		473		473		473		473		473	
Oct	328	320		322		322		321		322		322		323	
Nov	360	347		348		348		347		348		348		348	
Dec	584	579		579		579		579		579		579		579	
Average	571	565		565		565		565		566		565		566	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		2	(0.7)	2	(0.6)	0	(0.1)	2	(0.7)	2	(0.7)	3	(0.9)
Nov	---	---		1	(0.2)	1	(0.2)	0	(0.0)	1	(0.2)	1	(0.1)	1	(0.2)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	-19	(-3.0)	-18	(-3.0)	-18	(-3.0)	-19	(-3.0)	-18	(-3.0)	-18	(-3.0)	-18	(-3.0)
Feb	---	-17	(-2.7)	-17	(-2.7)	-17	(-2.7)	-17	(-2.7)	-17	(-2.7)	-17	(-2.7)	-17	(-2.7)
Mar	---	-8	(-1.3)	-8	(-1.3)	-8	(-1.3)	-8	(-1.3)	-8	(-1.3)	-8	(-1.3)	-8	(-1.3)
Apr	---	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)
May	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)	-1	(-0.1)
Sep	---	-1	(-0.2)	-1	(-0.1)	-1	(-0.2)	-1	(-0.2)	-1	(-0.2)	-1	(-0.1)	-1	(-0.2)
Oct	---	-8	(-2.5)	-6	(-1.8)	-6	(-1.9)	-8	(-2.3)	-6	(-1.8)	-6	(-1.8)	-5	(-1.6)
Nov	---	-13	(-3.5)	-12	(-3.3)	-12	(-3.3)	-13	(-3.5)	-12	(-3.3)	-12	(-3.4)	-12	(-3.3)
Dec	---	-5	(-0.8)	-5	(-0.8)	-5	(-0.8)	-5	(-0.8)	-5	(-0.8)	-5	(-0.8)	-5	(-0.8)
Average	---	-6	(-1.0)	-6	(-1.0)	-6	(-1.0)	-6	(-1.0)	-6	(-1.0)	-6	(-1.0)	-6	(-1.0)

Table 272. Monthly Surface Area Dry Year (2004) – Holbrook Reservoir (Cumulative Effects).

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Surface Area (acres)															
Jan	356	492		493		493		492		493		491		493	
Feb	374	495		495		495		495		495		495		495	
Mar	372	487		487		487		487		487		487		487	
Apr	395	473		475		475		472		475		472		473	
May	296	415		416		416		412		416		373		421	
Jun	243	215		215		215		215		215		214		215	
Jul	253	226		227		227		226		227		227		226	
Aug	261	239		240		240		240		240		239		239	
Sep	280	250		250		250		250		250		250		250	
Oct	272	255		256		256		255		256		256		256	
Nov	284	268		268		268		268		269		268		268	
Dec	307	295		295		295		295		295		295		295	
Average	308	343		343		343		342		343		339		343	
Change in Surface Area Compared to No Action [acres (%)]															
Jan	---	---		0	(0.1)	0	(0.1)	0	(0.0)	0	(0.1)	-2	(-0.3)	0	(0.1)
Feb	---	---		1	(0.1)	1	(0.1)	0	(0.0)	1	(0.1)	0	(0.1)	0	(0.1)
Mar	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		2	(0.3)	2	(0.3)	-2	(-0.3)	2	(0.3)	-1	(-0.3)	-1	(-0.1)
May	---	---		0	(0.0)	0	(0.0)	-3	(-0.8)	0	(0.0)	-43	(-10.3)	6	(1.4)
Jun	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(-0.1)	0	(0.0)
Jul	---	---		0	(0.2)	0	(0.2)	0	(0.0)	1	(0.2)	0	(0.1)	0	(0.0)
Aug	---	---		1	(0.2)	1	(0.3)	1	(0.2)	1	(0.3)	0	(0.0)	0	(0.0)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		0	(0.1)	0	(0.2)	0	(0.0)	1	(0.2)	0	(0.1)	0	(0.1)
Nov	---	---		0	(0.1)	0	(0.1)	0	(0.0)	1	(0.2)	0	(0.1)	0	(0.1)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		0	(0.1)	0	(0.1)	0	(-0.1)	0	(0.1)	-4	(-1.1)	1	(0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]															
Jan	---	136	(38.2)	137	(38.3)	137	(38.3)	136	(38.2)	137	(38.3)	135	(37.8)	137	(38.3)
Feb	---	121	(32.2)	121	(32.4)	121	(32.4)	121	(32.3)	121	(32.4)	121	(32.3)	121	(32.3)
Mar	---	115	(30.9)	115	(30.9)	115	(30.9)	115	(30.9)	115	(30.9)	115	(30.9)	115	(30.9)
Apr	---	79	(19.9)	80	(20.3)	80	(20.3)	77	(19.6)	80	(20.3)	78	(19.6)	78	(19.8)
May	---	120	(40.6)	120	(40.6)	120	(40.6)	117	(39.5)	120	(40.6)	77	(26.1)	126	(42.5)
Jun	---	-28	(-11.6)	-28	(-11.6)	-28	(-11.6)	-28	(-11.6)	-28	(-11.6)	-29	(-11.7)	-28	(-11.6)
Jul	---	-27	(-10.6)	-26	(-10.4)	-26	(-10.4)	-27	(-10.6)	-26	(-10.4)	-27	(-10.5)	-27	(-10.5)
Aug	---	-22	(-8.5)	-22	(-8.3)	-22	(-8.3)	-22	(-8.3)	-22	(-8.3)	-22	(-8.5)	-22	(-8.5)
Sep	---	-29	(-10.5)	-29	(-10.5)	-29	(-10.5)	-29	(-10.5)	-29	(-10.5)	-29	(-10.5)	-29	(-10.5)
Oct	---	-17	(-6.1)	-16	(-6.0)	-16	(-6.0)	-17	(-6.1)	-16	(-5.9)	-16	(-6.0)	-16	(-6.0)
Nov	---	-16	(-5.5)	-15	(-5.4)	-15	(-5.4)	-16	(-5.5)	-15	(-5.3)	-15	(-5.4)	-15	(-5.4)
Dec	---	-12	(-4.0)	-12	(-4.0)	-12	(-4.0)	-12	(-4.0)	-12	(-4.0)	-12	(-4.0)	-12	(-4.0)
Average	---	35	(11.4)	35	(11.5)	35	(11.5)	35	(11.2)	35	(11.5)	31	(10.1)	35	(11.5)

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Appendix D.5 - Other Surface Water Hydrology Analyses

Introduction

This appendix presents the effects analyses for the West Slope study area, Grape Creek, the study area downstream from John Martin Reservoir, and transit losses downstream from Pueblo Reservoir.

West Slope Analysis

Streamflow in the headwater region of the Colorado River Basin on the west slope of the Continental Divide could be affected by changes in transmountain imports through the Boustead Tunnel, Busk-Ivanhoe Tunnel, Homestake Tunnel and Twin Lakes Tunnel. None of the alternatives were developed specifically to divert more water from the West Slope. Changes in the quantity and timing of water stored in East Slope reservoirs results in differences in the amount of water diverted from the West Slope among alternatives, which would affect streamflow and reservoir contents on the West Slope.

The Surface Water Hydrologic Daily Model described in Appendix D.4 simulates potential transmountain imports through these facilities, but does not simulate streamflow downstream from the diversion structures on the West Slope for these facilities. The changes in transmountain imports were translated into changes in streamflow using the methods described in this Appendix.

Methods

The study area for the West Slope analysis is described in Chapter 1 of the EIS, and incorporates tributaries affected by the Fry-Ark collection system, including the Fryingpan River (upstream from Ruedi Reservoir) and Hunter Creek (a tributary to the Roaring Fork River) (Figure 1). Changes in transmountain imports for other transmountain systems simulated in the Daily Model, including the Busk-Ivanhoe Tunnel, Homestake Tunnel and Twin Lakes Tunnel, were also translated into changes in streamflow based on results of the Daily Model to verify whether these locations should be included in the AVC EIS study area. The results for all analyses are in this section of the Appendix.

To assess effects on streamflow from changes in transmountain diversions, streamflow was estimated for existing conditions and for each of the alternatives at USGS gaging stations immediately downstream from the collection and diversion systems within the hydrologic study area (Figure 1). The gages listed below were selected for simulation of streamflow downstream from the transmountain systems. These locations were chosen because these are the closest downstream gages in basins affected by changes in transmountain diversions with adequate data for this analysis. Effects in tributary streams upstream from these gages would be approximately the same percentage as those calculated at the gages.

- Fryingpan River at Thomasville (USGS Station No. 09078600): Fry-Ark and Busk-Ivanhoe
- Hunter Creek near Aspen (USGS Station No. 09074000): Fry-Ark
- Roaring Fork above Difficult Creek near Aspen (USGS Station No. 09073300): Twin Lakes Project
- Roaring Fork below Maroon Creek near Aspen (Colorado Division of Water Resources Station No. ROABMCCO; data available 1988-01-01 to 2009-12-31 only): Fry-Ark and Twin Lakes Project
- Homestake Creek at Gold Park (USGS Station No. 09064000): Homestake Project

In addition to streamflow, transmountain diversions could also affect storage in Ruedi Reservoir, which is located on the Fryingpan River downstream from the Thomasville gage, and Homestake Reservoir, which is located on Homestake Creek upstream from the Gold Park gage. Homestake Reservoir is directly simulated in the Surface Water Hydrologic Daily Model, which is documented in Appendix D.3. Ruedi Reservoir is outside of the study area, and thus only a qualitative description of effects on this reservoir is presented.

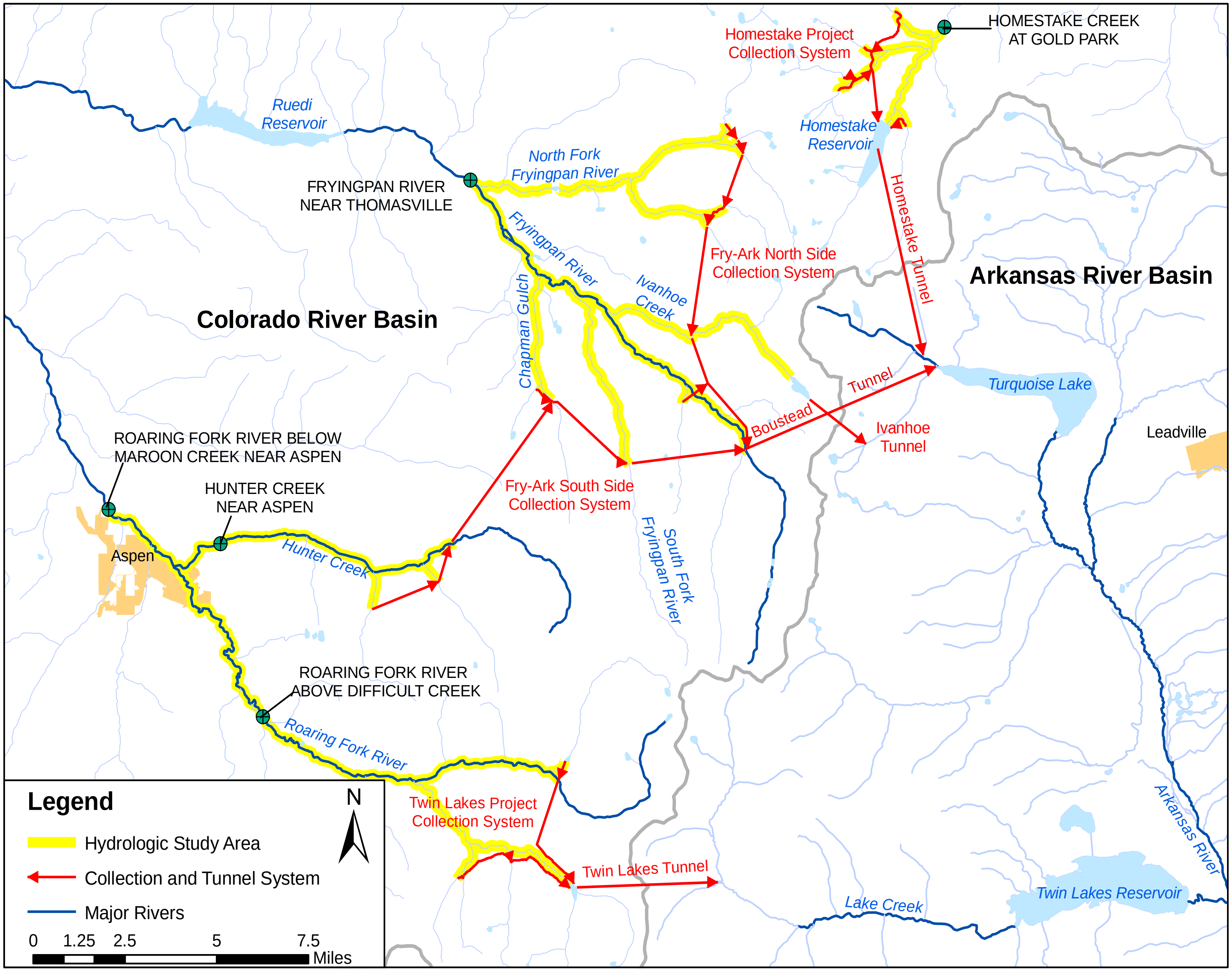


Figure 1. **Transmountain Diversions and West Slope Streams**

Historical undepleted streamflow at each gage was approximated by adding estimated daily historical diversions for the collection systems back into the daily historical gaged streamflow. The simulated daily transmountain diversions for the collection systems were then subtracted from the daily historical undepleted streamflow. In the case of the Homestake Creek at Gold Park gage, which is downstream from Homestake Reservoir, "spills" from Homestake Reservoir (or potential diversions into the reservoir that cannot be stored or delivered through the Homestake Tunnel) from the historical long-term calibration run and the alternatives were used in place of collection system diversions representing a change in reservoir releases from historical conditions.

For Fry-Ark diversions, daily historical and simulated diversions were pro-rated to portions of the collection systems affecting the Fryingpan and Hunter Creek gages based on historical monthly diversions through the collection system from diversion data in the Fryingpan-Arkansas Project Annual Operating Plan (Reclamation 2009). Calculated diversions from Hunter Creek and the Fryingpan River were limited based on required instream flows below the diversion structures (see Appendix D.1). Because streamflow on Hunter Creek is less than streamflow on the Fryingpan River, calculations were performed on Hunter Creek first. Any diversions that would cause streamflow to be reduced to less than bypass flow downstream from the gage were assumed to be diverted from the Fryingpan River, within its bypass flow constraints. Approximately 0.5 percent of Hunter Creek diversions were adjusted to the Fryingpan River based on this methodology.

Calculated reductions in reservoir releases from Homestake Reservoir were limited based on the 24 cfs minimum bypass flow for the Gold Park gage (CWCB 2007). Simulated diversions by the Twin Lakes Project were limited to bypass flow requirements for Lincoln Creek and Roaring Fork below the Twin Lakes Project diversions (Reclamation 2009; see Appendix D.1). Simulated Twin Lakes Project diversions typically are not affected by these flow requirements in this analysis, because the gages are downstream from the diversion structures and have inflows within the intervening reach. The development of all transmountain import datasets (including Twin Lakes, Homestake and Fry-Ark projects) take in to consideration the by-pass flow requirements at each diversion structure, thus the model implicitly does not allow transmountain diversions when these flow requirements could not be met.

The Twin Lakes and Fry-Ark transmountain diversion sets used in the Daily Model are "net diversions" after consideration of an exchange between the Twin Lakes Reservoir and Canal Company and Fry-Ark of up to 3,000 acre-feet per year (see Appendix D.1). For purposes of this analysis, because the relative difference between existing conditions and alternatives would not be affected, adjustments were not made between the "net" transmountain diversions and physical diversions. Thus, simulated streamflow could be up to 8 cfs greater than that shown for the Roaring Fork gages during drier periods when bypasses are taking place, and up to 8 cfs less split between the Fryingpan River and/or Hunter Creek gages during wetter periods when additional diversions are made for "payback" on the East Slope (limited to 3,000 acre-feet per year).

Results

Direct and cumulative effects of alternatives on streamflow and reservoir storage are presented in this section. Consistent with the definition of direct and cumulative effects described in Chapter 4 of the EIS, direct and cumulative effects are calculated in comparison with the No Action Alternative. Comparisons with existing conditions are also in the tables, but were not used to determine effects.

Summaries of West Slope direct and cumulative surface water hydrologic effects are presented in Table 1 and Table 2. Average monthly, typical normal-year, dry-year and wet-year (consistent with the "typical-year" designations developed in Appendix D.4), and annual data are presented in the following sub-sections for each location. Throughout this section, graphs showing simulated daily streamflow for selected alternatives are provided as examples of how streamflow is affected on a daily basis during certain years. These graphs are not shown for every year of the simulation, but just during years as determined necessary to illustrate hydrologic differences.

Table 1. Average Annual Streamflow – West Slope Gages (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs) or Storage (ac-ft)								
Fryingpan River near Thomasville (cfs)	113	113	113	113	113	113	113	114
Hunter Creek near Aspen (cfs)	42	42	42	42	42	42	42	42
Roaring Fork above Difficult Creek (cfs)	69	69	69	69	69	69	69	69
Roaring Fork below Maroon Creek (cfs)	312	312	312	312	312	312	312	312
Homestake Creek at Gold Park (cfs)	31	31	31	31	31	31	31	31
Homestake Reservoir (ac-ft)	29,058	28,988	28,975	28,960	29,041	28,982	28,970	28,953
Change in Flow or Storage Compared to No Action [cfs or ac-ft (%)]								
Fryingpan River near Thomasville (cfs)	-	-	0 (0.0)	0 (0.0)	0 (-0.4)	0 (0.0)	0 (0.1)	1 (0.5)
Hunter Creek near Aspen (cfs)	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.1)	0 (0.1)	0 (0.2)
Roaring Fork above Difficult Creek (cfs)	-	-	0 (-0.3)	0 (-0.2)	0 (-0.1)	0 (-0.3)	0 (-0.2)	0 (0.0)
Roaring Fork below Maroon Creek (cfs)	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Homestake Creek at Gold Park (cfs)	-	-	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)
Homestake Reservoir (ac-ft)	-	-	-13 (0.0)	-28 (-0.1)	53 (0.2)	-6 (0.0)	-18 (-0.1)	-35 (-0.1)
Change in Flow or Storage Compared to Existing Conditions [cfs or ac-ft (%)]								
Fryingpan River near Thomasville (cfs)	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (-0.4)	0 (0.0)	0 (0.1)	1 (0.5)
Hunter Creek near Aspen (cfs)	-	0 (0.0)	0 (0.1)	0 (0.0)	0 (-0.1)	0 (0.1)	0 (0.1)	0 (0.2)
Roaring Fork above Difficult Creek (cfs)	-	0 (0.2)	0 (-0.1)	0 (0.0)	0 (0.1)	0 (-0.1)	0 (0.0)	0 (0.2)
Roaring Fork below Maroon Creek (cfs)	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Homestake Creek at Gold Park (cfs)	-	0 (-0.3)	0 (-0.3)	0 (-0.3)	0 (-0.2)	0 (-0.3)	0 (-0.2)	0 (-0.2)
Homestake Reservoir (ac-ft)	-	-70 (-0.2)	-83 (-0.3)	-98 (-0.3)	-17 (-0.1)	-75 (-0.3)	-88 (-0.3)	-105 (-0.4)

Table 2. Average Annual Streamflow – West Slope Gages (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs) or Storage (ac-ft)								
Fryingpan River near Thomasville (cfs)	113	105	105	105	104	105	105	106
Hunter Creek near Aspen (cfs)	42	42	42	42	42	42	42	42
Roaring Fork above Difficult Creek (cfs)	69	65	64	64	64	64	65	64
Roaring Fork below Maroon Creek (cfs)	312	307	306	306	306	306	307	306
Homestake Creek at Gold Park (cfs)	31	28	28	28	28	28	28	28
Homestake Reservoir (ac-ft)	29,058	25,628	25,641	25,572	25,509	25,626	25,526	25,517
Change in Flow or Storage Compared to No Action [cfs or ac-ft (%)]								
Fryingpan River near Thomasville (cfs)	-	-	0 (0.2)	0 (0.1)	0 (-0.3)	0 (0.2)	0 (0.3)	1 (1.0)
Hunter Creek near Aspen (cfs)	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.1)
Roaring Fork above Difficult Creek (cfs)	-	-	0 (-0.6)	0 (-0.5)	0 (-0.7)	0 (-0.7)	0 (-0.4)	-1 (-0.9)
Roaring Fork below Maroon Creek (cfs)	-	-	0 (-0.2)	0 (-0.1)	0 (-0.1)	0 (-0.2)	0 (-0.1)	0 (-0.1)
Homestake Creek at Gold Park (cfs)	-	-	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.8)
Homestake Reservoir (ac-ft)	-	-	13 (0.0)	-56 (-0.2)	-119 (-0.5)	-3 (0.0)	-102 (-0.4)	-111 (-0.4)
Change in Flow or Storage Compared to Existing Conditions [cfs or ac-ft (%)]								
Fryingpan River near Thomasville (cfs)	-	-9 (-7.6)	-8 (-7.4)	-9 (-7.5)	-9 (-7.9)	-8 (-7.4)	-8 (-7.4)	-8 (-6.7)
Hunter Creek near Aspen (cfs)	-	0 (-0.9)	0 (-0.9)	0 (-0.9)	0 (-1.0)	0 (-0.9)	0 (-0.9)	0 (-0.8)
Roaring Fork above Difficult Creek (cfs)	-	-5 (-6.5)	-5 (-7.1)	-5 (-7.0)	-5 (-7.1)	-5 (-7.2)	-5 (-6.9)	-5 (-7.3)
Roaring Fork below Maroon Creek (cfs)	-	-5 (-1.5)	-5 (-1.7)	-5 (-1.7)	-5 (-1.7)	-5 (-1.7)	-5 (-1.6)	-5 (-1.7)
Homestake Creek at Gold Park (cfs)	-	-4 (11.6)	-4 (11.5)	-4 (11.5)	-4 (11.5)	-4 (11.5)	-4 (11.5)	-3 (10.9)
Homestake Reservoir (ac-ft)	-	-3,430 (-11.8)	-3,417 (-11.8)	-3,486 (-12.0)	-3,548 (-12.2)	-3,432 (-11.8)	-3,531 (-12.2)	-3,540 (-12.2)

Streamflow estimates are no more accurate than 1 cfs due to streamflow measurement techniques used at USGS gaging stations and approximate methods used to calculate streamflow and subsequent hydrologic effects on the West Slope. Streamflow and effects values are rounded to 1 cfs to reflect this accuracy level. Effects percentages were calculated based on unrounded values to show relative differences between simulated values. These percentages may show effects when absolute values show no effects. Effects on water-dependent resources within the West Slope study area were evaluated qualitatively using the hydrologic information and can be found in their respective appendices.

Fryingpan River

Streamflow in the Fryingpan River Basin is primarily influenced by diversions from the Fry-Ark collection system. Diversions through the Busk-Ivanhoe Tunnel influence flows in Ivanhoe Creek, which is tributary to the Fryingpan River just upstream from the Thomasville gage. Streamflow effects were analyzed for the Fryingpan River near Thomasville gage. Effects in the smaller tributaries downstream from the Fry-Ark collection system diversion points would be approximately the same percentage as those at the Thomasville gage.

Fryingpan River at Thomasville

Mean monthly streamflow direct effects for the Fryingpan River at Thomasville gage are negligible except for July and August of the Joint Use Pipeline North Alternative (Table 3). The Joint Use Pipeline North Alternative results in a minor decrease in streamflow during July and a negligible increase in streamflow during August when compared to the No Action Alternative. This occurs because increased use of Fry-Ark allocations in this alternative result in increased diversions earlier in the season during wet years to fill Fry-Ark storage space. Lower diversions are then made later in the summer resulting in

higher streamflow. Simulated monthly direct effects are negligible during typical normal (2005), wet (1997) and dry (2004) years (Table 4,
Table 5 and Table 6, respectively).

Annual simulated direct effects are negligible to minor (
Table 7). Most years show at least negligible effects due to slight differences in Busk-Ivanhoe Tunnel diversions caused by differences in storage availability on the East Slope. Some alternatives show years with minor effects, primarily occurring during wet years and some normal years following wet years on the East Slope. These effects occur due to differences in the timing of diversions from the West Slope to the East Slope based on storage availability.

Simulated daily runoff-season streamflow for the No Action, Comanche South, Joint Use Pipeline North and Master Contract Only alternatives provide an example of how streamflow is affected on a daily basis. In 1986, three alternatives (Pueblo Dam South, River South and Master Contract Only) show minor increases in average annual streamflow (
Table 7). These differences typically occur in mid-July, as storage on the East Slope fills faster for these alternatives than the No Action Alternative (Figure 2). In 1996, all alternatives result in negligible decreases in annual streamflow. Decreases are most pronounced early in the runoff season, as more storage space is available on the East Slope to store Fry-Ark diversions for all alternatives other than for the No Action Alternative due to increased use of Fry-Ark for AVC and well augmentation (Figure 3).

Table 3. Mean Monthly Streamflow Overall Average– Fryingpan River at Thomasville (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	26	26	26	26	26	26	26	26
Feb	25	25	25	25	25	25	25	25
Mar	33	33	33	33	33	33	33	33
Apr	96	96	96	96	96	96	96	96
May	292	293	292	292	291	292	292	293
Jun	412	412	412	412	411	413	413	415
Jul	197	197	198	197	193	197	197	200
Aug	89	87	87	88	88	87	88	89
Sep	62	62	62	62	62	62	62	62
Oct	55	55	55	55	55	55	55	55
Nov	39	39	39	39	39	39	39	39
Dec	31	31	31	31	31	31	31	31
Average	113	113	113	113	113	113	113	114
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	-1 (-0.3)	-1 (-0.3)	-2 (-0.7)	-1 (-0.3)	-1 (-0.4)	-1 (-0.2)
Jun	-	-	0 (0.0)	-1 (-0.1)	-1 (-0.2)	1 (0.1)	1 (0.2)	2 (0.6)
Jul	-	-	1 (0.5)	0 (0.2)	-4 (-2.0)	0 (-0.2)	0 (0.1)	3 (1.6)
Aug	-	-	0 (0.4)	1 (1.5)	2 (1.8)	1 (0.9)	1 (1.5)	2 (2.4)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Average	-	-	0 (0.0)	0 (0.0)	0 (-0.4)	0 (0.0)	0 (0.1)	1 (0.5)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	2 (0.6)	1 (0.2)	1 (0.2)	0 (-0.1)	1 (0.2)	1 (0.2)	1 (0.3)
Jun	-	0 (0.0)	0 (0.0)	-1 (-0.1)	-1 (-0.2)	1 (0.2)	1 (0.2)	2 (0.6)
Jul	-	0 (0.0)	1 (0.5)	1 (0.3)	-4 (-2.0)	0 (-0.2)	0 (0.1)	3 (1.6)
Aug	-	-2 (-2.2)	-2 (-1.8)	-1 (-0.7)	0 (-0.4)	-1 (-1.3)	-1 (-0.8)	0 (0.1)
Sep	-	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (-0.4)	0 (0.0)	0 (0.1)	1 (0.5)

Table 4. Monthly Streamflow Normal Year (2005) – Fryingpan River at Thomasville (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	22	22	22	22	22	22	22	22
Feb	22	22	22	22	22	22	22	22
Mar	24	24	24	24	24	24	24	24
Apr	87	87	87	87	87	87	87	87
May	267	267	267	267	267	267	267	267
Jun	261	261	261	261	261	261	261	261
Jul	133	133	133	133	133	133	133	133
Aug	84	84	84	84	84	84	84	84
Sep	46	46	46	46	46	46	46	46
Oct	71	71	71	71	71	71	71	71
Nov	54	54	54	54	54	54	54	54
Dec	38	38	38	38	38	38	38	38
Average	93	93	93	93	93	93	93	93
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (-0.1)	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 5. Monthly Streamflow Wet Year (1997) – Fryingpan River at Thomasville (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	35	35	35	35	35	35	35	35
Feb	31	31	31	31	31	31	31	31
Mar	54	54	54	54	54	54	54	54
Apr	90	90	90	90	90	90	90	90
May	281	281	278	280	281	278	277	280
Jun	561	561	561	561	561	561	561	561
Jul	171	171	171	171	171	171	171	171
Aug	95	95	95	95	95	95	95	95
Sep	82	82	82	82	82	82	82	82
Oct	77	77	77	77	77	77	77	77
Nov	49	49	49	49	49	49	49	49
Dec	37	37	37	37	37	37	37	37
Average	130	130	130	130	130	130	130	130
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.1)	0 (0.1)	0 (-0.2)	0 (0.1)	0 (0.1)	0 (0.1)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)
May	-	-	-3 (-1.0)	-1 (-0.2)	0 (0.0)	-3 (-1.1)	-4 (-1.3)	-1 (-0.3)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (-0.2)	0 (0.0)	0 (0.0)	0 (-0.2)	0 (-0.2)	0 (-0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.3)	0 (-0.1)	0 (-0.1)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Apr	-	0 (-0.1)	0 (-0.3)	0 (-0.3)	0 (-0.1)	0 (-0.3)	0 (-0.3)	0 (-0.3)
May	-	0 (0.0)	-3 (-1.0)	-1 (-0.2)	0 (0.0)	-3 (-1.1)	-4 (-1.3)	-1 (-0.3)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (-0.2)	0 (-0.1)	0 (0.0)	0 (-0.2)	0 (-0.3)	0 (-0.1)

Table 6. Monthly Streamflow Dry Year (2004) – Fryingpan River at Thomasville (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	21	21	21	21	21	21	21	21
Feb	20	20	20	20	20	20	20	20
Mar	43	43	43	43	43	43	43	43
Apr	96	96	96	96	96	96	96	96
May	198	198	198	198	198	198	198	198
Jun	259	254	256	256	254	256	256	256
Jul	123	123	123	123	123	123	123	123
Aug	50	50	50	50	50	50	50	50
Sep	35	35	35	35	35	35	35	35
Oct	37	37	37	37	37	37	37	37
Nov	29	29	29	29	29	29	29	29
Dec	24	24	24	24	24	24	24	24
Average	78	78	78	78	78	78	78	78
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.2)	0 (0.2)	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.2)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	2 (0.9)	2 (0.9)	0 (0.0)	2 (0.9)	2 (0.9)	2 (0.9)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.2)	0 (0.2)	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.2)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.2)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Jun	-	-4 (-1.7)	-2 (-0.9)	-2 (-0.9)	-4 (-1.7)	-2 (-0.9)	-2 (-0.9)	-2 (-0.9)
Jul	-	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (-0.4)	0 (-0.4)	0 (-0.4)	0 (-0.4)	0 (-0.4)	0 (-0.4)	0 (-0.4)
Nov	-	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (-0.5)	0 (-0.3)	0 (-0.3)	0 (-0.5)	0 (-0.3)	0 (-0.3)	0 (-0.3)

Table 7. Simulated Annual Streamflow – Fryingpan River at Thomasville (Direct Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	76,828	75,541	75,340	75,374	75,632	76,158	76,470	76,484
1983	Avg	99,961	100,306	100,402	100,400	100,546	100,397	99,963	99,957
1984	Wet	135,537	137,443	137,304	136,053	132,731	135,232	134,651	137,830
1985	Avg	113,568	114,867	113,341	113,317	113,353	113,185	113,372	115,073
1986	Wet	88,191	88,206	89,719	90,268	87,291	89,593	91,032	91,840
1987	Avg	101,801	101,331	102,011	101,967	100,684	102,013	101,943	102,147
1988	Dry	60,815	60,635	60,461	60,461	60,647	60,462	60,466	60,648
1989	Dry	56,588	56,449	56,475	56,475	56,431	56,474	56,475	56,495
1990	Dry	56,589	56,421	56,088	56,041	56,270	56,090	56,227	56,299
1991	Avg	66,083	65,999	66,018	65,977	66,002	65,996	66,016	66,029
1992	Avg	60,559	60,523	60,524	60,525	60,512	60,533	60,533	60,528
1993	Wet	97,054	96,991	96,993	96,993	96,569	96,994	97,007	96,917
1994	Avg	63,226	63,207	63,224	63,222	63,187	63,221	63,220	63,218
1995	Wet	128,677	124,335	125,089	126,739	125,971	125,827	126,759	128,731
1996	Wet	97,548	101,340	99,871	99,812	99,728	100,101	99,710	100,087
1997	Wet	93,918	93,904	93,712	93,855	93,900	93,703	93,659	93,837
1998	Avg	76,997	76,896	76,998	76,998	76,995	76,998	76,998	76,957
1999	Avg	100,263	100,762	101,980	101,005	99,640	102,190	102,636	103,505
2000	Dry	91,740	91,655	91,572	91,591	91,686	91,585	91,574	91,599
2001	Avg	67,996	67,999	67,955	67,968	67,983	67,969	67,981	67,968
2002	Dry	46,018	46,005	45,846	45,842	45,936	45,802	45,898	45,941
2003	Avg	68,096	66,888	66,987	66,891	66,963	66,973	66,903	67,071
2004	Dry	56,521	56,230	56,363	56,363	56,229	56,363	56,363	56,365
2005	Avg	62,741	62,732	62,745	62,745	62,732	62,745	62,731	62,745
2006	Avg	82,553	82,520	82,517	82,514	82,520	82,514	82,519	82,525
2007	Dry	70,353	70,345	70,346	70,346	70,344	70,346	70,349	70,346
2008	Wet	99,099	99,259	99,242	99,236	99,259	99,238	99,207	99,196
2009	Avg	77,077	77,198	77,222	77,221	77,209	77,223	77,215	77,201
Average		82,014	82,000	82,012	82,007	81,677	81,997	82,067	82,412
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	-202 (-0.3)	-167 (-0.2)	91 (0.1)	617 (0.8)	929 (1.2)	943 (1.2)
1983	Avg	-	-	96 (0.1)	94 (0.1)	240 (0.2)	90 (0.1)	-343 (-0.3)	-349 (-0.3)
1984	Wet	-	-	-138 (-0.1)	-1,389 (-1.0)	-4,712 (-3.4)	-2,211 (-1.6)	-2,791 (-2.0)	388 (0.3)
1985	Avg	-	-	-1,526 (-1.3)	-1,549 (-1.3)	-1,514 (-1.3)	-1,681 (-1.5)	-1,494 (-1.3)	206 (0.2)
1986	Wet	-	-	1,513 (1.7)	2,062 (2.3)	-915 (-1.0)	1,387 (1.6)	2,826 (3.2)	3,634 (4.1)
1987	Avg	-	-	680 (0.7)	636 (0.6)	-647 (-0.6)	681 (0.7)	611 (0.6)	816 (0.8)
1988	Dry	-	-	-174 (-0.3)	-174 (-0.3)	12 (0.0)	-173 (-0.3)	-169 (-0.3)	13 (0.0)
1989	Dry	-	-	27 (0.0)	26 (0.0)	-18 (0.0)	25 (0.0)	27 (0.0)	47 (0.1)
1990	Dry	-	-	-333 (-0.6)	-380 (-0.7)	-151 (-0.3)	-331 (-0.6)	-193 (-0.3)	-121 (-0.2)
1991	Avg	-	-	19 (0.0)	-22 (0.0)	3 (0.0)	-3 (0.0)	17 (0.0)	30 (0.0)
1992	Avg	-	-	1 (0.0)	3 (0.0)	-10 (0.0)	10 (0.0)	10 (0.0)	5 (0.0)
1993	Wet	-	-	2 (0.0)	2 (0.0)	-422 (-0.4)	2 (0.0)	16 (0.0)	-74 (-0.1)
1994	Avg	-	-	17 (0.0)	14 (0.0)	-21 (0.0)	13 (0.0)	13 (0.0)	11 (0.0)
1995	Wet	-	-	755 (0.6)	2,404 (1.9)	1,636 (1.3)	1,493 (1.2)	2,424 (1.9)	4,396 (3.5)
1996	Wet	-	-	-1,469 (-1.4)	-1,528 (-1.5)	-1,612 (-1.6)	-1,239 (-1.2)	-1,630 (-1.6)	-1,253 (-1.2)
1997	Wet	-	-	-192 (-0.2)	-49 (-0.1)	-4 (0.0)	-202 (-0.2)	-245 (-0.3)	-67 (-0.1)
1998	Avg	-	-	102 (0.1)	101 (0.1)	99 (0.1)	101 (0.1)	102 (0.1)	60 (0.1)
1999	Avg	-	-	1,217 (1.2)	242 (0.2)	-1,123 (-1.1)	1,428 (1.4)	1,874 (1.9)	2,742 (2.7)
2000	Dry	-	-	-83 (-0.1)	-64 (-0.1)	32 (0.0)	-70 (-0.1)	-81 (-0.1)	-55 (-0.1)
2001	Avg	-	-	-44 (-0.1)	-31 (0.0)	-16 (0.0)	-30 (0.0)	-18 (0.0)	-31 (0.0)
2002	Dry	-	-	-159 (-0.3)	-164 (-0.4)	-69 (-0.2)	-203 (-0.4)	-107 (-0.2)	-65 (-0.1)
2003	Avg	-	-	99 (0.1)	2 (0.0)	74 (0.1)	85 (0.1)	14 (0.0)	182 (0.3)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	133 (0.2)	133 (0.2)	-1 (0.0)	133 (0.2)	133 (0.2)	135 (0.2)
2005	Avg	-	-	12 (0.0)	12 (0.0)	0 (0.0)	12 (0.0)	-1 (0.0)	12 (0.0)
2006	Avg	-	-	-3 (0.0)	-5 (0.0)	0 (0.0)	-5 (0.0)	-1 (0.0)	5 (0.0)
2007	Dry	-	-	1 (0.0)	1 (0.0)	-1 (0.0)	1 (0.0)	4 (0.0)	1 (0.0)
2008	Wet	-	-	-16 (0.0)	-23 (0.0)	0 (0.0)	-21 (0.0)	-52 (-0.1)	-63 (-0.1)
2009	Avg	-	-	24 (0.0)	23 (0.0)	11 (0.0)	25 (0.0)	17 (0.0)	3 (0.0)
Average		-	-	13 (0.0)	8 (0.0)	-323 (-0.4)	-2 (0.0)	67 (0.1)	413 (0.5)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	-1,287 (-1.7)	-1,488 (-1.9)	-1,454 (-1.9)	-1,196 (-1.6)	-670 (-0.9)	-358 (-0.5)	-344 (-0.4)
1983	Avg	-	345 (0.3)	441 (0.4)	439 (0.4)	584 (0.6)	435 (0.4)	2 (0.0)	-4 (0.0)
1984	Wet	-	1,906 (1.4)	1,768 (1.3)	517 (0.4)	-2,806 (-2.1)	-305 (-0.2)	-886 (-0.7)	2,294 (1.7)
1985	Avg	-	1,298 (1.1)	-227 (-0.2)	-251 (-0.2)	-216 (-0.2)	-383 (-0.3)	-196 (-0.2)	1,504 (1.3)
1986	Wet	-	15 (0.0)	1,529 (1.7)	2,078 (2.4)	-900 (-1.0)	1,403 (1.6)	2,841 (3.2)	3,650 (4.1)
1987	Avg	-	-469 (-0.5)	211 (0.2)	166 (0.2)	-1,117 (-1.1)	212 (0.2)	142 (0.1)	347 (0.3)
1988	Dry	-	-180 (-0.3)	-354 (-0.6)	-354 (-0.6)	-168 (-0.3)	-353 (-0.6)	-349 (-0.6)	-167 (-0.3)
1989	Dry	-	-140 (-0.2)	-113 (-0.2)	-114 (-0.2)	-157 (-0.3)	-114 (-0.2)	-113 (-0.2)	-93 (-0.2)
1990	Dry	-	-169 (-0.3)	-501 (-0.9)	-549 (-1.0)	-320 (-0.6)	-500 (-0.9)	-362 (-0.6)	-290 (-0.5)
1991	Avg	-	-84 (-0.1)	-65 (-0.1)	-106 (-0.2)	-81 (-0.1)	-87 (-0.1)	-67 (-0.1)	-54 (-0.1)
1992	Avg	-	-36 (-0.1)	-35 (-0.1)	-33 (-0.1)	-46 (-0.1)	-26 (0.0)	-26 (0.0)	-31 (-0.1)
1993	Wet	-	-63 (-0.1)	-61 (-0.1)	-62 (-0.1)	-485 (-0.5)	-61 (-0.1)	-47 (0.0)	-137 (-0.1)
1994	Avg	-	-19 (0.0)	-2 (0.0)	-4 (0.0)	-39 (-0.1)	-5 (0.0)	-6 (0.0)	-8 (0.0)
1995	Wet	-	-4,342 (-3.4)	-3,588 (-2.8)	-1,938 (-1.5)	-2,706 (-2.1)	-2,850 (-2.2)	-1,918 (-1.5)	53 (0.0)
1996	Wet	-	3,792 (3.9)	2,322 (2.4)	2,263 (2.3)	2,180 (2.2)	2,553 (2.6)	2,162 (2.2)	2,538 (2.6)
1997	Wet	-	-14 (0.0)	-206 (-0.2)	-63 (-0.1)	-18 (0.0)	-215 (-0.2)	-258 (-0.3)	-81 (-0.1)
1998	Avg	-	-101 (-0.1)	0 (0.0)	0 (0.0)	-2 (0.0)	0 (0.0)	0 (0.0)	-41 (-0.1)
1999	Avg	-	499 (0.5)	1,717 (1.7)	742 (0.7)	-623 (-0.6)	1,927 (1.9)	2,373 (2.4)	3,242 (3.2)
2000	Dry	-	-86 (-0.1)	-169 (-0.2)	-150 (-0.2)	-54 (-0.1)	-155 (-0.2)	-167 (-0.2)	-141 (-0.2)
2001	Avg	-	4 (0.0)	-41 (-0.1)	-27 (0.0)	-13 (0.0)	-27 (0.0)	-15 (0.0)	-27 (0.0)
2002	Dry	-	-13 (0.0)	-172 (-0.4)	-176 (-0.4)	-82 (-0.2)	-216 (-0.5)	-120 (-0.3)	-77 (-0.2)
2003	Avg	-	-1,207 (-1.8)	-1,109 (-1.6)	-1,205 (-1.8)	-1,133 (-1.7)	-1,123 (-1.6)	-1,193 (-1.8)	-1,025 (-1.5)
2004	Dry	-	-291 (-0.5)	-158 (-0.3)	-158 (-0.3)	-292 (-0.5)	-158 (-0.3)	-158 (-0.3)	-156 (-0.3)
2005	Avg	-	-9 (0.0)	3 (0.0)	3 (0.0)	-9 (0.0)	3 (0.0)	-10 (0.0)	3 (0.0)
2006	Avg	-	-33 (0.0)	-36 (0.0)	-38 (0.0)	-33 (0.0)	-38 (0.0)	-34 (0.0)	-28 (0.0)
2007	Dry	-	-8 (0.0)	-7 (0.0)	-7 (0.0)	-9 (0.0)	-7 (0.0)	-5 (0.0)	-7 (0.0)
2008	Wet	-	160 (0.2)	144 (0.1)	137 (0.1)	160 (0.2)	139 (0.1)	108 (0.1)	98 (0.1)
2009	Avg	-	121 (0.2)	145 (0.2)	144 (0.2)	132 (0.2)	146 (0.2)	138 (0.2)	124 (0.2)
Average		-	-15 (0.0)	-2 (0.0)	-7 (0.0)	-337 (-0.4)	-17 (0.0)	53 (0.1)	398 (0.5)

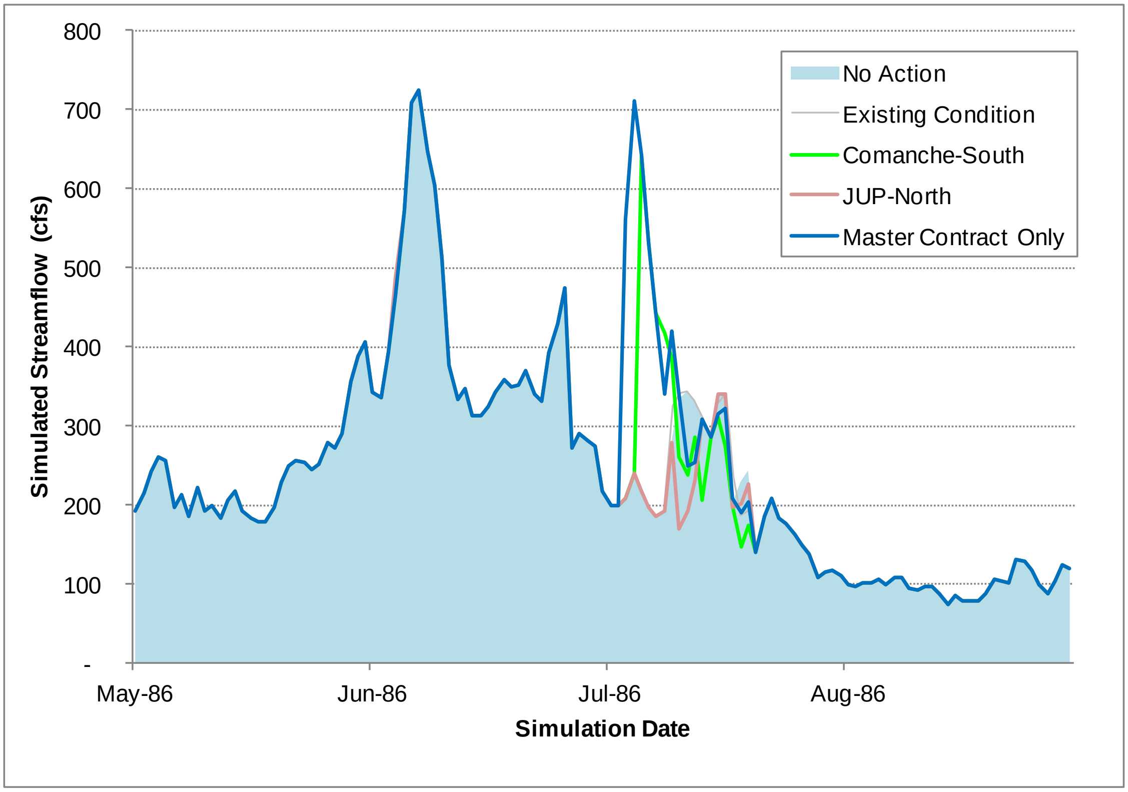


Figure 2. **Simulated Daily Streamflow (1986 Runoff Season) - Fryingpan River at Thomasville (Direct Effects)**

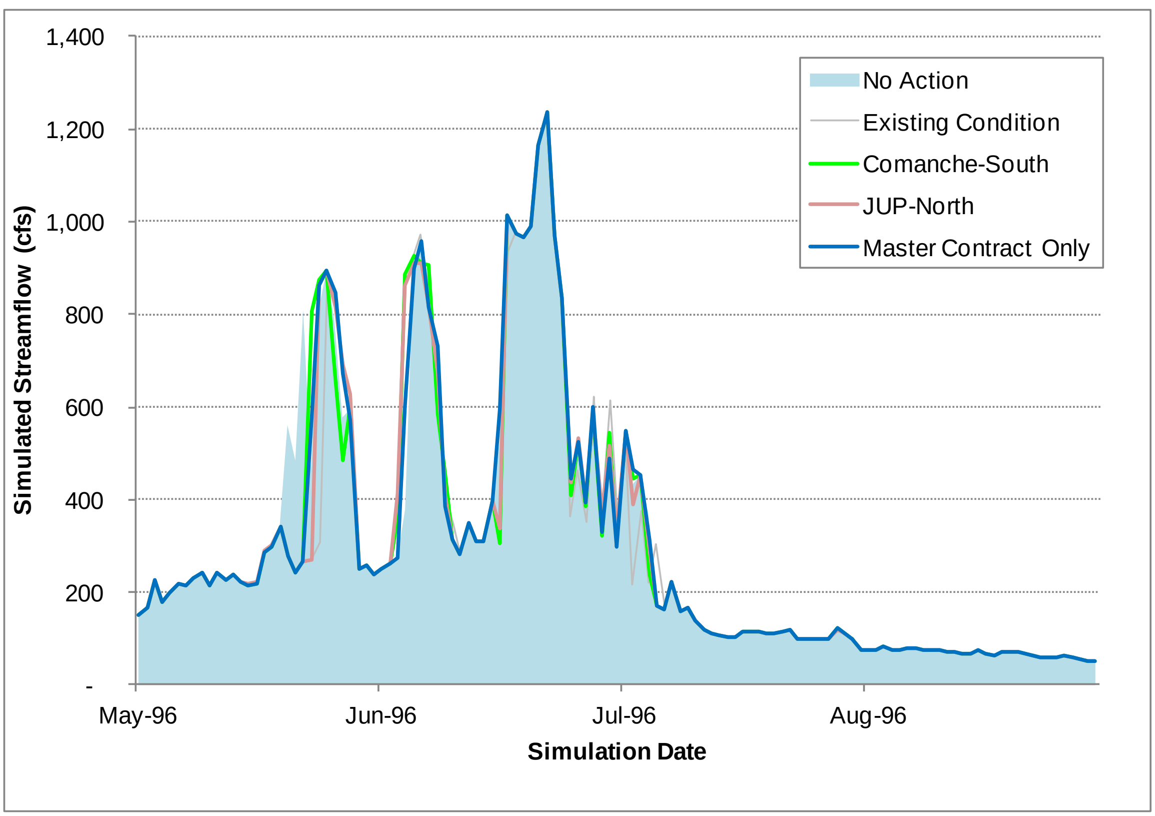


Figure 3. **Simulated Daily Streamflow (1996 Runoff Season) - Fryingpan River at Thomasville (Direct Effects)**

Mean monthly cumulative effects are negligible for all months and alternatives, except during June of the Master Contract Only Alternative, which shows a minor increase in streamflow (Table 8). Mean monthly cumulative effects streamflow is less than mean monthly direct effects streamflow due to increased Fry-Ark diversions of Fry-Ark water during most years by non-AVC Fry-Ark municipal entities.

Cumulative effects during typical normal, wet and dry-years are negligible (Table 9, Table 10 and Table 11, respectively). During normal and wet years, all cumulative effects are less than 0.5 cfs (which round to 0.0 cfs). Dry-year cumulative effects range from a 1 cfs decrease to a 2 cfs increase in streamflow.

All years show negligible effects on average annual streamflow except 1995 and 1996 which show minor effects on streamflow (Table 12). Both of these years were wet years on the East Slope when East Slope storage fills. In 1995, there is a minor decrease in streamflow during late July and August for the Joint Use Pipeline North Alternative (Figure 4), and in 1996, there is a minor increase in streamflow primarily during late June and early July for all alternatives except for the Joint Use Pipeline North Alternative (Figure 5). These differences are due to differences in timing of Fry-Ark diversions to the East Slope.

All alternatives including the No Action Alternative show decreases in streamflow from existing conditions due to increased diversions to the East Slope through the Busk-Ivanhoe Tunnel (during dry and normal years) and by the Fry-Ark Project (during wet years and normal years immediately following wet years). Increased transmountain diversions are used to supply increased municipal water demands on the East Slope under the cumulative effects scenario.

Table 8. Mean Monthly Streamflow Overall Average– Fryingpan River at Thomasville (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	26	26	26	26	26	26	26	26
Feb	25	25	25	25	25	25	25	25
Mar	33	33	33	33	33	33	33	33
Apr	96	96	96	96	96	96	96	96
May	292	277	277	277	277	277	277	277
Jun	412	351	354	354	352	354	354	363
Jul	197	171	170	170	169	170	169	171
Aug	89	86	88	86	85	87	87	87
Sep	62	62	62	62	62	62	62	62
Oct	55	55	55	55	55	55	55	55
Nov	39	39	39	39	39	39	39	39
Dec	31	31	31	31	31	31	31	31
Average	113	105	105	105	104	105	105	106
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Jun	-	-	2 (0.7)	2 (0.7)	0 (0.1)	2 (0.7)	3 (0.9)	11 (3.2)
Jul	-	-	-1 (-0.5)	-1 (-0.7)	-2 (-1.2)	-1 (-0.3)	-1 (-0.8)	0 (0.1)
Aug	-	-	1 (1.4)	0 (0.2)	-1 (-1.6)	1 (1.2)	1 (1.2)	1 (0.7)
Sep	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.2)	0 (0.1)	0 (-0.3)	0 (0.2)	0 (0.3)	1 (1.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-15 (-5.0)	-14 (-4.9)	-14 (-4.9)	-14 (-5.0)	-14 (-4.9)	-14 (-4.9)	-14 (-4.9)
Jun	-	-61 (-14.7)	-58 (-14.1)	-58 (-14.2)	-61 (-14.7)	-58 (-14.2)	-58 (-14.0)	-50 (-12.0)
Jul	-	-26 (-13.2)	-27 (-13.7)	-27 (-13.8)	-28 (-14.3)	-27 (-13.5)	-27 (-13.9)	-26 (-13.1)
Aug	-	-2 (-2.6)	-1 (-1.3)	-2 (-2.5)	-4 (-4.2)	-1 (-1.5)	-1 (-1.5)	-2 (-2.0)
Sep	-	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)
Oct	-	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.3)	0 (0.2)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Average	-	-9 (-7.6)	-8 (-7.4)	-9 (-7.5)	-9 (-7.9)	-8 (-7.4)	-8 (-7.4)	-8 (-6.7)

Table 9. Monthly Streamflow Normal Year (2005) – Fryingpan River at Thomasville (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	22	22	22	22	22	22	22	22
Feb	22	22	22	22	22	22	22	22
Mar	24	24	24	24	24	24	24	24
Apr	87	87	87	87	87	87	87	87
May	267	267	267	267	267	267	268	267
Jun	261	261	261	261	261	261	261	261
Jul	133	133	133	133	133	133	133	133
Aug	84	84	84	84	84	84	84	84
Sep	46	46	46	46	46	46	46	46
Oct	71	72	72	72	72	72	72	72
Nov	54	54	54	54	54	54	54	54
Dec	38	38	38	38	38	38	38	38
Average	93	93	93	93	93	93	93	93
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)
May	-	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.2)	0 (0.1)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	2 (2.3)	2 (2.3)	2 (2.3)	2 (2.3)	2 (2.3)	2 (2.4)	2 (2.3)
Nov	-	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)

Table 10. Monthly Streamflow Wet Year (1997) – Fryingpan River at Thomasville (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	35	35	35	35	35	35	35	35
Feb	31	31	31	31	31	31	31	31
Mar	54	54	54	54	54	54	54	54
Apr	90	90	90	90	90	90	90	90
May	281	275	275	275	275	275	275	275
Jun	561	509	509	509	509	509	509	509
Jul	171	166	166	166	166	166	166	166
Aug	95	94	94	94	94	94	94	94
Sep	82	83	83	83	83	83	83	83
Oct	77	77	77	77	77	77	77	77
Nov	49	49	49	49	49	49	49	49
Dec	37	37	37	37	37	37	37	37
Average	130	125	125	125	125	125	125	125
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.1)	0 (0.2)	0 (0.2)	0 (0.1)	0 (0.2)	0 (0.3)
Feb	-	-	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.2)	0 (0.2)	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.2)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	-1 (-1.5)	0 (-1.4)	0 (-1.3)	0 (-1.3)	0 (-1.4)	0 (-1.3)	0 (-1.2)
Feb	-	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (-0.3)	0 (-0.1)	0 (-0.1)	0 (-0.3)	0 (-0.1)	0 (-0.1)	0 (-0.1)
May	-	-6 (-2.1)	-6 (-2.1)	-6 (-2.1)	-6 (-2.1)	-6 (-2.1)	-6 (-2.1)	-6 (-2.1)
Jun	-	-53 (-9.4)	-53 (-9.4)	-53 (-9.4)	-53 (-9.4)	-53 (-9.4)	-53 (-9.4)	-53 (-9.4)
Jul	-	-5 (-2.9)	-5 (-2.9)	-5 (-2.9)	-5 (-2.9)	-5 (-2.9)	-5 (-2.9)	-5 (-2.9)
Aug	-	-1 (-1.5)	-1 (-1.5)	-1 (-1.5)	-1 (-1.5)	-1 (-1.5)	-1 (-1.5)	-1 (-1.5)
Sep	-	0 (0.3)	0 (0.3)	0 (0.3)	0 (0.3)	0 (0.3)	0 (0.3)	0 (0.3)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-5 (-4.1)	-5 (-4.1)	-5 (-4.1)	-5 (-4.1)	-5 (-4.1)	-5 (-4.1)	-5 (-4.1)

Table 11. Monthly Streamflow Dry Year (2004) – Fryingpan River at Thomasville (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	21	21	21	21	21	21	21	21
Feb	20	20	20	20	20	20	20	20
Mar	43	43	43	43	43	43	43	43
Apr	96	97	96	96	96	96	97	96
May	198	202	203	204	202	204	204	203
Jun	259	257	257	257	257	257	259	257
Jul	123	123	123	123	123	123	123	123
Aug	50	50	50	50	50	50	50	50
Sep	35	35	35	35	35	35	35	35
Oct	37	37	37	37	37	37	37	37
Nov	29	29	29	29	29	29	29	29
Dec	24	24	24	24	24	24	24	24
Average	78	78	78	78	78	78	79	78
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.2)	0 (0.3)	0 (-0.1)	0 (0.2)	0 (0.3)	0 (0.1)
Apr	-	-	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (0.0)	0 (-0.1)
May	-	-	1 (0.7)	2 (0.9)	1 (0.3)	2 (0.8)	2 (1.2)	1 (0.6)
Jun	-	-	-1 (-0.2)	-1 (-0.2)	0 (0.0)	-1 (-0.2)	1 (0.5)	-1 (-0.2)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.4)	0 (0.5)	0 (0.0)	0 (0.5)	0 (0.6)	0 (0.8)
Nov	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.1)	0 (0.2)	0 (0.0)	0 (0.2)	0 (0.4)	0 (0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.2)	0 (0.2)	0 (-0.1)	0 (0.2)	0 (0.2)	0 (0.1)
Apr	-	0 (0.2)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.1)	0 (0.2)	0 (0.1)
May	-	4 (2.0)	5 (2.7)	6 (2.9)	4 (2.3)	6 (2.9)	6 (3.2)	5 (2.7)
Jun	-	-1 (-0.5)	-2 (-0.7)	-2 (-0.7)	-1 (-0.5)	-2 (-0.7)	0 (0.0)	-2 (-0.7)
Jul	-	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)	0 (-0.2)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (-0.1)	0 (0.3)	0 (0.4)	0 (-0.1)	0 (0.4)	0 (0.5)	0 (0.7)
Nov	-	0 (0.0)	0 (0.1)	0 (0.1)	0 (-0.1)	0 (0.1)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.3)	0 (0.4)	0 (0.4)	0 (0.3)	0 (0.4)	1 (0.7)	0 (0.4)

Table 12. Simulated Annual Streamflow – Fryingpan River at Thomasville (Cumulative Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	76,828	72,888	72,883	72,895	72,891	72,880	72,890	72,861
1983	Avg	99,961	94,484	94,484	94,488	94,602	94,488	94,492	94,484
1984	Wet	135,537	126,059	126,025	126,034	126,059	126,025	126,025	126,098
1985	Avg	113,568	80,890	80,933	80,708	80,711	80,626	80,763	80,780
1986	Wet	88,191	83,271	82,917	82,968	83,981	83,081	83,349	81,981
1987	Avg	101,801	59,364	58,131	58,300	58,882	58,303	58,339	71,740
1988	Dry	60,815	58,162	58,162	58,162	58,162	58,162	58,198	58,526
1989	Dry	56,588	56,316	56,424	56,452	56,327	56,423	56,373	56,385
1990	Dry	56,589	53,562	53,561	53,562	53,561	53,561	53,559	53,558
1991	Avg	66,083	65,443	65,444	65,430	65,433	65,443	65,443	65,431
1992	Avg	60,559	60,120	60,119	60,124	60,120	60,119	60,118	60,118
1993	Wet	97,054	93,027	93,038	93,042	93,027	93,038	93,032	93,038
1994	Avg	63,226	60,768	60,781	60,781	60,768	60,781	60,783	60,784
1995	Wet	128,677	114,064	116,019	112,871	109,099	115,739	114,377	115,550
1996	Wet	97,548	72,881	77,248	77,700	72,623	77,360	78,100	79,797
1997	Wet	93,918	89,925	89,934	89,937	89,881	89,935	89,938	89,938
1998	Avg	76,997	72,776	72,821	72,833	72,797	72,833	72,824	72,804
1999	Avg	100,263	95,463	95,513	95,513	95,433	95,519	95,507	95,528
2000	Dry	91,740	87,425	87,749	87,752	87,413	87,730	87,756	87,706
2001	Avg	67,996	65,246	65,254	65,254	65,249	65,250	65,250	65,251
2002	Dry	46,018	46,487	46,335	46,285	46,267	46,331	46,502	46,480
2003	Avg	68,096	66,836	66,800	66,800	66,792	66,801	66,771	66,812
2004	Dry	56,521	56,663	56,715	56,742	56,691	56,736	56,898	56,707
2005	Avg	62,741	62,767	62,778	62,780	62,766	62,780	62,790	62,786
2006	Avg	82,553	82,859	82,784	82,779	82,797	82,777	82,861	82,817
2007	Dry	70,353	70,667	70,752	70,747	70,665	70,751	70,755	70,750
2008	Wet	99,099	97,064	97,115	97,111	97,053	97,111	97,098	97,089
2009	Avg	77,077	75,766	75,761	75,761	75,766	75,759	75,769	75,764
Average		82,014	75,759	75,946	75,850	75,565	75,941	75,948	76,484
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	-5 (0.0)	7 (0.0)	4 (0.0)	-8 (0.0)	2 (0.0)	-27 (0.0)
1983	Avg	-	-	0 (0.0)	4 (0.0)	118 (0.1)	4 (0.0)	8 (0.0)	0 (0.0)
1984	Wet	-	-	-34 (0.0)	-25 (0.0)	0 (0.0)	-34 (0.0)	-34 (0.0)	39 (0.0)
1985	Avg	-	-	42 (0.1)	-182 (-0.2)	-180 (-0.2)	-265 (-0.3)	-128 (-0.2)	-110 (-0.1)
1986	Wet	-	-	-355 (-0.4)	-303 (-0.4)	710 (0.9)	-190 (-0.2)	78 (0.1)	-1,290 (-1.5)
1987	Avg	-	-	-1,234 (-2.1)	-1,064 (-1.8)	-482 (-0.8)	-1,061 (-1.8)	-1,026 (-1.7)	12,376 (20.8)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	36 (0.1)	365 (0.6)
1989	Dry	-	-	108 (0.2)	136 (0.2)	12 (0.0)	108 (0.2)	57 (0.1)	69 (0.1)
1990	Dry	-	-	-1 (0.0)	0 (0.0)	-1 (0.0)	-1 (0.0)	-2 (0.0)	-3 (0.0)
1991	Avg	-	-	0 (0.0)	-13 (0.0)	-10 (0.0)	0 (0.0)	-1 (0.0)	-12 (0.0)
1992	Avg	-	-	-2 (0.0)	4 (0.0)	0 (0.0)	-2 (0.0)	-3 (0.0)	-2 (0.0)
1993	Wet	-	-	11 (0.0)	15 (0.0)	0 (0.0)	11 (0.0)	5 (0.0)	10 (0.0)
1994	Avg	-	-	13 (0.0)	13 (0.0)	-1 (0.0)	13 (0.0)	14 (0.0)	15 (0.0)
1995	Wet	-	-	1,955 (1.7)	-1,193 (-1.0)	-4,965 (-4.4)	1,675 (1.5)	313 (0.3)	1,486 (1.3)
1996	Wet	-	-	4,367 (6.0)	4,819 (6.6)	-258 (-0.4)	4,478 (6.1)	5,219 (7.2)	6,916 (9.5)
1997	Wet	-	-	9 (0.0)	12 (0.0)	-44 (0.0)	11 (0.0)	13 (0.0)	13 (0.0)
1998	Avg	-	-	44 (0.1)	57 (0.1)	20 (0.0)	57 (0.1)	48 (0.1)	28 (0.0)
1999	Avg	-	-	49 (0.1)	49 (0.1)	-30 (0.0)	56 (0.1)	44 (0.0)	64 (0.1)
2000	Dry	-	-	323 (0.4)	327 (0.4)	-12 (0.0)	305 (0.3)	330 (0.4)	281 (0.3)
2001	Avg	-	-	8 (0.0)	8 (0.0)	3 (0.0)	5 (0.0)	4 (0.0)	5 (0.0)
2002	Dry	-	-	-152 (-0.3)	-203 (-0.4)	-220 (-0.5)	-157 (-0.3)	15 (0.0)	-7 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2003	Avg	-	-	-35 (-0.1)	-35 (-0.1)	-44 (-0.1)	-35 (-0.1)	-65 (-0.1)	-24 (0.0)
2004	Dry	-	-	51 (0.1)	78 (0.1)	28 (0.0)	73 (0.1)	235 (0.4)	44 (0.1)
2005	Avg	-	-	11 (0.0)	13 (0.0)	-1 (0.0)	14 (0.0)	23 (0.0)	19 (0.0)
2006	Avg	-	-	-74 (-0.1)	-80 (-0.1)	-62 (-0.1)	-82 (-0.1)	2 (0.0)	-41 (0.0)
2007	Dry	-	-	85 (0.1)	80 (0.1)	-2 (0.0)	84 (0.1)	88 (0.1)	83 (0.1)
2008	Wet	-	-	51 (0.1)	47 (0.0)	-11 (0.0)	47 (0.0)	34 (0.0)	25 (0.0)
2009	Avg	-	-	-5 (0.0)	-5 (0.0)	0 (0.0)	-7 (0.0)	3 (0.0)	-1 (0.0)
Average		-	-	187 (0.2)	92 (0.1)	-194 (-0.3)	182 (0.2)	190 (0.3)	726 (1.0)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	-3,940 (-5.1)	-3,945 (-5.1)	-3,933 (-5.1)	-3,936 (-5.1)	-3,948 (-5.1)	-3,938 (-5.1)	-3,967 (-5.2)
1983	Avg	-	-5,478 (-5.5)	-5,478 (-5.5)	-5,474 (-5.5)	-5,359 (-5.4)	-5,474 (-5.5)	-5,469 (-5.5)	-5,478 (-5.5)
1984	Wet	-	-9,477 (-7.0)	-9,512 (-7.0)	-9,502 (-7.0)	-9,477 (-7.0)	-9,512 (-7.0)	-9,512 (-7.0)	-9,438 (-7.0)
1985	Avg	-	-32,678 (-28.8)	-32,636 (-28.7)	-32,860 (-28.9)	-32,858 (-28.9)	-32,943 (-29.0)	-32,806 (-28.9)	-32,788 (-28.9)
1986	Wet	-	-4,919 (-5.6)	-5,274 (-6.0)	-5,222 (-5.9)	-4,210 (-4.8)	-5,110 (-5.8)	-4,842 (-5.5)	-6,209 (-7.0)
1987	Avg	-	-42,437 (-41.7)	-43,670 (-42.9)	-43,500 (-42.7)	-42,919 (-42.2)	-43,498 (-42.7)	-43,462 (-42.7)	-30,061 (-29.5)
1988	Dry	-	-2,653 (-4.4)	-2,653 (-4.4)	-2,653 (-4.4)	-2,653 (-4.4)	-2,653 (-4.4)	-2,618 (-4.3)	-2,289 (-3.8)
1989	Dry	-	-273 (-0.5)	-165 (-0.3)	-137 (-0.2)	-261 (-0.5)	-165 (-0.3)	-216 (-0.4)	-204 (-0.4)
1990	Dry	-	-3,028 (-5.4)	-3,029 (-5.4)	-3,028 (-5.4)	-3,029 (-5.4)	-3,029 (-5.4)	-3,030 (-5.4)	-3,031 (-5.4)
1991	Avg	-	-640 (-1.0)	-639 (-1.0)	-653 (-1.0)	-649 (-1.0)	-640 (-1.0)	-640 (-1.0)	-652 (-1.0)
1992	Avg	-	-438 (-0.7)	-440 (-0.7)	-435 (-0.7)	-439 (-0.7)	-440 (-0.7)	-441 (-0.7)	-441 (-0.7)
1993	Wet	-	-4,027 (-4.1)	-4,016 (-4.1)	-4,012 (-4.1)	-4,027 (-4.1)	-4,017 (-4.1)	-4,022 (-4.1)	-4,017 (-4.1)
1994	Avg	-	-2,458 (-3.9)	-2,445 (-3.9)	-2,445 (-3.9)	-2,458 (-3.9)	-2,445 (-3.9)	-2,443 (-3.9)	-2,442 (-3.9)
1995	Wet	-	-14,613 (-11.4)	-12,658 (-9.8)	-15,806 (-12.3)	-19,578 (-15.2)	-12,938 (-10.1)	-14,300 (-11.1)	-13,127 (-10.2)
1996	Wet	-	-24,667 (-25.3)	-20,300 (-20.8)	-19,848 (-20.3)	-24,925 (-25.6)	-20,189 (-20.7)	-19,448 (-19.9)	-17,751 (-18.2)
1997	Wet	-	-3,993 (-4.3)	-3,984 (-4.2)	-3,981 (-4.2)	-4,037 (-4.3)	-3,983 (-4.2)	-3,980 (-4.2)	-3,980 (-4.2)
1998	Avg	-	-4,221 (-5.5)	-4,177 (-5.4)	-4,164 (-5.4)	-4,201 (-5.5)	-4,164 (-5.4)	-4,173 (-5.4)	-4,194 (-5.4)
1999	Avg	-	-4,799 (-4.8)	-4,750 (-4.7)	-4,750 (-4.7)	-4,830 (-4.8)	-4,744 (-4.7)	-4,756 (-4.7)	-4,735 (-4.7)
2000	Dry	-	-4,315 (-4.7)	-3,992 (-4.4)	-3,988 (-4.3)	-4,328 (-4.7)	-4,011 (-4.4)	-3,985 (-4.3)	-4,034 (-4.4)
2001	Avg	-	-2,750 (-4.0)	-2,742 (-4.0)	-2,742 (-4.0)	-2,747 (-4.0)	-2,745 (-4.0)	-2,745 (-4.0)	-2,745 (-4.0)
2002	Dry	-	469 (1.0)	317 (0.7)	267 (0.6)	249 (0.5)	313 (0.7)	484 (1.1)	462 (1.0)
2003	Avg	-	-1,260 (-1.9)	-1,295 (-1.9)	-1,295 (-1.9)	-1,304 (-1.9)	-1,295 (-1.9)	-1,325 (-1.9)	-1,284 (-1.9)
2004	Dry	-	142 (0.3)	194 (0.3)	221 (0.4)	170 (0.3)	216 (0.4)	377 (0.7)	186 (0.3)
2005	Avg	-	26 (0.0)	36 (0.1)	38 (0.1)	25 (0.0)	39 (0.1)	48 (0.1)	44 (0.1)
2006	Avg	-	306 (0.4)	231 (0.3)	226 (0.3)	244 (0.3)	224 (0.3)	308 (0.4)	265 (0.3)
2007	Dry	-	314 (0.4)	399 (0.6)	394 (0.6)	312 (0.4)	397 (0.6)	402 (0.6)	397 (0.6)
2008	Wet	-	-2,034 (-2.1)	-1,983 (-2.0)	-1,987 (-2.0)	-2,045 (-2.1)	-1,987 (-2.0)	-2,001 (-2.0)	-2,009 (-2.0)
2009	Avg	-	-1,311 (-1.7)	-1,316 (-1.7)	-1,316 (-1.7)	-1,311 (-1.7)	-1,318 (-1.7)	-1,309 (-1.7)	-1,313 (-1.7)
Average		-	-6,255 (-7.6)	-6,069 (-7.4)	-6,164 (-7.5)	-6,449 (-7.9)	-6,074 (-7.4)	-6,066 (-7.4)	-5,530 (-6.7)

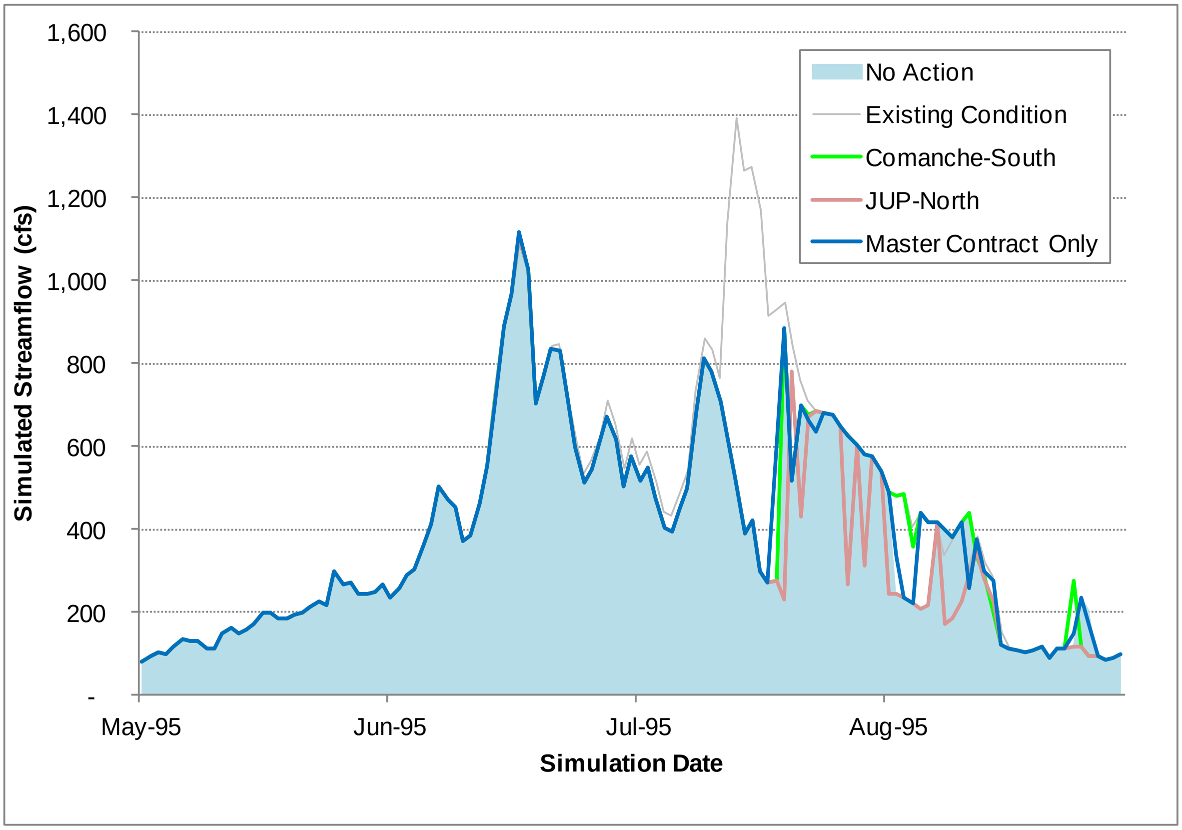


Figure 4. **Simulated Daily Streamflow (1995 Runoff Season) - Fryingpan River at Thomasville (Cumulative Effects)**

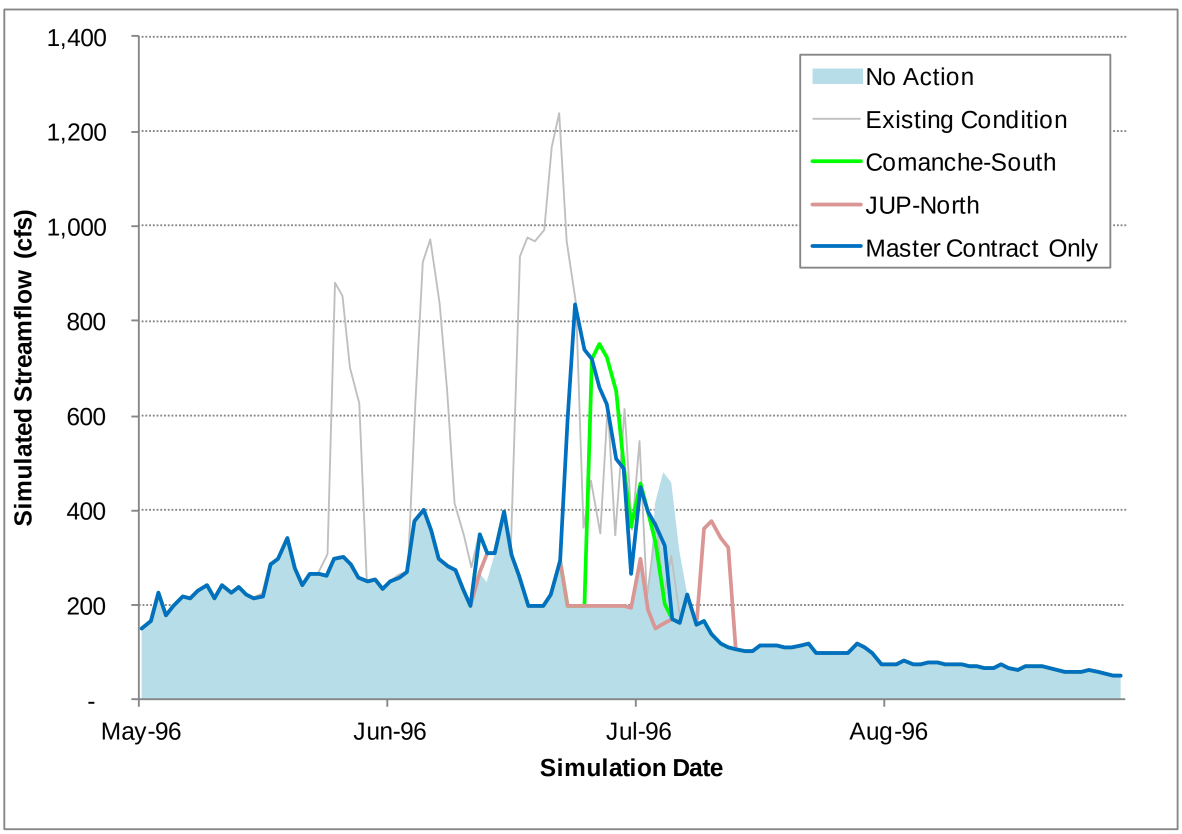


Figure 5. **Simulated Daily Streamflow (1996 Runoff Season) - Fryingpan River at Thomasville (Cumulative Effects)**

The Fryingpan River at Thomasville gage represents the downstream extent of West Slope hydrologic investigations. Downstream from the AVC EIS study area, the Fryingpan River is the primary inflow source to Ruedi Reservoir. Ruedi Dam and Reservoir is located on the Fryingpan River downstream from the Fry-Ark collection system. Ruedi Reservoir has a total capacity of 102,373 acre-feet and a water surface elevation of 7766.0 feet. The reservoir is operated on an annual cycle. The reservoir is filled with spring runoff, and releases to the Fryingpan River at rates below the safe channel capacity. The reservoir provides replacement water for out-of-priority depletions to the Colorado River by the project as well as for West Slope irrigation, municipal, and industrial uses on a contractual basis. The reservoir is also operated to provide for recreation, wildlife habitat and flood control (Reclamation 2010).

None of the changes in streamflow would be expected to translate into measureable effects in Ruedi Reservoir. The capacity of Ruedi Reservoir is 102,373 acre-feet, and fills during all years except extremely dry years (Figure 6; Grand River Consulting 2011). All alternatives show a negligible increase or negligible decrease in average annual changes in inflow to Ruedi Reservoir from the Fryingpan River. These differences primarily occur during wet years when Ruedi Reservoir typically fills. The increase in inflows to the reservoir during wetter years would result in increased releases from the reservoir. The result would likely be a slightly prolonged release from the reservoir during peak runoff conditions.

Increased diversions in the cumulative effects analysis (when compared with existing conditions) may slightly increase the years Ruedi Reservoir does not fill, though increases in diversions are most pronounced in wet and normal years when there is a higher likelihood of filling even with increased diversions.

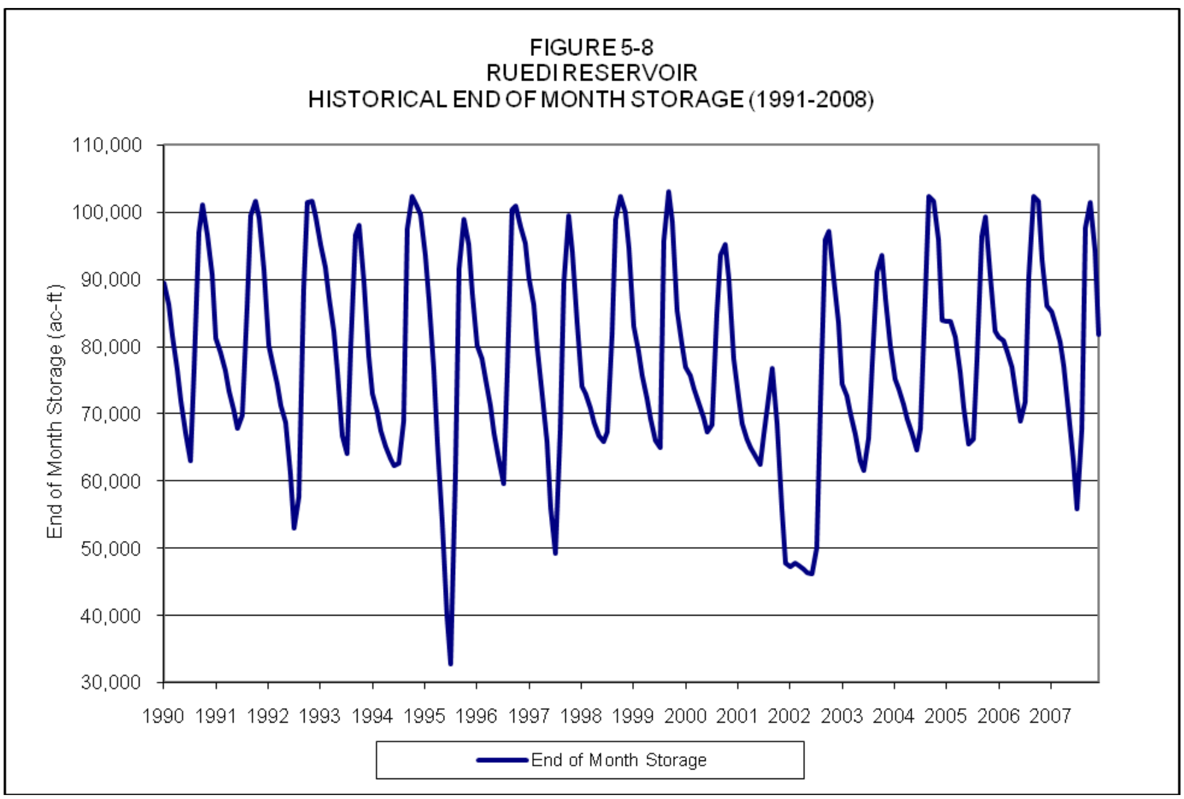


Figure 6. Ruedi Reservoir Historical End-of-Month Storage (Grand River Consulting 2011)

Roaring Fork River Basin

Streamflow in the Roaring Fork River Basin is influenced by diversions from the Fry-Ark collection system and the Twin Lakes Project. The Fry-Ark collection system influences streamflow in Hunter Creek and its tributaries, and the Roaring Fork downstream from the confluence. The Twin Lakes Project influences streamflow in the Roaring Fork River and several tributaries downstream from its diversion facilities. Streamflow effects were analyzed in Hunter Creek, and the Roaring Fork River upstream and downstream from Hunter Creek. Effects in the smaller tributaries of Hunter Creek would be similar to those at the Hunter Creek gage, while effects in the smaller tributaries of the Roaring Fork River would be similar to those for the Roaring Fork above Difficult Creek gage.

Hunter Creek near Aspen

Mean monthly direct effects for the Hunter Creek near Aspen gage are negligible (Table 13). There is no change in simulated streamflow during typically dry, normal and wet years (
Table 14,
Table 15, and
Table 16, respectively). Effects are less pronounced than the Fryingpan River because Fry-Ark diversions make up a smaller percentage of flow at the Hunter Creek gage than at the Fryingpan River at Thomasville gage, and because the Hunter Creek gage is not affected by diversions through the Busk-Ivanhoe Tunnel.

All annual effects are negligible (Table 17) except for the Master Contract Only Alternative which shows a minor increase in average annual streamflow in 1999, a wet year on the East Slope. Differences in streamflow primarily occur during mid to late June, during which the Master Contract Only Alternative would increase daily streamflow for about one week due to decreased Fry-Ark diversions (Figure 7).

Table 13. Mean Monthly Streamflow Overall Average– Hunter Creek near Aspen (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	6	6	6	6	6	6	6	6
Feb	6	6	6	6	6	6	6	6
Mar	7	7	7	7	7	7	7	7
Apr	22	22	22	22	22	22	22	22
May	124	124	124	124	124	124	124	124
Jun	182	183	183	182	182	183	183	183
Jul	75	74	75	75	74	75	75	75
Aug	31	31	31	31	31	31	31	31
Sep	18	18	18	18	18	18	18	18
Oct	17	17	17	17	17	17	17	17
Nov	11	11	11	11	11	11	11	11
Dec	7	7	7	7	7	7	7	7
Average	42	42	42	42	42	42	42	42
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.1)	0 (0.0)	0 (-0.1)	0 (0.1)	0 (0.1)	1 (0.3)
Jul	-	-	0 (0.1)	0 (0.2)	0 (-0.3)	0 (0.1)	0 (0.2)	0 (0.4)
Aug	-	-	0 (0.0)	0 (0.2)	0 (0.3)	0 (0.1)	0 (0.2)	0 (0.3)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.1)	0 (0.1)	0 (0.2)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.1)	0 (0.2)	0 (0.1)	0 (0.0)	0 (0.2)	1 (0.3)	1 (0.5)
Jul	-	0 (-0.1)	0 (0.0)	0 (0.0)	0 (-0.4)	0 (0.0)	0 (0.1)	0 (0.3)
Aug	-	0 (-0.3)	0 (-0.2)	0 (-0.1)	0 (0.0)	0 (-0.2)	0 (-0.1)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.1)	0 (0.0)	0 (-0.1)	0 (0.1)	0 (0.1)	0 (0.2)

Table 14. Monthly Streamflow Normal Year (2005) – Hunter Creek near Aspen (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	5	5	5	5	5	5	5	5
Apr	17	17	17	17	17	17	17	17
May	83	83	83	83	83	83	83	83
Jun	102	102	102	102	102	102	102	102
Jul	44	44	44	44	44	44	44	44
Aug	24	24	24	24	24	24	24	24
Sep	11	11	11	11	11	11	11	11
Oct	20	20	20	20	20	20	20	20
Nov	15	15	15	15	15	15	15	15
Dec	11	11	11	11	11	11	11	11
Average	28	28	28	28	28	28	28	28
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 15. Monthly Streamflow Wet Year (1997) – Hunter Creek near Aspen (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	6	6	6	6	6	6	6	6
Mar	11	11	11	11	11	11	11	11
Apr	19	19	19	19	19	19	19	19
May	79	79	79	79	79	79	79	79
Jun	204	204	204	204	204	204	204	204
Jul	56	56	56	56	56	56	56	56
Aug	41	41	41	41	41	41	41	41
Sep	26	26	26	26	26	26	26	26
Oct	23	23	23	23	23	23	23	23
Nov	12	12	12	12	12	12	12	12
Dec	8	8	8	8	8	8	8	8
Average	41	41	41	41	41	41	41	41
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 16. Monthly Streamflow Dry Year (2004) – Hunter Creek near Aspen (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	3	3	3	3	3	3	3	3
Feb	3	3	3	3	3	3	3	3
Mar	9	9	9	9	9	9	9	9
Apr	22	22	22	22	22	22	22	22
May	68	68	68	68	68	68	68	68
Jun	85	85	85	85	85	85	85	85
Jul	31	31	31	31	31	31	31	31
Aug	8	8	8	8	8	8	8	8
Sep	6	6	6	6	6	6	6	6
Oct	8	8	8	8	8	8	8	8
Nov	6	6	6	6	6	6	6	6
Dec	4	4	4	4	4	4	4	4
Average	21	21	21	21	21	21	21	21
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 17. Simulated Annual Streamflow – Hunter Creek near Aspen (Direct Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	24,542	24,542	24,542	24,542	24,542	24,542	24,542	24,542
1983	Avg	42,154	42,154	42,154	42,154	42,154	42,154	42,154	42,154
1984	Wet	50,604	50,625	50,623	50,609	50,576	50,600	50,593	50,628
1985	Avg	42,587	42,747	42,544	42,540	42,545	42,515	42,550	42,788
1986	Wet	34,290	34,293	34,428	34,476	34,211	34,418	34,544	34,616
1987	Avg	39,224	39,218	39,230	39,236	39,219	39,236	39,236	39,231
1988	Dry	28,166	28,166	28,166	28,166	28,166	28,166	28,166	28,166
1989	Dry	20,904	20,904	20,904	20,904	20,904	20,904	20,904	20,904
1990	Dry	20,927	20,927	20,927	20,927	20,927	20,927	20,927	20,927
1991	Avg	26,251	26,251	26,251	26,251	26,251	26,251	26,251	26,251
1992	Avg	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846
1993	Wet	38,998	38,998	38,998	38,998	38,998	38,998	38,998	38,998
1994	Avg	20,382	20,382	20,382	20,382	20,382	20,382	20,382	20,382
1995	Wet	44,621	44,297	44,351	44,430	44,227	44,386	44,444	44,605
1996	Wet	58,892	58,945	58,918	58,916	58,921	58,917	58,906	58,932
1997	Wet	29,753	29,753	29,753	29,753	29,753	29,753	29,753	29,753
1998	Avg	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250
1999	Avg	42,698	42,861	43,319	42,949	42,698	43,398	43,545	43,848
2000	Dry	27,595	27,595	27,595	27,595	27,595	27,595	27,595	27,595
2001	Avg	18,566	18,566	18,566	18,566	18,566	18,566	18,566	18,566
2002	Dry	11,220	11,220	11,220	11,220	11,220	11,220	11,220	11,220
2003	Avg	22,359	22,359	22,359	22,359	22,359	22,359	22,359	22,359
2004	Dry	15,264	15,264	15,264	15,264	15,264	15,264	15,264	15,264
2005	Avg	18,969	18,969	18,969	18,969	18,969	18,969	18,969	18,969
2006	Avg	32,090	32,090	32,090	32,090	32,090	32,090	32,090	32,090
2007	Dry	34,888	34,888	34,888	34,888	34,888	34,888	34,888	34,888
2008	Wet	35,743	35,743	35,743	35,743	35,743	35,743	35,743	35,743
2009	Avg	27,396	27,396	27,396	27,396	27,396	27,396	27,396	27,396
Average		30,614	30,616	30,631	30,622	30,595	30,633	30,646	30,675
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1984	Wet	-	-	-1 (0.0)	-16 (0.0)	-48 (-0.1)	-25 (0.0)	-32 (-0.1)	4 (0.0)
1985	Avg	-	-	-203 (-0.5)	-207 (-0.5)	-202 (-0.5)	-232 (-0.5)	-197 (-0.5)	41 (0.1)
1986	Wet	-	-	136 (0.4)	184 (0.5)	-82 (-0.2)	125 (0.4)	251 (0.7)	323 (0.9)
1987	Avg	-	-	12 (0.0)	18 (0.0)	1 (0.0)	18 (0.0)	18 (0.0)	13 (0.0)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-	54 (0.1)	132 (0.3)	-70 (-0.2)	89 (0.2)	147 (0.3)	308 (0.7)
1996	Wet	-	-	-27 (0.0)	-29 (0.0)	-25 (0.0)	-29 (0.0)	-39 (-0.1)	-14 (0.0)
1997	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	457 (1.1)	88 (0.2)	-163 (-0.4)	536 (1.3)	683 (1.6)	986 (2.3)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	*Dry*	-	-	*0 (0.0)*	*0 (0.0)*	*0 (0.0)*	*0 (0.0)*	*0 (0.0)*	*0 (0.0)*
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-	15 (0.0)	6 (0.0)	-21 (-0.1)	17 (0.1)	30 (0.1)	59 (0.2)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1984	Wet	-	20 (0.0)	19 (0.0)	5 (0.0)	-28 (-0.1)	-4 (0.0)	-12 (0.0)	24 (0.0)
1985	Avg	-	160 (0.4)	-43 (-0.1)	-47 (-0.1)	-42 (-0.1)	-72 (-0.2)	-37 (-0.1)	201 (0.5)
1986	Wet	-	3 (0.0)	139 (0.4)	186 (0.5)	-79 (-0.2)	128 (0.4)	254 (0.7)	326 (1.0)
1987	Avg	-	-7 (0.0)	5 (0.0)	11 (0.0)	-5 (0.0)	11 (0.0)	11 (0.0)	7 (0.0)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-324 (-0.7)	-270 (-0.6)	-192 (-0.4)	-394 (-0.9)	-235 (-0.5)	-177 (-0.4)	-16 (0.0)
1996	Wet	-	53 (0.1)	26 (0.0)	24 (0.0)	29 (0.0)	25 (0.0)	14 (0.0)	40 (0.1)
1997	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	163 (0.4)	621 (1.5)	251 (0.6)	0 (0.0)	699 (1.6)	846 (2.0)	1,149 (2.7)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	2 (0.0)	18 (0.1)	9 (0.0)	-19 (-0.1)	20 (0.1)	32 (0.1)	62 (0.2)

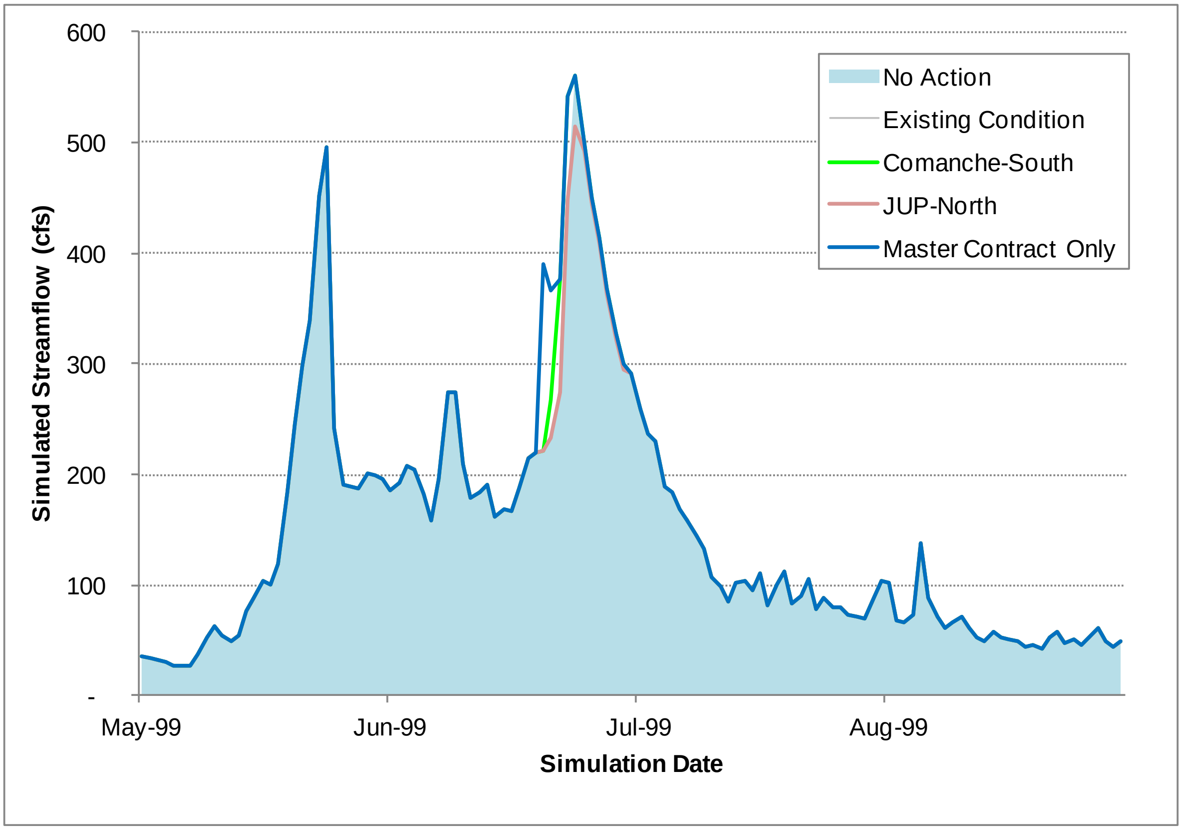


Figure 7. Simulated Daily Streamflow (1999 Runoff Season) - Hunter Creek near Aspen (Direct Effects)

Mean monthly cumulative effects for the Hunter Creek near Aspen gage are negligible for all alternatives (Table 18). There are no cumulative streamflow effects during typical normal, wet and dry and wet years (
Table 19,
Table 20 and
Table 21, respectively).

All annual cumulative effects are negligible (Table 22). Only 4 of 28 years show any difference in streamflow between the action alternatives and the No Action Alternative, while 5 of 28 years show differences between the alternatives and existing conditions. Cumulative effects streamflow for 1985 and 2005, two years that show greater cumulative effects and differences from existing conditions, are shown in Figure 8 and Figure 9, respectively. In 1995, streamflow for all alternatives including the No Action Alternative are identical. Streamflow is less than Existing Condition streamflow from mid-June through July due to increased Fry-Ark diversions. In 1995, all alternatives result in lower streamflow in mid-July. The Joint Use Pipeline North Alternative shows lower streamflow than other alternatives from mid-July through mid-August.

Table 18. Mean Monthly Streamflow Overall Average– Hunter Creek near Aspen (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	6	6	6	6	6	6	6	6
Feb	6	6	6	6	6	6	6	6
Mar	7	7	7	7	7	7	7	7
Apr	22	22	22	22	22	22	22	22
May	124	124	124	124	124	124	124	124
Jun	182	180	180	180	180	180	180	180
Jul	75	73	73	72	72	73	72	73
Aug	31	31	31	31	31	31	31	31
Sep	18	18	18	18	18	18	18	18
Oct	17	17	17	17	17	17	17	17
Nov	11	11	11	11	11	11	11	11
Dec	7	7	7	7	7	7	7	7
Average	42	42	42	42	42	42	42	42
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.2)
Jul	-	-	0 (-0.2)	0 (-0.3)	0 (-0.5)	0 (-0.2)	0 (-0.3)	0 (0.1)
Aug	-	-	0 (0.2)	0 (0.0)	0 (-0.2)	0 (0.2)	0 (0.2)	0 (0.1)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-3 (-1.4)	-3 (-1.4)	-3 (-1.4)	-3 (-1.4)	-3 (-1.4)	-3 (-1.4)	-2 (-1.2)
Jul	-	-2 (-2.5)	-2 (-2.6)	-2 (-2.8)	-2 (-2.9)	-2 (-2.6)	-2 (-2.8)	-2 (-2.4)
Aug	-	0 (-0.2)	0 (0.0)	0 (-0.1)	0 (-0.4)	0 (0.0)	0 (0.0)	0 (-0.1)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (-0.9)	0 (-0.9)	0 (-0.9)	0 (-1.0)	0 (-0.9)	0 (-0.9)	0 (-0.8)

Table 19. Monthly Streamflow Normal Year (2005) – Hunter Creek near Aspen (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	4	4	4	4	4	4	4	4
Feb	4	4	4	4	4	4	4	4
Mar	5	5	5	5	5	5	5	5
Apr	17	17	17	17	17	17	17	17
May	83	83	83	83	83	83	83	83
Jun	102	102	102	102	102	102	102	102
Jul	44	44	44	44	44	44	44	44
Aug	24	24	24	24	24	24	24	24
Sep	11	11	11	11	11	11	11	11
Oct	20	20	20	20	20	20	20	20
Nov	15	15	15	15	15	15	15	15
Dec	11	11	11	11	11	11	11	11
Average	28	28	28	28	28	28	28	28
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 20. Monthly Streamflow Wet Year (1997) – Hunter Creek near Aspen (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	6	6	6	6	6	6	6	6
Mar	11	11	11	11	11	11	11	11
Apr	19	19	19	19	19	19	19	19
May	79	79	79	79	79	79	79	79
Jun	204	204	204	204	204	204	204	204
Jul	56	56	56	56	56	56	56	56
Aug	41	41	41	41	41	41	41	41
Sep	26	26	26	26	26	26	26	26
Oct	23	23	23	23	23	23	23	23
Nov	12	12	12	12	12	12	12	12
Dec	8	8	8	8	8	8	8	8
Average	41	41	41	41	41	41	41	41
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 21. Monthly Streamflow Dry Year (2004) – Hunter Creek near Aspen (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	3	3	3	3	3	3	3	3
Feb	3	3	3	3	3	3	3	3
Mar	9	9	9	9	9	9	9	9
Apr	22	22	22	22	22	22	22	22
May	68	68	68	68	68	68	68	68
Jun	85	85	85	85	85	85	85	85
Jul	31	31	31	31	31	31	31	31
Aug	8	8	8	8	8	8	8	8
Sep	6	6	6	6	6	6	6	6
Oct	8	8	8	8	8	8	8	8
Nov	6	6	6	6	6	6	6	6
Dec	4	4	4	4	4	4	4	4
Average	21	21	21	21	21	21	21	21
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 22. Simulated Annual Streamflow – Hunter Creek near Aspen (Cumulative Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	24,542	24,542	24,542	24,542	24,542	24,542	24,542	24,542
1983	Avg	42,154	42,154	42,154	42,154	42,154	42,154	42,154	42,154
1984	Wet	50,604	50,551	50,551	50,551	50,551	50,551	50,551	50,551
1985	Avg	42,587	38,061	38,061	38,061	38,061	38,061	38,061	38,061
1986	Wet	34,290	34,087	34,087	34,087	34,087	34,087	34,087	34,087
1987	Avg	39,224	38,042	37,849	37,849	37,849	37,849	37,849	38,751
1988	Dry	28,166	28,166	28,166	28,166	28,166	28,166	28,166	28,166
1989	Dry	20,904	20,904	20,904	20,904	20,904	20,904	20,904	20,904
1990	Dry	20,927	20,927	20,927	20,927	20,927	20,927	20,927	20,927
1991	Avg	26,251	26,251	26,251	26,251	26,251	26,251	26,251	26,251
1992	Avg	21,846	21,846	21,846	21,846	21,846	21,846	21,846	21,846
1993	Wet	38,998	38,998	38,998	38,998	38,998	38,998	38,998	38,998
1994	Avg	20,382	20,382	20,382	20,382	20,382	20,382	20,382	20,382
1995	Wet	44,621	42,979	43,071	42,782	42,476	43,058	42,856	43,121
1996	Wet	58,892	58,923	58,874	58,919	58,893	58,905	58,893	58,885
1997	Wet	29,753	29,753	29,753	29,753	29,753	29,753	29,753	29,753
1998	Avg	26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250
1999	Avg	42,698	42,698	42,698	42,698	42,698	42,698	42,698	42,698
2000	Dry	27,595	27,595	27,595	27,595	27,595	27,595	27,595	27,595
2001	Avg	18,566	18,566	18,566	18,566	18,566	18,566	18,566	18,566
2002	Dry	11,220	11,220	11,220	11,220	11,220	11,220	11,220	11,220
2003	Avg	22,359	22,359	22,359	22,359	22,359	22,359	22,359	22,359
2004	Dry	15,264	15,264	15,264	15,264	15,264	15,264	15,264	15,264
2005	Avg	18,969	18,969	18,969	18,969	18,969	18,969	18,969	18,969
2006	Avg	32,090	32,090	32,090	32,090	32,090	32,090	32,090	32,090
2007	Dry	34,888	34,888	34,888	34,888	34,888	34,888	34,888	34,888
2008	Wet	35,743	35,743	35,743	35,743	35,743	35,743	35,743	35,743
2009	Avg	27,396	27,396	27,396	27,396	27,396	27,396	27,396	27,396
Average		30,614	30,343	30,338	30,329	30,317	30,338	30,331	30,372
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1984	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1985	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1986	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1987	Avg	-	-	-193 (-0.5)	-193 (-0.5)	-193 (-0.5)	-193 (-0.5)	-193 (-0.5)	709 (1.9)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-	92 (0.2)	-196 (-0.5)	-503 (-1.2)	79 (0.2)	-123 (-0.3)	142 (0.3)
1996	Wet	-	-	-49 (-0.1)	-4 (0.0)	-30 (-0.1)	-19 (0.0)	-30 (-0.1)	-39 (-0.1)
1997	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-	-5 (0.0)	-14 (0.0)	-26 (-0.1)	-5 (0.0)	-12 (0.0)	29 (0.1)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1984	Wet	-	-53 (-0.1)	-53 (-0.1)	-53 (-0.1)	-53 (-0.1)	-53 (-0.1)	-53 (-0.1)	-53 (-0.1)
1985	Avg	-	-4,526 (-10.6)	-4,526 (-10.6)	-4,526 (-10.6)	-4,526 (-10.6)	-4,526 (-10.6)	-4,526 (-10.6)	-4,526 (-10.6)
1986	Wet	-	-203 (-0.6)	-203 (-0.6)	-203 (-0.6)	-203 (-0.6)	-203 (-0.6)	-203 (-0.6)	-203 (-0.6)
1987	Avg	-	-1,183 (-3.0)	-1,375 (-3.5)	-1,375 (-3.5)	-1,375 (-3.5)	-1,375 (-3.5)	-1,375 (-3.5)	-474 (-1.2)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-1,642 (-3.7)	-1,550 (-3.5)	-1,839 (-4.1)	-2,145 (-4.8)	-1,564 (-3.5)	-1,765 (-4.0)	-1,500 (-3.4)
1996	Wet	-	31 (0.1)	-18 (0.0)	27 (0.0)	1 (0.0)	13 (0.0)	1 (0.0)	-7 (0.0)
1997	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-271 (-0.9)	-276 (-0.9)	-285 (-0.9)	-296 (-1.0)	-275 (-0.9)	-283 (-0.9)	-242 (-0.8)

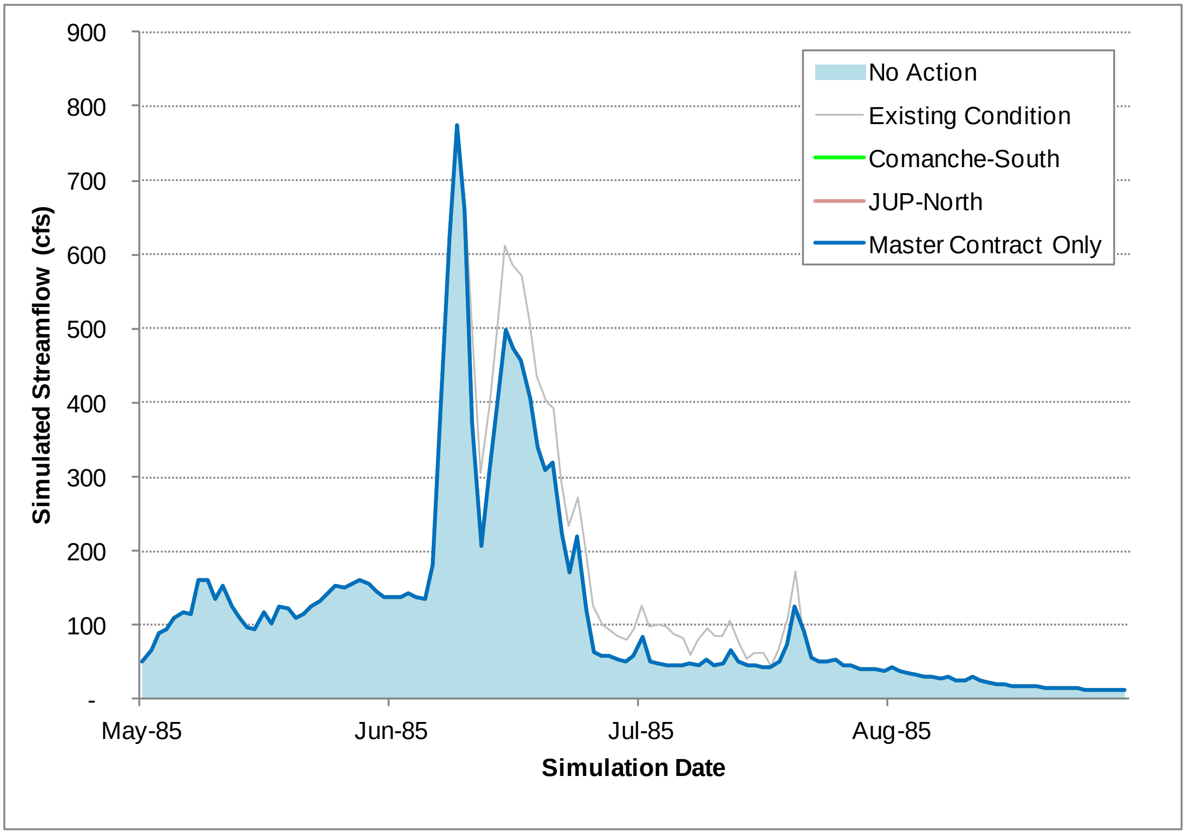


Figure 8. **Simulated Daily Streamflow (1985 Runoff Season) - Hunter Creek near Aspen (Cumulative Effects)**

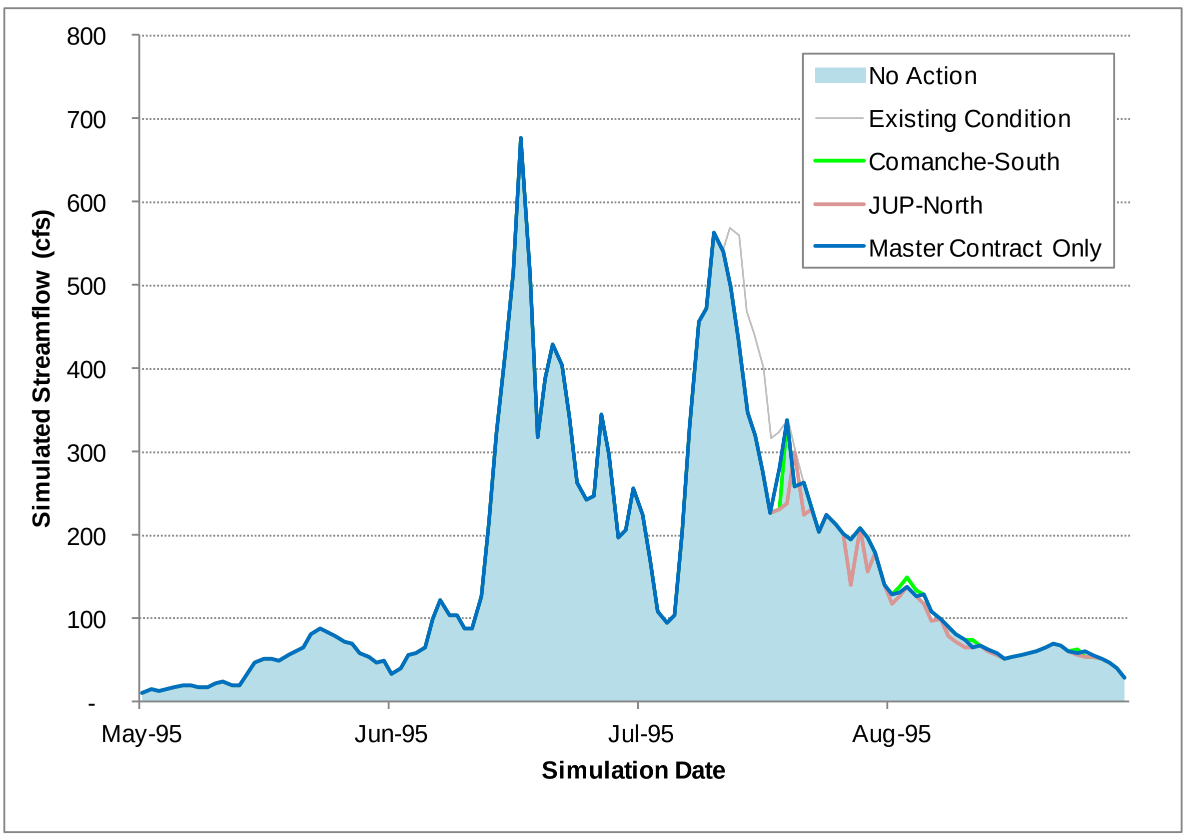


Figure 9. **Simulated Daily Streamflow (1995 Runoff Season) - Hunter Creek near Aspen (Cumulative Effects)**

Roaring Fork River above Difficult Creek near Aspen

Mean monthly direct effects for the Roaring Fork River above Difficult Creek gage are negligible (Table 23). Monthly effects range from a three cfs decrease to a three cfs increase, primarily during June. Monthly effects are negligible during the typical wet year (
Table 25), and there are no differences in streamflow during the typical normal and dry year (
Table 24 and
Table 26). Differences in streamflow result from slight differences in imports of water to the East Slope through the Twin Lakes Tunnel. Differences in imports result from differences in storage availability in the Twin Lakes Project accounts in Twin Lakes Reservoir and ability to transport this water through the Otero Pump Station and Homestake Pipeline from Twin Lakes into Colorado Springs and Aurora's local system storage reservoirs.

Differences in annual direct effects for streamflow are negligible for all years in the simulation and all alternatives except for 2001 (Table 27), during which all alternatives except the Joint Use Pipeline North Alternative show a minor decrease in streamflow from the No Action Alternative. Simulated streamflow is less than the No Action Alternative for all action alternatives except the Joint Use Pipeline North Alternative for about 1 week during mid to late June (Figure 10). For most dry years and normal years following dry years, there is no difference in annual streamflow direct effects.

Table 23. Mean Monthly Streamflow Overall Average– Roaring Fork River above Difficult Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	15	15	15	15	15	15	15	15
Feb	14	14	14	14	14	14	14	14
Mar	16	16	16	16	16	16	16	16
Apr	32	32	32	32	32	32	32	32
May	130	129	130	130	130	130	130	130
Jun	321	323	320	320	323	320	320	322
Jul	149	150	150	150	148	150	150	150
Aug	53	53	53	53	53	53	53	53
Sep	37	37	37	37	37	37	37	37
Oct	29	29	29	29	29	29	29	29
Nov	21	21	21	21	21	21	21	21
Dec	17	17	17	17	17	17	17	17
Average	69	69	69	69	69	69	69	69
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.1)
Jun	-	-	-3 (-0.8)	-3 (-0.8)	0 (0.0)	-3 (-0.9)	-3 (-0.8)	-1 (-0.3)
Jul	-	-	0 (0.2)	0 (0.2)	-1 (-0.9)	0 (0.2)	1 (0.4)	1 (0.4)
Aug	-	-	0 (-0.3)	0 (0.5)	1 (1.0)	0 (0.0)	0 (0.6)	1 (1.1)
Sep	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (-0.3)	0 (-0.2)	0 (-0.1)	0 (-0.3)	0 (-0.2)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (-0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	2 (0.5)	-1 (-0.3)	-1 (-0.3)	2 (0.5)	-1 (-0.4)	-1 (-0.4)	0 (0.1)
Jul	-	0 (0.3)	1 (0.5)	1 (0.4)	-1 (-0.6)	1 (0.4)	1 (0.6)	1 (0.7)
Aug	-	0 (-0.4)	0 (-0.8)	0 (0.1)	0 (0.6)	0 (-0.4)	0 (0.1)	0 (0.6)
Sep	-	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.2)	0 (-0.1)	0 (0.0)	0 (0.1)	0 (-0.1)	0 (0.0)	0 (0.2)

Table 24. Monthly Streamflow Normal Year (2005) – Roaring Fork River above Difficult Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	93	93	93	93	93	93	93	93
Feb	84	84	84	84	84	84	84	84
Mar	80	80	80	80	80	80	80	80
Apr	129	129	129	129	129	129	129	129
May	484	484	484	484	484	484	484	484
Jun	916	916	916	916	916	916	916	916
Jul	584	584	584	584	584	584	584	584
Aug	269	269	269	269	269	269	269	269
Sep	166	166	166	166	166	166	166	166
Oct	188	188	188	188	188	188	188	188
Nov	150	150	150	150	150	150	150	150
Dec	127	127	127	127	127	127	127	127
Average	273	273	273	273	273	273	273	273
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 25. Monthly Streamflow Wet Year (1997) – Roaring Fork River above Difficult Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	136	136	136	136	136	136	136	136
Feb	107	107	107	107	107	107	107	107
Mar	111	111	111	111	111	111	111	111
Apr	163	163	163	163	163	163	163	163
May	647	647	647	647	647	647	647	647
Jun	2146	2145	2135	2135	2145	2135	2135	2141
Jul	928	926	928	929	927	928	928	928
Aug	368	368	368	368	368	368	368	368
Sep	291	291	291	291	291	291	291	291
Oct	238	238	238	238	238	238	238	238
Nov	181	181	181	181	181	181	181	181
Dec	146	146	146	146	146	146	146	146
Average	455	455	454	454	455	454	454	455
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-10 (-0.5)	-10 (-0.5)	0 (0.0)	-10 (-0.5)	-10 (-0.5)	-4 (-0.2)
Jul	-	-	3 (0.3)	3 (0.3)	1 (0.1)	3 (0.3)	3 (0.3)	2 (0.3)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-1 (-0.1)	-11 (-0.5)	-12 (-0.5)	-1 (0.0)	-11 (-0.5)	-11 (-0.5)	-6 (-0.3)
Jul	-	-3 (-0.3)	0 (0.0)	0 (0.0)	-2 (-0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (-0.1)	-1 (-0.2)	-1 (-0.2)	0 (-0.1)	-1 (-0.2)	-1 (-0.2)	0 (-0.1)

Table 26. Monthly Streamflow Dry Year (2004) – Roaring Fork River above Difficult Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	87	87	87	87	87	87	87	87
Feb	78	78	78	78	78	78	78	78
Mar	98	98	98	98	98	98	98	98
Apr	146	146	146	146	146	146	146	146
May	464	464	464	464	464	464	464	464
Jun	700	700	700	700	700	700	700	700
Jul	348	348	348	348	348	348	348	348
Aug	161	161	161	161	161	161	161	161
Sep	136	136	136	136	136	136	136	136
Oct	146	146	146	146	146	146	146	146
Nov	121	121	121	121	121	121	121	121
Dec	103	103	103	103	103	103	103	103
Average	216	216	216	216	216	216	216	216
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 27. Simulated Annual Streamflow – Roaring Fork River above Difficult Creek (Direct Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	41,159	41,159	41,159	41,159	41,159	41,159	41,159	41,159
1983	Avg	80,640	80,934	81,111	80,871	81,022	80,593	80,491	81,182
1984	Wet	108,996	110,306	109,383	109,109	109,017	109,352	109,308	109,978
1985	Avg	84,338	84,734	84,668	84,591	84,417	84,621	84,621	84,706
1986	Wet	59,628	59,479	59,195	59,464	59,275	59,131	59,589	59,797
1987	Avg	73,620	73,706	73,563	73,681	73,645	73,686	73,558	73,741
1988	Dry	33,976	33,976	33,976	33,976	33,976	33,976	33,976	33,976
1989	Dry	28,463	28,463	28,463	28,463	28,463	28,463	28,463	28,463
1990	Dry	37,858	37,858	37,858	37,858	37,858	37,858	37,858	37,858
1991	Avg	42,341	42,341	42,341	42,341	42,341	42,341	42,341	42,341
1992	Avg	36,221	36,221	36,221	36,221	36,221	36,221	36,221	36,221
1993	Wet	56,820	56,742	56,821	56,794	56,777	56,767	56,774	56,832
1994	Avg	37,504	37,504	37,515	37,449	37,538	37,517	37,621	37,450
1995	Wet	105,805	104,932	105,002	105,685	104,643	105,518	106,061	106,372
1996	Wet	60,557	61,137	60,862	60,868	61,364	60,841	60,988	61,828
1997	Wet	73,159	72,925	72,483	72,463	72,989	72,504	72,476	72,817
1998	Avg	35,970	35,970	35,970	35,970	35,970	35,970	35,970	35,970
1999	Avg	65,830	66,962	66,667	66,842	67,385	66,648	66,568	66,549
2000	Dry	36,981	36,981	36,981	36,981	36,981	36,981	36,981	36,981
2001	Avg	28,291	28,382	27,388	27,495	28,257	27,425	27,388	27,388
2002	Dry	22,047	22,047	22,047	22,047	22,047	22,047	22,047	22,047
2003	Avg	27,415	27,415	27,415	27,415	27,415	27,415	27,415	27,415
2004	Dry	20,460	20,460	20,460	20,460	20,460	20,460	20,460	20,460
2005	Avg	24,439	24,439	24,439	24,439	24,439	24,439	24,439	24,439
2006	Avg	29,575	29,575	29,575	29,575	29,575	29,575	29,575	29,575
2007	Dry	41,283	40,840	40,686	40,696	40,898	40,602	40,770	40,807
2008	Wet	65,023	65,028	64,995	64,994	65,004	64,995	65,004	65,001
2009	Avg	53,754	54,271	53,733	53,735	54,415	53,742	53,735	53,734
Average		50,434	50,528	50,392	50,416	50,484	50,387	50,424	50,539
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	177 (0.2)	-63 (-0.1)	88 (0.1)	-341 (-0.4)	-443 (-0.5)	248 (0.3)
1984	Wet	-	-	-923 (-0.8)	-1,197 (-1.1)	-1,289 (-1.2)	-954 (-0.9)	-997 (-0.9)	-328 (-0.3)
1985	Avg	-	-	-66 (-0.1)	-143 (-0.2)	-317 (-0.4)	-113 (-0.1)	-113 (-0.1)	-28 (0.0)
1986	Wet	-	-	-284 (-0.5)	-15 (0.0)	-203 (-0.3)	-347 (-0.6)	110 (0.2)	318 (0.5)
1987	Avg	-	-	-143 (-0.2)	-25 (0.0)	-61 (-0.1)	-20 (0.0)	-148 (-0.2)	35 (0.0)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	79 (0.1)	52 (0.1)	35 (0.1)	25 (0.0)	32 (0.1)	90 (0.2)
1994	Avg	-	-	10 (0.0)	-56 (-0.1)	34 (0.1)	13 (0.0)	117 (0.3)	-55 (-0.1)
1995	Wet	-	-	70 (0.1)	753 (0.7)	-288 (-0.3)	586 (0.6)	1,129 (1.1)	1,440 (1.4)
1996	Wet	-	-	-274 (-0.4)	-269 (-0.4)	227 (0.4)	-296 (-0.5)	-148 (-0.2)	691 (1.1)
1997	Wet	-	-	-442 (-0.6)	-462 (-0.6)	64 (0.1)	-421 (-0.6)	-449 (-0.6)	-107 (-0.1)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	-294 (-0.4)	-120 (-0.2)	424 (0.6)	-314 (-0.5)	-393 (-0.6)	-412 (-0.6)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	-994 (-3.5)	-886 (-3.1)	-125 (-0.4)	-957 (-3.4)	-994 (-3.5)	-994 (-3.5)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	-154 (-0.4)	-144 (-0.4)	58 (0.1)	-238 (-0.6)	-70 (-0.2)	-33 (-0.1)
2008	Wet	-	-	-34 (-0.1)	-34 (-0.1)	-24 (0.0)	-33 (-0.1)	-24 (0.0)	-28 (0.0)
2009	Avg	-	-	-539 (-1.0)	-536 (-1.0)	144 (0.3)	-529 (-1.0)	-536 (-1.0)	-538 (-1.0)
Average		-	-	-136 (-0.3)	-112 (-0.2)	-44 (-0.1)	-141 (-0.3)	-105 (-0.2)	11 (0.0)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	294 (0.4)	471 (0.6)	231 (0.3)	382 (0.5)	-47 (-0.1)	-150 (-0.2)	542 (0.7)
1984	Wet	-	1,310 (1.2)	387 (0.4)	113 (0.1)	21 (0.0)	356 (0.3)	312 (0.3)	982 (0.9)
1985	Avg	-	396 (0.5)	330 (0.4)	253 (0.3)	79 (0.1)	283 (0.3)	283 (0.3)	368 (0.4)
1986	Wet	-	-150 (-0.3)	-433 (-0.7)	-165 (-0.3)	-353 (-0.6)	-497 (-0.8)	-40 (-0.1)	168 (0.3)
1987	Avg	-	86 (0.1)	-56 (-0.1)	61 (0.1)	25 (0.0)	67 (0.1)	-62 (-0.1)	122 (0.2)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-78 (-0.1)	1 (0.0)	-26 (0.0)	-43 (-0.1)	-53 (-0.1)	-46 (-0.1)	12 (0.0)
1994	Avg	-	0 (0.0)	10 (0.0)	-56 (-0.1)	34 (0.1)	13 (0.0)	117 (0.3)	-55 (-0.1)
1995	Wet	-	-873 (-0.8)	-803 (-0.8)	-120 (-0.1)	-1,161 (-1.1)	-287 (-0.3)	256 (0.2)	567 (0.5)
1996	Wet	-	579 (1.0)	305 (0.5)	310 (0.5)	806 (1.3)	283 (0.5)	431 (0.7)	1,270 (2.1)
1997	Wet	-	-234 (-0.3)	-676 (-0.9)	-696 (-1.0)	-170 (-0.2)	-655 (-0.9)	-683 (-0.9)	-341 (-0.5)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	1,132 (1.7)	838 (1.3)	1,012 (1.5)	1,556 (2.4)	818 (1.2)	739 (1.1)	719 (1.1)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	91 (0.3)	-903 (-3.2)	-796 (-2.8)	-34 (-0.1)	-866 (-3.1)	-903 (-3.2)	-903 (-3.2)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-443 (-1.1)	-596 (-1.4)	-587 (-1.4)	-385 (-0.9)	-681 (-1.6)	-513 (-1.2)	-476 (-1.2)
2008	Wet	-	6 (0.0)	-28 (0.0)	-29 (0.0)	-19 (0.0)	-28 (0.0)	-19 (0.0)	-22 (0.0)
2009	Avg	-	518 (1.0)	-21 (0.0)	-18 (0.0)	662 (1.2)	-12 (0.0)	-18 (0.0)	-20 (0.0)
Average		-	94 (0.2)	-42 (-0.1)	-18 (0.0)	50 (0.1)	-47 (-0.1)	-11 (0.0)	105 (0.2)

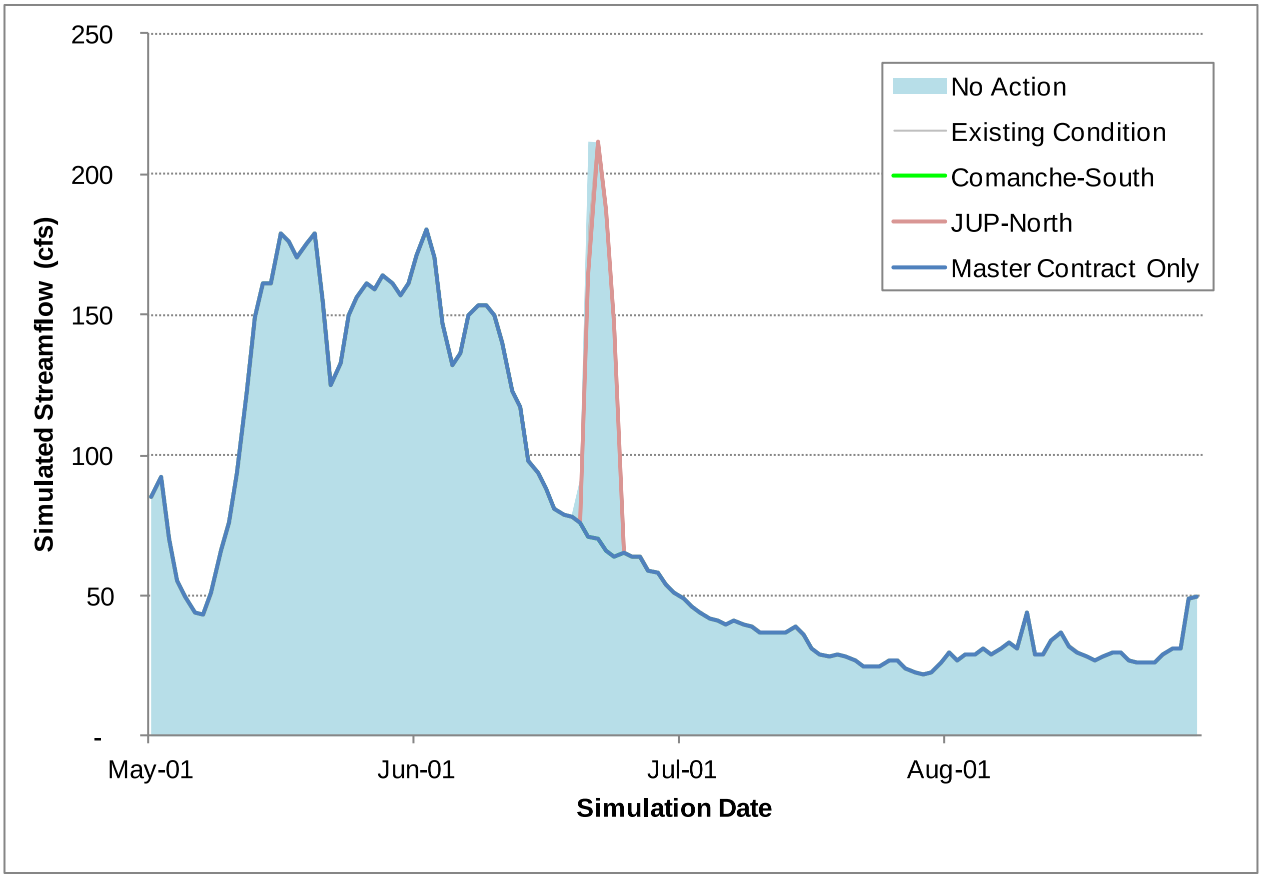


Figure 10. Simulated Daily Streamflow (2001 Runoff Season) - Roaring Fork River above Difficult Creek (Direct Effects)

Mean monthly cumulative effects for the Roaring Fork River above Difficult Creek gage are negligible except during July for all alternatives other than the River-South Alternative (Table 28). Mean monthly cumulative effects for streamflow is generally lower than the existing conditions streamflow due to increased transmountain diversions through the Twin Lakes Tunnel to meet increased municipal demand on the East Slope.

Monthly effects are negligible to minor during the typical wet year (
Table 30), with all action alternatives showing minor effects during either June or July (depending on timing of diversions through the Twin Lakes Tunnel). There are no differences in streamflow during the typical normal and dry year (
Table 29 and
Table 31).

Differences in the annual cumulative effects for streamflow range from no effect to minor (Table 32). Cumulative effects and differences from existing conditions are greatest during wet years and normal years following wet years. During dry years and normal years following dry years, diversions through the Twin Lakes Tunnel are typically maximized, thus, diversions are the same for all alternatives. Simulated streamflow for 1994 and 2008, two years showing the greatest cumulative effects and differences from existing conditions, is shown in Figure 11 and Figure 12, respectively. In 1994, streamflow for all alternatives is less than existing conditions during early June, and varies between alternatives during mid- to late June. In 2008, streamflow is less than existing conditions from mid-June through mid-July for all alternatives, and all action alternatives show lower streamflow than the No Action Alternative from late June through mid-July.

Table 28. Mean Monthly Streamflow Overall Average– Roaring Fork River above Difficult Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	15	15	15	15	15	15	15	15
Feb	14	14	14	14	14	14	14	14
Mar	16	16	16	16	16	16	16	16
Apr	32	32	32	32	32	32	32	32
May	130	129	129	129	129	129	129	129
Jun	321	275	272	273	273	273	274	272
Jul	149	144	141	141	140	140	142	140
Aug	53	52	53	53	52	52	52	52
Sep	37	37	37	37	37	37	37	37
Oct	29	29	29	29	29	29	29	29
Nov	21	21	21	21	21	21	21	21
Dec	17	17	17	17	17	17	17	17
Average	69	65	64	64	64	64	65	64
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.1)	0 (0.0)	0 (-0.1)	0 (0.0)	0 (0.0)	0 (-0.3)
Jun	-	-	-2 (-0.9)	-2 (-0.6)	-2 (-0.7)	-2 (-0.8)	-1 (-0.4)	-3 (-1.1)
Jul	-	-	-3 (-2.1)	-3 (-2.0)	-3 (-2.4)	-3 (-2.3)	-2 (-1.2)	-4 (-2.5)
Aug	-	-	0 (0.7)	1 (1.3)	0 (0.6)	0 (0.1)	0 (0.2)	0 (0.3)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (-0.6)	0 (-0.5)	0 (-0.7)	0 (-0.7)	0 (-0.4)	-1 (-0.9)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (-0.3)	0 (-0.2)	0 (-0.3)	0 (-0.4)	0 (-0.3)	0 (-0.3)	-1 (-0.5)
Jun	-	-47 (-14.6)	-49 (-15.3)	-48 (-15.0)	-49 (-15.1)	-49 (-15.2)	-48 (-14.9)	-50 (-15.5)
Jul	-	-5 (-3.6)	-8 (-5.7)	-8 (-5.5)	-9 (-5.9)	-9 (-5.9)	-7 (-4.8)	-9 (-6.0)
Aug	-	-1 (-1.8)	-1 (-1.1)	0 (-0.6)	-1 (-1.3)	-1 (-1.7)	-1 (-1.6)	-1 (-1.5)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-5 (-6.5)	-5 (-7.1)	-5 (-7.0)	-5 (-7.1)	-5 (-7.2)	-5 (-6.9)	-5 (-7.3)

Table 29. Monthly Streamflow Normal Year (2005) – Roaring Fork River above Difficult Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	10	10	10	10	10	10	10	10
Feb	9	9	9	9	9	9	9	9
Mar	10	10	10	10	10	10	10	10
Apr	25	25	25	25	25	25	25	25
May	92	92	92	92	92	92	92	92
Jun	123	123	123	123	123	123	123	123
Jul	52	52	52	52	52	52	52	52
Aug	30	30	30	30	30	30	30	30
Sep	16	16	16	16	16	16	16	16
Oct	18	18	18	18	18	18	18	18
Nov	16	16	16	16	16	16	16	16
Dec	13	13	13	13	13	13	13	13
Average	35	35	35	35	35	35	35	35
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 30. Monthly Streamflow Wet Year (1997) – Roaring Fork River above Difficult Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	22	22	22	22	22	22	22	22
Feb	17	17	17	17	17	17	17	17
Mar	24	24	24	24	24	24	24	24
Apr	38	38	38	38	38	38	38	38
May	145	145	145	145	145	145	145	145
Jun	574	447	426	430	443	431	440	435
Jul	156	155	152	152	154	152	152	153
Aug	78	78	78	78	78	78	78	78
Sep	52	52	52	52	52	52	52	52
Oct	33	33	33	33	33	33	33	33
Nov	27	27	27	27	27	27	27	27
Dec	23	23	23	23	23	23	23	23
Average	99	88	86	87	88	87	88	87
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-22 (-4.8)	-17 (-3.9)	-5 (-1.0)	-16 (-3.7)	-7 (-1.6)	-12 (-2.8)
Jul	-	-	-3 (-1.9)	-3 (-2.0)	-1 (-0.7)	-3 (-1.9)	-3 (-1.6)	-2 (-1.1)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	-2 (-2.3)	-2 (-1.9)	0 (-0.5)	-2 (-1.8)	-1 (-0.9)	-1 (-1.3)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-127 (-22.1)	-148 (-25.8)	-144 (-25.1)	-131 (-22.9)	-143 (-25.0)	-134 (-23.3)	-139 (-24.3)
Jul	-	-1 (-0.8)	-4 (-2.6)	-4 (-2.8)	-2 (-1.5)	-4 (-2.7)	-4 (-2.4)	-3 (-1.9)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-11 (-10.6)	-13 (-12.7)	-12 (-12.4)	-11 (-11.1)	-12 (-12.3)	-11 (-11.4)	-12 (-11.8)

Table 31. Monthly Streamflow Dry Year (2004) – Roaring Fork River above Difficult Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	10	10	10	10	10	10	10	10
Feb	9	9	9	9	9	9	9	9
Mar	15	15	15	15	15	15	15	15
Apr	29	29	29	29	29	29	29	29
May	78	78	78	78	78	78	78	78
Jun	66	66	66	66	66	66	66	66
Jul	29	29	29	29	29	29	29	29
Aug	32	32	32	32	32	32	32	32
Sep	25	25	25	25	25	25	25	25
Oct	17	17	17	17	17	17	17	17
Nov	11	11	11	11	11	11	11	11
Dec	9	9	9	9	9	9	9	9
Average	28	28	28	28	28	28	28	28
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 32. Simulated Annual Streamflow – Roaring Fork River above Difficult Creek (Cumulative Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	41,159	41,159	41,159	41,159	41,159	41,159	41,159	41,159
1983	Avg	80,640	81,636	81,733	81,696	80,476	80,802	81,421	80,967
1984	Wet	108,996	101,505	101,600	101,651	101,517	101,604	101,542	101,631
1985	Avg	84,338	77,581	76,918	77,374	77,298	77,000	77,307	76,245
1986	Wet	59,628	57,607	57,324	57,631	58,230	57,654	57,423	55,702
1987	Avg	73,620	70,777	71,220	71,427	69,247	71,221	71,090	70,714
1988	Dry	33,976	33,976	33,976	33,976	33,976	33,976	33,976	33,976
1989	Dry	28,463	28,463	28,463	28,463	28,463	28,463	28,463	28,463
1990	Dry	37,858	37,858	37,858	37,858	37,858	37,858	37,858	37,858
1991	Avg	42,341	42,341	42,341	42,341	42,341	42,341	42,341	42,341
1992	Avg	36,221	36,221	36,221	36,221	36,221	36,221	36,221	36,221
1993	Wet	56,820	51,664	51,664	51,664	51,664	51,664	51,664	51,664
1994	Avg	37,504	32,431	30,893	30,931	31,288	31,223	32,442	32,579
1995	Wet	105,805	94,800	94,868	95,398	95,643	94,747	95,285	95,046
1996	Wet	60,557	51,623	52,513	52,276	51,114	51,573	51,603	50,554
1997	Wet	73,159	65,536	64,079	64,306	65,190	64,375	64,965	64,690
1998	Avg	35,970	35,970	35,970	35,970	35,970	35,970	35,970	35,970
1999	Avg	65,830	62,329	60,565	61,126	60,210	60,886	61,426	60,378
2000	Dry	36,981	36,981	36,981	36,981	36,981	36,981	36,981	36,981
2001	Avg	28,291	27,388	27,388	27,388	27,388	27,388	27,388	27,388
2002	Dry	22,047	22,047	22,047	22,047	22,047	22,047	22,047	22,047
2003	Avg	27,415	27,415	27,415	27,415	27,415	27,415	27,415	27,415
2004	Dry	20,460	20,460	20,460	20,460	20,460	20,460	20,460	20,460
2005	Avg	24,439	24,439	24,439	24,439	24,439	24,439	24,439	24,439
2006	Avg	29,575	29,575	29,575	29,575	29,575	29,575	29,575	29,575
2007	Dry	41,283	36,087	36,596	36,512	36,316	36,381	36,112	36,384
2008	Wet	65,023	55,171	50,539	50,579	51,782	50,577	51,836	50,797
2009	Avg	53,754	39,544	39,540	39,540	39,552	39,540	39,509	39,540
Average		50,434	47,235	46,941	47,014	46,922	46,912	47,069	46,828
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	96 (0.1)	59 (0.1)	-1,160 (-1.4)	-834 (-1.0)	-216 (-0.3)	-669 (-0.8)
1984	Wet	-	-	94 (0.1)	146 (0.1)	12 (0.0)	99 (0.1)	37 (0.0)	126 (0.1)
1985	Avg	-	-	-663 (-0.9)	-207 (-0.3)	-283 (-0.4)	-581 (-0.7)	-274 (-0.4)	-1,336 (-1.7)
1986	Wet	-	-	-283 (-0.5)	24 (0.0)	623 (1.1)	47 (0.1)	-184 (-0.3)	-1,905 (-3.3)
1987	Avg	-	-	443 (0.6)	650 (0.9)	-1,530 (-2.2)	444 (0.6)	313 (0.4)	-64 (-0.1)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	-1,538 (-4.7)	-1,500 (-4.6)	-1,144 (-3.5)	-1,208 (-3.7)	11 (0.0)	148 (0.5)
1995	Wet	-	-	68 (0.1)	598 (0.6)	842 (0.9)	-54 (-0.1)	485 (0.5)	246 (0.3)
1996	Wet	-	-	890 (1.7)	653 (1.3)	-509 (-1.0)	-50 (-0.1)	-20 (0.0)	-1,069 (-2.1)
1997	Wet	-	-	-1,457 (-2.2)	-1,230 (-1.9)	-346 (-0.5)	-1,161 (-1.8)	-571 (-0.9)	-846 (-1.3)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	-1,764 (-2.8)	-1,203 (-1.9)	-2,119 (-3.4)	-1,444 (-2.3)	-903 (-1.4)	-1,951 (-3.1)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	509 (1.4)	425 (1.2)	229 (0.6)	294 (0.8)	26 (0.1)	297 (0.8)
2008	Wet	-	-	-4,631 (-8.4)	-4,591 (-8.3)	-3,389 (-6.1)	-4,594 (-8.3)	-3,334 (-6.0)	-4,374 (-7.9)
2009	Avg	-	-	-4 (0.0)	-4 (0.0)	8 (0.0)	-4 (0.0)	-35 (-0.1)	-4 (0.0)
Average		-	-	-294 (-0.6)	-221 (-0.5)	-313 (-0.7)	-323 (-0.7)	-167 (-0.4)	-407 (-0.9)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	996 (1.2)	1,092 (1.4)	1,056 (1.3)	-164 (-0.2)	162 (0.2)	780 (1.0)	327 (0.4)
1984	Wet	-	-7,491 (-6.9)	-7,397 (-6.8)	-7,345 (-6.7)	-7,479 (-6.9)	-7,392 (-6.8)	-7,455 (-6.8)	-7,365 (-6.8)
1985	Avg	-	-6,757 (-8.0)	-7,420 (-8.8)	-6,964 (-8.3)	-7,040 (-8.3)	-7,338 (-8.7)	-7,031 (-8.3)	-8,093 (-9.6)
1986	Wet	-	-2,022 (-3.4)	-2,304 (-3.9)	-1,997 (-3.3)	-1,399 (-2.3)	-1,974 (-3.3)	-2,205 (-3.7)	-3,926 (-6.6)
1987	Avg	-	-2,842 (-3.9)	-2,399 (-3.3)	-2,192 (-3.0)	-4,373 (-5.9)	-2,399 (-3.3)	-2,529 (-3.4)	-2,906 (-3.9)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-5,156 (-9.1)	-5,156 (-9.1)	-5,156 (-9.1)	-5,156 (-9.1)	-5,156 (-9.1)	-5,156 (-9.1)	-5,156 (-9.1)
1994	Avg	-	-5,073 (-13.5)	-6,612 (-17.6)	-6,573 (-17.5)	-6,217 (-16.6)	-6,281 (-16.7)	-5,062 (-13.5)	-4,926 (-13.1)
1995	Wet	-	-11,004 (-10.4)	-10,936 (-10.3)	-10,406 (-9.8)	-10,162 (-9.6)	-11,058 (-10.5)	-10,520 (-9.9)	-10,759 (-10.2)
1996	Wet	-	-8,935 (-14.8)	-8,045 (-13.3)	-8,281 (-13.7)	-9,444 (-15.6)	-8,985 (-14.8)	-8,955 (-14.8)	-10,004 (-16.5)
1997	Wet	-	-7,623 (-10.4)	-9,080 (-12.4)	-8,853 (-12.1)	-7,969 (-10.9)	-8,784 (-12.0)	-8,193 (-11.2)	-8,469 (-11.6)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-3,501 (-5.3)	-5,264 (-8.0)	-4,703 (-7.1)	-5,620 (-8.5)	-4,944 (-7.5)	-4,404 (-6.7)	-5,452 (-8.3)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-903 (-3.2)	-903 (-3.2)	-903 (-3.2)	-903 (-3.2)	-903 (-3.2)	-903 (-3.2)	-903 (-3.2)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-5,196 (-12.6)	-4,687 (-11.4)	-4,771 (-11.6)	-4,967 (-12.0)	-4,902 (-11.9)	-5,171 (-12.5)	-4,899 (-11.9)
2008	Wet	-	-9,852 (-15.2)	-14,484 (-22.3)	-14,443 (-22.2)	-13,241 (-20.4)	-14,446 (-22.2)	-13,187 (-20.3)	-14,226 (-21.9)
2009	Avg	-	-14,210 (-26.4)	-14,213 (-26.4)	-14,214 (-26.4)	-14,201 (-26.4)	-14,213 (-26.4)	-14,244 (-26.5)	-14,213 (-26.4)
Average		-	-3,199 (-6.3)	-3,493 (-6.9)	-3,420 (-6.8)	-3,512 (-7.0)	-3,522 (-7.0)	-3,366 (-6.7)	-3,606 (-7.2)

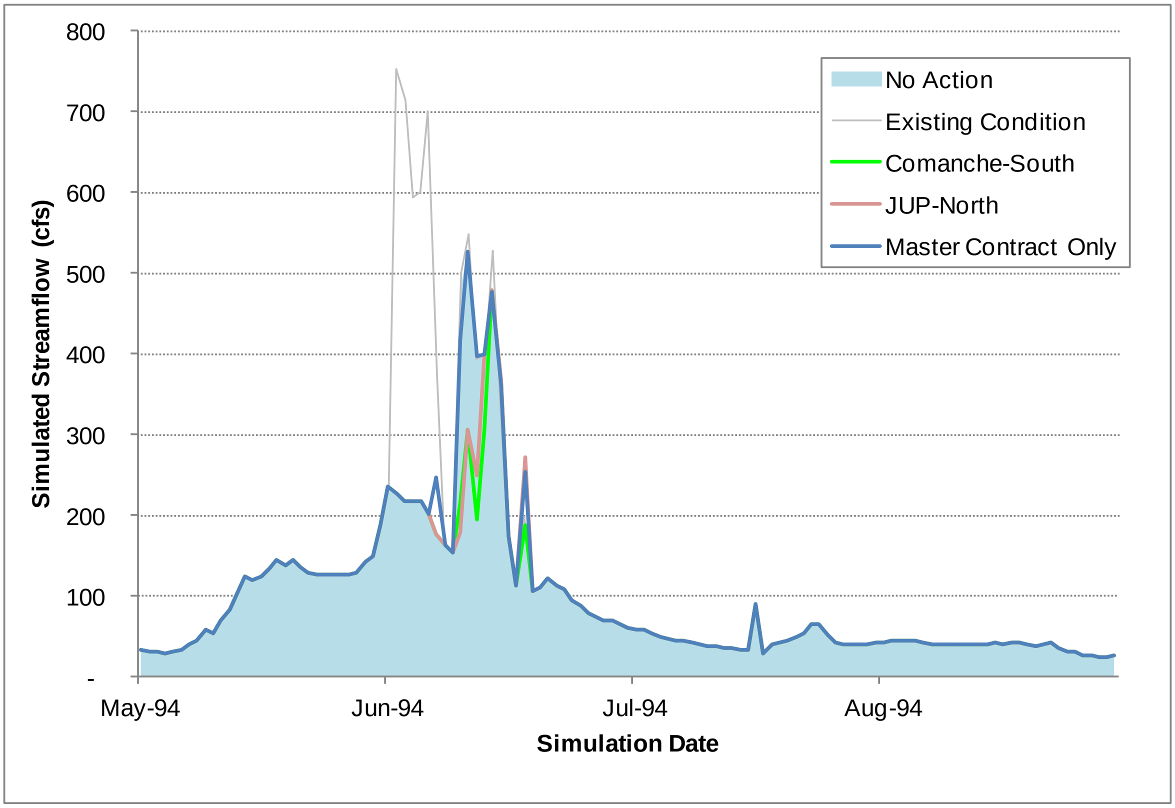


Figure 11. Simulated Daily Streamflow (1994 Runoff Season) - Roaring Fork River above Difficult Creek (Cumulative Effects)

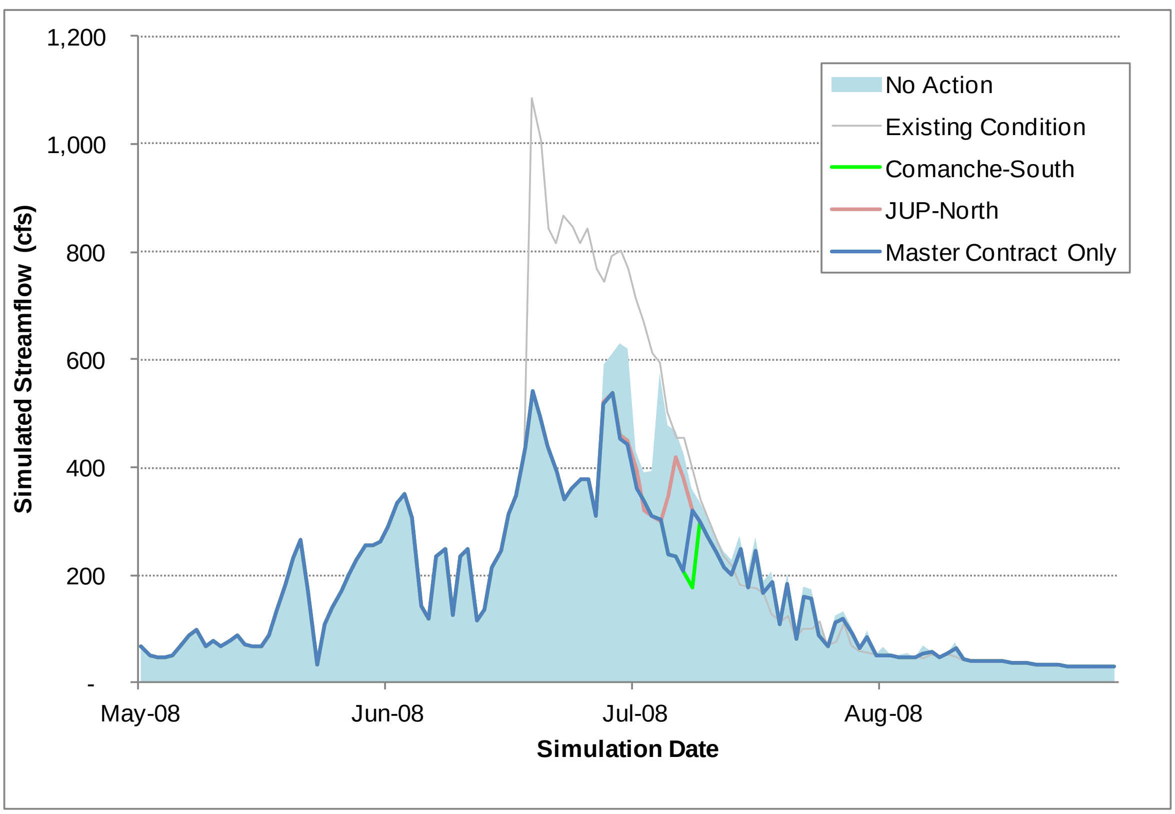


Figure 12. Simulated Daily Streamflow (2008 Runoff Season) - Roaring Fork River above Difficult Creek (Cumulative Effects)

Roaring Fork River below Maroon Creek near Aspen

The Roaring Fork below Maroon Creek near Aspen gage is located about three miles downstream from the Hunter Creek confluence with the Roaring Fork River. The gage is influenced by both Fry-Ark diversions and Twin Lakes Project diversions. There are several tributary gages between the Roaring Fork above Difficult Creek gage and the Maroon Creek gage, so average annual streamflow at the Maroon Creek gage is approximately three times greater than the sum of average annual streamflow at the Roaring Fork above Difficult Creek and Hunter Creek gages.

The period of record for the Roaring Fork below Maroon Creek gage is November 1988 to present. For purposes of this analysis, monthly averages include the period of November 1988 to October 2009, while annual averages include water years 1990 through 2009 because one month of water year 1989 is missing.

Mean monthly direct effects for the Roaring Fork below Maroon Creek gage are negligible for all alternatives (Table 33). Additionally, there are no monthly effects during typical normal and dry years (Table 34 and
Table 36), and negligible effects during the typical wet years (
Table 35). Differences in monthly wet-year streamflow occur in June and July due to differences in the timing of transmountain diversions by the Fry-Ark and Twin Lakes Project collection systems.

Annual streamflow effects are negligible for all alternatives (Table 37). Differences in simulated annual streamflow occur during wet years and occasionally during dry and normal years, especially following wet years. Differences in simulated daily streamflow during 1995, a wet year with negligible increases and decreases in annual streamflow, primarily occur late July and early August (Figure 13).

Table 33. Mean Monthly Streamflow Overall Average– Roaring Fork River below Maroon Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	109	109	109	109	109	109	109	109
Feb	97	97	97	97	97	97	97	97
Mar	99	99	99	99	99	99	99	99
Apr	157	157	157	157	157	157	157	157
May	580	580	580	580	580	580	580	580
Jun	1161	1163	1161	1161	1163	1161	1161	1162
Jul	650	649	650	650	648	650	650	650
Aug	273	273	273	273	274	273	273	274
Sep	191	191	191	191	191	191	191	191
Oct	178	178	178	178	178	178	178	178
Nov	142	142	142	142	142	142	142	142
Dec	120	120	120	120	120	120	120	120
Average	312	312	312	312	312	312	312	312
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-2 (-0.2)	-2 (-0.2)	0 (0.0)	-2 (-0.2)	-2 (-0.1)	0 (0.0)
Jul	-	-	1 (0.1)	0 (0.1)	-1 (-0.1)	1 (0.1)	1 (0.1)	1 (0.1)
Aug	-	-	0 (-0.1)	0 (0.2)	1 (0.3)	0 (0.1)	1 (0.2)	1 (0.3)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	1 (0.1)	-1 (-0.1)	-1 (-0.1)	2 (0.1)	-1 (-0.1)	0 (0.0)	1 (0.1)
Jul	-	0 (-0.1)	0 (0.0)	0 (0.0)	-1 (-0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (-0.1)	-1 (-0.2)	0 (0.0)	0 (0.1)	0 (-0.1)	0 (0.1)	0 (0.2)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Note: Period-of-record for Roaring Fork below Maroon Creek near Aspen gage is November 1988 through present. Monthly averages include this period only.

Table 34. Monthly Streamflow Normal Year (2005) – Roaring Fork River below Maroon Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	93	93	93	93	93	93	93	93
Feb	84	84	84	84	84	84	84	84
Mar	80	80	80	80	80	80	80	80
Apr	129	129	129	129	129	129	129	129
May	484	484	484	484	484	484	484	484
Jun	916	916	916	916	916	916	916	916
Jul	584	584	584	584	584	584	584	584
Aug	269	269	269	269	269	269	269	269
Sep	166	166	166	166	166	166	166	166
Oct	188	188	188	188	188	188	188	188
Nov	150	150	150	150	150	150	150	150
Dec	127	127	127	127	127	127	127	127
Average	273	273	273	273	273	273	273	273
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 35. Monthly Streamflow Wet Year (1997) – Roaring Fork River below Maroon Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	136	136	136	136	136	136	136	136
Feb	107	107	107	107	107	107	107	107
Mar	111	111	111	111	111	111	111	111
Apr	163	163	163	163	163	163	163	163
May	647	647	647	647	647	647	647	647
Jun	2146	2145	2135	2135	2145	2135	2135	2141
Jul	928	926	928	929	927	928	928	928
Aug	368	368	368	368	368	368	368	368
Sep	291	291	291	291	291	291	291	291
Oct	238	238	238	238	238	238	238	238
Nov	181	181	181	181	181	181	181	181
Dec	146	146	146	146	146	146	146	146
Average	455	455	454	454	455	454	454	455
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-10 (-0.5)	-10 (-0.5)	0 (0.0)	-10 (-0.5)	-10 (-0.5)	-4 (-0.2)
Jul	-	-	3 (0.3)	3 (0.3)	1 (0.1)	3 (0.3)	3 (0.3)	2 (0.3)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	-1 (-0.1)	-1 (-0.1)	0 (0.0)	-1 (-0.1)	-1 (-0.1)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-1 (-0.1)	-11 (-0.5)	-12 (-0.5)	-1 (0.0)	-11 (-0.5)	-11 (-0.5)	-6 (-0.3)
Jul	-	-3 (-0.3)	0 (0.0)	0 (0.0)	-2 (-0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (-0.1)	-1 (-0.2)	-1 (-0.2)	0 (-0.1)	-1 (-0.2)	-1 (-0.2)	0 (-0.1)

Table 36. Monthly Streamflow Dry Year (2004) – Roaring Fork River below Maroon Creek (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	87	87	87	87	87	87	87	87
Feb	78	78	78	78	78	78	78	78
Mar	98	98	98	98	98	98	98	98
Apr	146	146	146	146	146	146	146	146
May	464	464	464	464	464	464	464	464
Jun	700	700	700	700	700	700	700	700
Jul	348	348	348	348	348	348	348	348
Aug	161	161	161	161	161	161	161	161
Sep	136	136	136	136	136	136	136	136
Oct	146	146	146	146	146	146	146	146
Nov	121	121	121	121	121	121	121	121
Dec	103	103	103	103	103	103	103	103
Average	216	216	216	216	216	216	216	216
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 37. Simulated Annual Streamflow – Roaring Fork River below Maroon Creek (Direct Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	169,374	169,374	169,374	169,374	169,374	169,374	169,374	169,374
1991	Avg	201,797	201,797	201,797	201,797	201,797	201,797	201,797	201,797
1992	Avg	177,974	177,974	177,974	177,974	177,974	177,974	177,974	177,974
1993	Wet	279,702	279,624	279,703	279,676	279,659	279,649	279,656	279,714
1994	Avg	199,963	199,963	199,973	199,907	199,997	199,976	200,080	199,908
1995	Wet	447,448	446,251	446,375	447,137	445,893	446,926	447,527	447,999
1996	Wet	301,159	301,792	301,490	301,493	301,994	301,467	301,604	302,469
1997	Wet	328,719	328,485	328,043	328,023	328,549	328,065	328,037	328,378
1998	Avg	219,969	219,969	219,969	219,969	219,969	219,969	219,969	219,969
1999	Avg	252,039	253,334	253,497	253,302	253,595	253,556	253,624	253,908
2000	Dry	192,234	192,234	192,234	192,234	192,234	192,234	192,234	192,234
2001	Avg	181,360	181,451	180,457	180,565	181,326	180,494	180,457	180,457
2002	Dry	112,846	112,846	112,846	112,846	112,846	112,846	112,846	112,846
2003	Avg	177,726	177,726	177,726	177,726	177,726	177,726	177,726	177,726
2004	Dry	155,648	155,648	155,648	155,648	155,648	155,648	155,648	155,648
2005	Avg	191,919	191,919	191,919	191,919	191,919	191,919	191,919	191,919
2006	Avg	204,568	204,568	204,568	204,568	204,568	204,568	204,568	204,568
2007	Dry	213,424	212,981	212,828	212,838	213,039	212,743	212,911	212,948
2008	Wet	327,686	327,691	327,657	327,657	327,667	327,658	327,667	327,664
2009	Avg	265,565	266,083	265,544	265,546	266,227	265,553	265,547	265,545
Average		230,056	230,086	229,981	230,010	230,100	230,007	230,058	230,152
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	79 (0.0)	52 (0.0)	35 (0.0)	25 (0.0)	32 (0.0)	90 (0.0)
1994	Avg	-	-	10 (0.0)	-56 (0.0)	34 (0.0)	13 (0.0)	117 (0.1)	-55 (0.0)
1995	Wet	-	-	124 (0.0)	886 (0.2)	-359 (-0.1)	675 (0.2)	1,276 (0.3)	1,748 (0.4)
1996	Wet	-	-	-302 (-0.1)	-299 (-0.1)	202 (0.1)	-325 (-0.1)	-187 (-0.1)	678 (0.2)
1997	Wet	-	-	-442 (-0.1)	-462 (-0.1)	64 (0.0)	-421 (-0.1)	-449 (-0.1)	-107 (0.0)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	163 (0.1)	-32 (0.0)	261 (0.1)	222 (0.1)	290 (0.1)	574 (0.2)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	-994 (-0.5)	-886 (-0.5)	-125 (-0.1)	-957 (-0.5)	-994 (-0.5)	-994 (-0.5)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	-154 (-0.1)	-144 (-0.1)	58 (0.0)	-238 (-0.1)	-70 (0.0)	-33 (0.0)
2008	Wet	-	-	-34 (0.0)	-34 (0.0)	-24 (0.0)	-33 (0.0)	-24 (0.0)	-28 (0.0)
2009	Avg	-	-	-539 (-0.2)	-536 (-0.2)	144 (0.1)	-529 (-0.2)	-536 (-0.2)	-538 (-0.2)
Average		-	-	-104 (0.0)	-76 (0.0)	14 (0.0)	-78 (0.0)	-27 (0.0)	67 (0.0)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-78 (0.0)	1 (0.0)	-26 (0.0)	-43 (0.0)	-53 (0.0)	-46 (0.0)	12 (0.0)
1994	Avg	-	0 (0.0)	10 (0.0)	-56 (0.0)	34 (0.0)	13 (0.0)	117 (0.1)	-55 (0.0)
1995	Wet	-	-1,197 (-0.3)	-1,074 (-0.2)	-311 (-0.1)	-1,556 (-0.3)	-522 (-0.1)	79 (0.0)	551 (0.1)
1996	Wet	-	633 (0.2)	331 (0.1)	334 (0.1)	835 (0.3)	308 (0.1)	445 (0.1)	1,310 (0.4)
1997	Wet	-	-234 (-0.1)	-676 (-0.2)	-696 (-0.2)	-170 (-0.1)	-655 (-0.2)	-683 (-0.2)	-341 (-0.1)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	1,295 (0.5)	1,458 (0.6)	1,263 (0.5)	1,556 (0.6)	1,517 (0.6)	1,585 (0.6)	1,869 (0.7)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	91 (0.0)	-903 (-0.5)	-796 (-0.4)	-34 (0.0)	-866 (-0.5)	-903 (-0.5)	-903 (-0.5)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-443 (-0.2)	-596 (-0.3)	-587 (-0.3)	-385 (-0.2)	-681 (-0.3)	-513 (-0.2)	-476 (-0.2)
2008	Wet	-	6 (0.0)	-28 (0.0)	-29 (0.0)	-19 (0.0)	-28 (0.0)	-19 (0.0)	-22 (0.0)
2009	Avg	-	518 (0.2)	-21 (0.0)	-18 (0.0)	662 (0.2)	-12 (0.0)	-18 (0.0)	-20 (0.0)
Average		-	29 (0.0)	-75 (0.0)	-46 (0.0)	44 (0.0)	-49 (0.0)	2 (0.0)	96 (0.0)

Note: Period-of-record for Roaring Fork below Maroon Creek near Aspen gage is November 1988 through present. Data shown for water years 1990-2009 only.

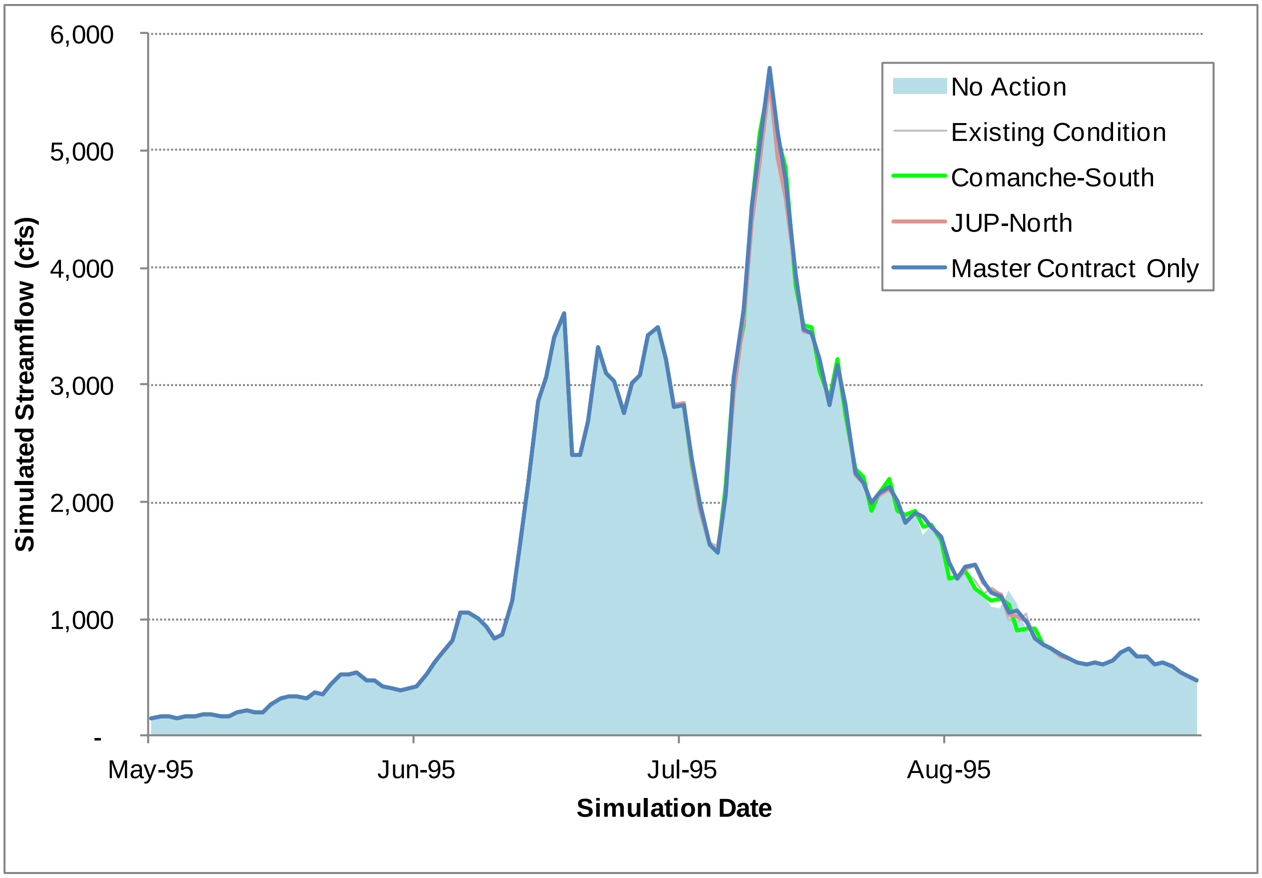


Figure 13. Simulated Daily Streamflow (1995 Runoff Season) - Roaring Fork River below Maroon Creek (Direct Effects)

Mean monthly cumulative effects for the Roaring Fork below Maroon Creek gage are negligible for all alternatives (Table 38). There are no monthly effects during typical normal and dry years (Table 39 and Table 41). There are negligible reductions in monthly streamflow from the No Action Alternative during June and July the typical wet year (
Table 40). As with the Hunter Creek and Roaring Fork River above Difficult Creek gages, cumulative effects streamflow is less for all alternatives than existing conditions due to increased transmountain diversions by Fry-Ark and the Twin Lakes Project to meet increased municipal demand.

Annual streamflow effects are negligible for all alternatives (Table 37). Simulated annual streamflow during dry and normal years is typically the same as existing conditions, while streamflow during wet years and occasionally during dry and normal years that follow wet years, is lower than existing conditions. Differences in streamflow from existing conditions during 2009, a wet year with the highest differences from existing conditions, primarily occur during peak runoff conditions during June and early July (Figure 14).

Table 38. Mean Monthly Streamflow Overall Average– Roaring Fork River below Maroon Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	109	109	109	109	109	109	109	109
Feb	97	97	97	97	97	97	97	97
Mar	99	99	99	99	99	99	99	99
Apr	157	157	157	157	157	157	157	157
May	580	580	580	580	580	580	580	580
Jun	1161	1114	1112	1112	1112	1112	1114	1112
Jul	650	642	638	638	638	638	639	638
Aug	273	272	272	272	272	272	272	272
Sep	191	191	191	191	191	191	191	191
Oct	178	178	178	178	178	178	178	178
Nov	142	142	142	142	142	142	142	142
Dec	120	120	120	120	120	120	120	120
Average	312	307	306	306	306	306	307	306
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-2 (-0.2)	-2 (-0.2)	-2 (-0.2)	-2 (-0.2)	-1 (0.0)	-2 (-0.2)
Jul	-	-	-4 (-0.6)	-4 (-0.6)	-4 (-0.6)	-4 (-0.6)	-2 (-0.4)	-3 (-0.5)
Aug	-	-	0 (0.0)	0 (0.2)	0 (0.2)	0 (0.0)	0 (0.1)	0 (0.1)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (-0.2)	0 (-0.1)	0 (-0.1)	0 (-0.2)	0 (-0.1)	0 (-0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-47 (-4.1)	-49 (-4.2)	-49 (-4.2)	-49 (-4.2)	-49 (-4.2)	-48 (-4.1)	-49 (-4.2)
Jul	-	-8 (-1.3)	-12 (-1.9)	-12 (-1.9)	-12 (-1.9)	-12 (-1.9)	-11 (-1.7)	-12 (-1.8)
Aug	-	-1 (-0.5)	-1 (-0.5)	-1 (-0.3)	-1 (-0.3)	-1 (-0.5)	-1 (-0.5)	-1 (-0.4)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-5 (-1.5)	-5 (-1.7)	-5 (-1.7)	-5 (-1.7)	-5 (-1.7)	-5 (-1.6)	-5 (-1.7)

Note: Period-of-record for Roaring Fork below Maroon Creek near Aspen gage is November 1988 through present. Monthly averages include this period only.

Table 39. Monthly Streamflow Normal Year (2005) – Roaring Fork River below Maroon Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	93	93	93	93	93	93	93	93
Feb	84	84	84	84	84	84	84	84
Mar	80	80	80	80	80	80	80	80
Apr	129	129	129	129	129	129	129	129
May	484	484	484	484	484	484	484	484
Jun	916	916	916	916	916	916	916	916
Jul	584	584	584	584	584	584	584	584
Aug	269	269	269	269	269	269	269	269
Sep	166	166	166	166	166	166	166	166
Oct	188	188	188	188	188	188	188	188
Nov	150	150	150	150	150	150	150	150
Dec	127	127	127	127	127	127	127	127
Average	273	273	273	273	273	273	273	273
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 40. Monthly Streamflow Wet Year (1997) – Roaring Fork River below Maroon Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	136	136	136	136	136	136	136	136
Feb	107	107	107	107	107	107	107	107
Mar	111	111	111	111	111	111	111	111
Apr	163	163	163	163	163	163	163	163
May	647	647	647	647	647	647	647	647
Jun	2146	2019	1998	2002	2015	2003	2012	2007
Jul	928	927	924	924	926	924	925	926
Aug	368	368	368	368	368	368	368	368
Sep	291	291	291	291	291	291	291	291
Oct	238	238	238	238	238	238	238	238
Nov	181	181	181	181	181	181	181	181
Dec	146	146	146	146	146	146	146	146
Average	455	445	443	443	444	443	444	444
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-22 (-1.1)	-17 (-0.9)	-5 (-0.2)	-16 (-0.8)	-7 (-0.3)	-12 (-0.6)
Jul	-	-	-3 (-0.3)	-3 (-0.3)	-1 (-0.1)	-3 (-0.3)	-3 (-0.3)	-2 (-0.2)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	-2 (-0.5)	-2 (-0.4)	0 (-0.1)	-2 (-0.4)	-1 (-0.2)	-1 (-0.3)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-127 (-5.9)	-148 (-6.9)	-144 (-6.7)	-131 (-6.1)	-143 (-6.7)	-134 (-6.2)	-139 (-6.5)
Jul	-	-1 (-0.1)	-4 (-0.4)	-4 (-0.5)	-2 (-0.3)	-4 (-0.5)	-4 (-0.4)	-3 (-0.3)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-11 (-2.3)	-13 (-2.8)	-12 (-2.7)	-11 (-2.4)	-12 (-2.7)	-11 (-2.5)	-12 (-2.6)

Table 41. Monthly Streamflow Dry Year (2004) – Roaring Fork River below Maroon Creek (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	87	87	87	87	87	87	87	87
Feb	78	78	78	78	78	78	78	78
Mar	98	98	98	98	98	98	98	98
Apr	146	146	146	146	146	146	146	146
May	464	464	464	464	464	464	464	464
Jun	700	700	700	700	700	700	700	700
Jul	348	348	348	348	348	348	348	348
Aug	161	161	161	161	161	161	161	161
Sep	136	136	136	136	136	136	136	136
Oct	146	146	146	146	146	146	146	146
Nov	121	121	121	121	121	121	121	121
Dec	103	103	103	103	103	103	103	103
Average	216	216	216	216	216	216	216	216
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [ac-ft (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 42. Simulated Annual Streamflow – Roaring Fork River below Maroon Creek (Cumulative Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	169,374	169,374	169,374	169,374	169,374	169,374	169,374	169,374
1991	Avg	201,797	201,797	201,797	201,797	201,797	201,797	201,797	201,797
1992	Avg	177,974	177,974	177,974	177,974	177,974	177,974	177,974	177,974
1993	Wet	279,702	274,546	274,546	274,546	274,546	274,546	274,546	274,546
1994	Avg	199,963	194,890	193,352	193,390	193,746	193,682	194,901	195,038
1995	Wet	447,448	436,120	436,242	436,850	436,892	436,155	436,751	436,674
1996	Wet	301,159	292,277	293,140	292,901	291,744	292,199	292,219	291,195
1997	Wet	328,719	321,097	319,639	319,867	320,750	319,936	320,526	320,251
1998	Avg	219,969	219,969	219,969	219,969	219,969	219,969	219,969	219,969
1999	Avg	252,039	248,701	247,395	247,587	246,419	247,794	248,482	247,737
2000	Dry	192,234	192,234	192,234	192,234	192,234	192,234	192,234	192,234
2001	Avg	181,360	180,457	180,457	180,457	180,457	180,457	180,457	180,457
2002	Dry	112,846	112,846	112,846	112,846	112,846	112,846	112,846	112,846
2003	Avg	177,726	177,726	177,726	177,726	177,726	177,726	177,726	177,726
2004	Dry	155,648	155,648	155,648	155,648	155,648	155,648	155,648	155,648
2005	Avg	191,919	191,919	191,919	191,919	191,919	191,919	191,919	191,919
2006	Avg	204,568	204,568	204,568	204,568	204,568	204,568	204,568	204,568
2007	Dry	213,424	208,228	208,737	208,653	208,457	208,522	208,254	208,525
2008	Wet	327,686	317,833	313,202	313,242	314,445	313,239	314,499	313,459
2009	Avg	265,565	251,355	251,351	251,351	251,364	251,351	251,321	251,351
Average		230,056	226,478	226,106	226,145	226,144	226,097	226,301	226,164
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	-1,538 (-0.8)	-1,500 (-0.8)	-1,144 (-0.6)	-1,208 (-0.6)	11 (0.0)	148 (0.1)
1995	Wet	-	-	122 (0.0)	731 (0.2)	772 (0.2)	35 (0.0)	631 (0.1)	554 (0.1)
1996	Wet	-	-	863 (0.3)	624 (0.2)	-534 (-0.2)	-78 (0.0)	-59 (0.0)	-1,082 (-0.4)
1997	Wet	-	-	-1,457 (-0.5)	-1,230 (-0.4)	-346 (-0.1)	-1,161 (-0.4)	-571 (-0.2)	-846 (-0.3)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	-1,306 (-0.5)	-1,115 (-0.4)	-2,282 (-0.9)	-907 (-0.4)	-220 (-0.1)	-965 (-0.4)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	509 (0.2)	425 (0.2)	229 (0.1)	294 (0.1)	26 (0.0)	297 (0.1)
2008	Wet	-	-	-4,631 (-1.5)	-4,591 (-1.4)	-3,389 (-1.1)	-4,594 (-1.4)	-3,334 (-1.0)	-4,374 (-1.4)
2009	Avg	-	-	-4 (0.0)	-4 (0.0)	8 (0.0)	-4 (0.0)	-35 (0.0)	-4 (0.0)
Average		-	-	-372 (-0.2)	-333 (-0.1)	-334 (-0.1)	-381 (-0.2)	-178 (-0.1)	-314 (-0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]									
1982	Wet	-	-	-	-	-	-	-	-
1983	Avg	-	-	-	-	-	-	-	-
1984	Wet	-	-	-	-	-	-	-	-
1985	Avg	-	-	-	-	-	-	-	-
1986	Wet	-	-	-	-	-	-	-	-
1987	Avg	-	-	-	-	-	-	-	-
1988	Dry	-	-	-	-	-	-	-	-
1989	Dry	-	-	-	-	-	-	-	-
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-5,156 (-1.8)	-5,156 (-1.8)	-5,156 (-1.8)	-5,156 (-1.8)	-5,156 (-1.8)	-5,156 (-1.8)	-5,156 (-1.8)
1994	Avg	-	-5,073 (-2.5)	-6,612 (-3.3)	-6,573 (-3.3)	-6,217 (-3.1)	-6,281 (-3.1)	-5,062 (-2.5)	-4,926 (-2.5)
1995	Wet	-	-11,328 (-2.5)	-11,207 (-2.5)	-10,598 (-2.4)	-10,556 (-2.4)	-11,293 (-2.5)	-10,697 (-2.4)	-10,774 (-2.4)
1996	Wet	-	-8,882 (-2.9)	-8,019 (-2.7)	-8,258 (-2.7)	-9,415 (-3.1)	-8,960 (-3.0)	-8,940 (-3.0)	-9,964 (-3.3)
1997	Wet	-	-7,623 (-2.3)	-9,080 (-2.8)	-8,853 (-2.7)	-7,969 (-2.4)	-8,784 (-2.7)	-8,193 (-2.5)	-8,469 (-2.6)
1998	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-3,338 (-1.3)	-4,644 (-1.8)	-4,453 (-1.8)	-5,620 (-2.2)	-4,245 (-1.7)	-3,557 (-1.4)	-4,303 (-1.7)
2000	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-903 (-0.5)	-903 (-0.5)	-903 (-0.5)	-903 (-0.5)	-903 (-0.5)	-903 (-0.5)	-903 (-0.5)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-5,196 (-2.4)	-4,687 (-2.2)	-4,771 (-2.2)	-4,967 (-2.3)	-4,902 (-2.3)	-5,171 (-2.4)	-4,899 (-2.3)
2008	Wet	-	-9,852 (-3.0)	-14,484 (-4.4)	-14,443 (-4.4)	-13,241 (-4.0)	-14,446 (-4.4)	-13,187 (-4.0)	-14,226 (-4.3)
2009	Avg	-	-14,210 -5.4)	-14,213 (-5.4)	-14,213 (-5.4)	-14,201 (-5.3)	-14,213 (-5.4)	-14,244 (-5.4)	-14,213 (-5.4)
Average		-	-3,578 (-1.6)	-3,950 (-1.7)	-3,911 (-1.7)	-3,912 (-1.7)	-3,959 (-1.7)	-3,756 (-1.6)	-3,892 (-1.7)

Note: Period-of-record for Roaring Fork below Maroon Creek near Aspen gage is November 1988 through present. Data shown for water years 1990-2009 only.

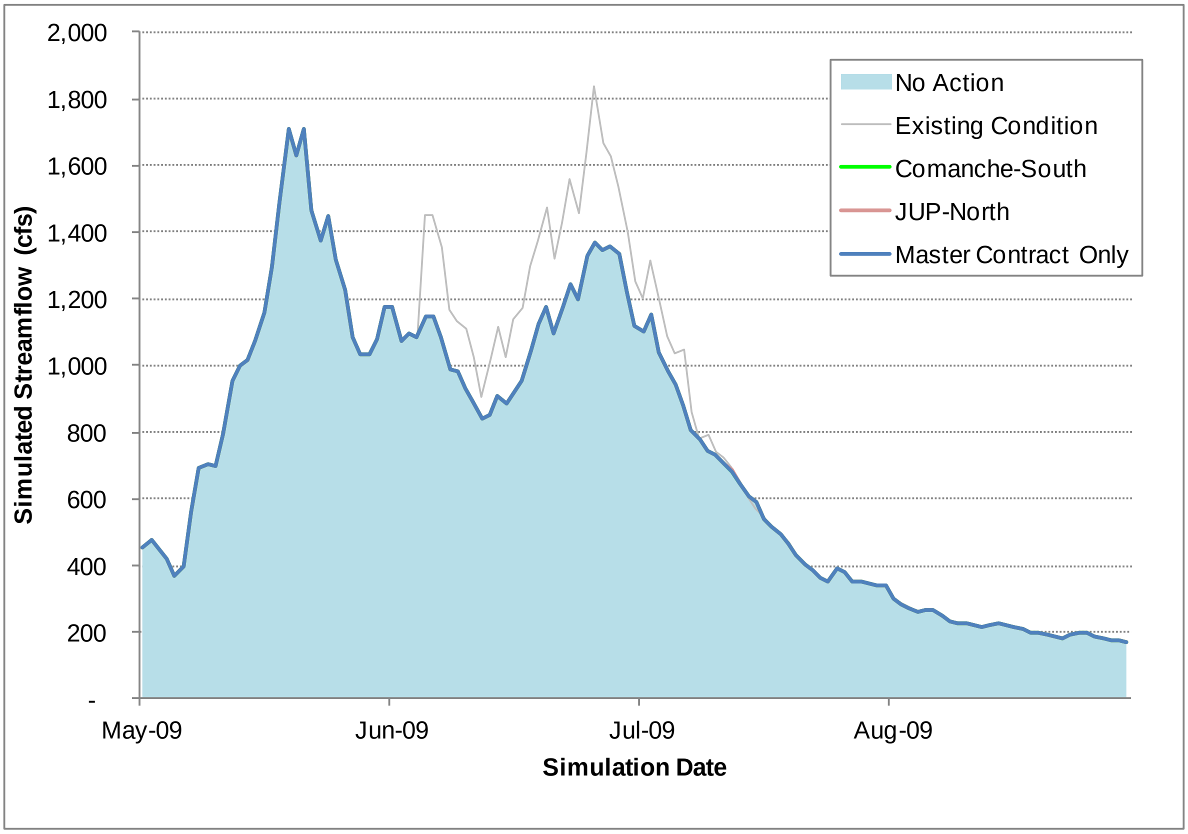


Figure 14. Simulated Daily Streamflow (2009 Runoff Season) - Roaring Fork River below Maroon Creek (Cumulative Effects)

Homestake Creek Basin

Streamflow and reservoir contents in the Homestake Creek basin are influenced by the Homestake Project collection system, storage and diversions to the east slope. The Homestake Project collection system diverts water from Homestake Creek and small tributaries into Homestake Reservoir. Most water stored in Homestake Reservoir is eventually conveyed to Turquoise Reservoir on the east slope as space is available. A portion of the water stored in Homestake Reservoir can be used to meet bypass flow requirements the Homestake Creek at Gold Park gage. Effects in the smaller tributaries of Homestake Creek would be a similar percentage as those for the Homestake at Gold Park gage; although the timing of the effects may be different due to influences of storage on Homestake Creek at Gold Park gage (effects in the tributaries would be limited to peak runoff months of June through July).

Although calculations were performed on a daily basis, no daily streamflow is shown for the Homestake Creek at Gold Park gage because the Daily Model was not calibrated to simulate daily releases from Homestake Reservoir. The timing of releases from Homestake Reservoir on a daily basis is made based upon several factors that were not coded into the model. Monthly and annual releases from Homestake Reservoir provide a reasonable description of anticipated effects.

Homestake Creek at Gold Park

Mean monthly direct effects for the Homestake Creek at Gold Park gage are negligible for all alternatives except the Joint Use Pipeline North Alternative in August, which shows a minor decrease in streamflow of approximately 1 cfs (Table 43). There are no monthly effects during typical normal and dry years (
Table 44 and Table 46), and negligible effects during the typical wet years (Table 45).

Annual streamflow range from no effects to minor effects (Table 47). Differences in simulated annual streamflow primarily occur during wet periods, and are primarily an effect of timing of storage and releases within Homestake Reservoir. Average annual streamflow effects are within 50 acre-feet for all alternatives.

Although the Homestake Project is not directly connected with AVC or the Master Contract, implementation of these projects has indirect “ripple” effects on operations of the Homestake Project. Simulated operations of the Homestake Project, and in particular conveyance through the Homestake Tunnel from Homestake Reservoir to Turquoise Reservoir, are a function of the amount of storage available in Turquoise Reservoir Homestake Project accounts. The amount of water in these accounts is a function of Aurora and Colorado Springs east slope operations, which are affected by the use of Fry-Ark storage for AVC and storage within the Master Contract. As with other transmountain diversion projects, differences in operations are most pronounced during wet periods when slight changes in storage availability on the East Slope affect the amount of water diverted from the West Slope.

Table 43. Mean Monthly Streamflow Overall Average– Homestake Creek at Gold Park (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	6	6	6	6	6	6	6	6
Feb	6	6	6	6	6	6	6	6
Mar	7	7	7	7	7	7	7	7
Apr	18	18	18	18	18	18	18	18
May	69	69	69	69	69	69	69	69
Jun	96	97	96	96	98	96	96	96
Jul	86	85	86	86	85	86	86	86
Aug	39	39	39	39	38	39	39	39
Sep	17	17	17	17	17	17	17	17
Oct	15	15	15	15	15	15	15	15
Nov	11	11	11	11	11	11	11	11
Dec	8	8	8	8	8	8	8	8
Average	31	31	31	31	31	31	31	31
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-1 (-0.5)	0 (-0.5)	2 (1.7)	-1 (-0.5)	0 (-0.4)	-1 (-1.0)
Jul	-	-	0 (0.6)	1 (0.6)	-1 (-0.7)	1 (0.6)	1 (0.6)	1 (1.4)
Aug	-	-	0 (-0.1)	0 (-0.1)	-1 (-2.2)	0 (0.0)	0 (0.3)	0 (0.4)
Sep	-	-	0 (0.1)	0 (0.1)	0 (0.9)	0 (0.1)	0 (0.1)	0 (0.1)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.4)	0 (-0.2)	0 (-0.1)	2 (2.0)	0 (-0.2)	0 (0.0)	-1 (-0.6)
Jul	-	-1 (-1.2)	-1 (-0.6)	-1 (-0.6)	-2 (-1.9)	-1 (-0.6)	-1 (-0.6)	0 (0.2)
Aug	-	0 (-0.7)	0 (-0.7)	0 (-0.8)	-1 (-2.9)	0 (-0.7)	0 (-0.4)	0 (-0.3)
Sep	-	0 (0.0)	0 (0.1)	0 (0.1)	0 (0.9)	0 (0.1)	0 (0.1)	0 (0.1)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (-0.3)	0 (-0.3)	0 (-0.3)	0 (-0.2)	0 (-0.3)	0 (-0.2)	0 (-0.2)

Table 44. Monthly Streamflow Normal Year (2005) – Homestake Creek at Gold Park (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	5	5	5	5	5	5	5	5
Mar	6	6	6	6	6	6	6	6
Apr	19	19	19	19	19	19	19	19
May	64	64	64	64	64	64	64	64
Jun	48	48	48	48	48	48	48	48
Jul	25	25	25	25	25	25	25	25
Aug	18	18	18	18	18	18	18	18
Sep	7	7	7	7	7	7	7	7
Oct	19	19	19	19	19	19	19	19
Nov	26	26	26	26	26	26	26	26
Dec	16	16	16	16	16	16	16	16
Average	22	22	22	22	22	22	22	22
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 45. Monthly Streamflow Wet Year (1997) – Homestake Creek at Gold Park (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	7	7	7	7	7	7	7	7
Mar	9	9	9	9	9	9	9	9
Apr	14	14	14	14	14	14	14	14
May	82	82	82	82	82	82	82	82
Jun	324	332	330	332	335	331	333	332
Jul	76	76	76	76	76	76	76	76
Aug	72	72	72	72	72	72	72	72
Sep	21	21	21	21	21	21	21	21
Oct	20	20	20	20	20	20	20	20
Nov	11	11	11	11	11	11	11	11
Dec	6	6	6	6	6	6	6	6
Average	54	55	55	55	55	55	55	55
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-1 (-0.4)	0 (0.1)	4 (1.1)	0 (-0.1)	2 (0.5)	0 (0.1)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (-0.2)	0 (-0.2)	0 (0.1)	0 (-0.2)	0 (-0.3)	0 (-0.2)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (-0.2)	0 (0.1)	0 (0.6)	0 (-0.1)	0 (0.2)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	7 (2.3)	6 (1.9)	8 (2.4)	11 (3.4)	7 (2.1)	9 (2.8)	8 (2.3)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.4)	0 (0.3)	0 (0.3)	0 (0.6)	0 (0.2)	0 (0.1)	0 (0.2)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	1 (1.2)	1 (1.0)	1 (1.2)	1 (1.7)	1 (1.1)	1 (1.4)	1 (1.2)

Table 46. Monthly Streamflow Dry Year (2004) – Homestake Creek at Gold Park (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	3	3	3	3	3	3	3	3
Feb	3	3	3	3	3	3	3	3
Mar	9	9	9	9	9	9	9	9
Apr	21	21	21	21	21	21	21	21
May	34	34	34	34	34	34	34	34
Jun	29	29	29	29	29	29	29	29
Jul	25	25	25	25	25	25	25	25
Aug	13	13	13	13	13	13	13	13
Sep	10	10	10	10	10	10	10	10
Oct	11	11	11	11	11	11	11	11
Nov	8	8	8	8	8	8	8	8
Dec	7	7	7	7	7	7	7	7
Average	15	15	15	15	15	15	15	15
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 47. Simulated Annual Streamflow – Homestake Creek at Gold Park (Direct Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	15,178	15,178	15,178	15,178	15,178	15,178	15,178	15,178
1983	Avg	27,012	25,340	25,780	25,907	23,175	25,781	26,052	27,080
1984	Wet	68,073	69,209	69,338	69,443	68,408	69,352	69,955	70,023
1985	Avg	22,484	22,411	22,234	22,175	25,075	22,464	21,719	21,230
1986	Wet	44,747	44,731	44,825	44,738	44,740	44,827	44,908	44,896
1987	Avg	16,469	16,469	16,469	16,469	16,469	16,469	16,469	16,469
1988	Dry	13,497	13,497	13,497	13,497	13,497	13,497	13,497	13,497
1989	Dry	14,010	14,010	14,010	14,010	14,010	14,010	14,010	14,010
1990	Dry	12,816	12,816	12,816	12,816	12,816	12,816	12,816	12,816
1991	Avg	16,442	16,442	16,442	16,442	16,442	16,442	16,442	16,442
1992	Avg	13,703	13,703	13,703	13,703	13,703	13,703	13,703	13,703
1993	Wet	22,835	22,835	22,835	22,835	22,835	22,835	22,835	22,835
1994	Avg	14,709	14,709	14,709	14,709	14,709	14,709	14,709	14,709
1995	Wet	51,753	51,281	51,450	51,419	50,809	51,462	51,632	51,640
1996	Wet	30,082	28,931	28,127	28,149	29,842	27,864	28,074	27,759
1997	Wet	38,622	39,077	38,999	39,098	39,302	39,042	39,168	39,081
1998	Avg	16,243	16,113	15,718	15,718	16,075	15,715	15,715	15,827
1999	Avg	23,434	23,492	23,941	23,867	23,651	23,945	23,724	23,753
2000	Dry	23,302	23,484	23,619	23,598	23,468	23,612	23,633	23,548
2001	Avg	14,010	14,010	14,010	14,010	14,010	14,010	14,010	14,010
2002	Dry	10,077	10,077	10,077	10,077	10,077	10,077	10,077	10,077
2003	Avg	16,752	16,752	16,752	16,752	16,752	16,752	16,752	16,752
2004	Dry	10,098	10,098	10,098	10,098	10,098	10,098	10,098	10,098
2005	Avg	13,816	13,816	13,816	13,816	13,816	13,816	13,816	13,816
2006	Avg	18,712	18,712	18,712	18,712	18,712	18,712	18,712	18,712
2007	Dry	18,312	18,312	18,312	18,312	18,312	18,312	18,312	18,312
2008	Wet	34,221	34,221	34,221	34,221	34,221	34,221	34,221	34,221
2009	Avg	20,205	20,205	20,205	20,205	20,205	20,205	20,205	20,205
Average		22,915	22,855	22,853	22,856	22,872	22,855	22,873	22,882
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	440 (1.7)	567 (2.2)	-2,166 (-8.5)	440 (1.7)	711 (2.8)	1,739 (6.9)
1984	Wet	-	-	129 (0.2)	234 (0.3)	-801 (-1.2)	143 (0.2)	746 (1.1)	814 (1.2)
1985	Avg	-	-	-177 (-0.8)	-236 (-1.1)	2,664 (11.9)	53 (0.2)	-692 (-3.1)	-1,181 (-5.3)
1986	Wet	-	-	94 (0.2)	7 (0.0)	9 (0.0)	95 (0.2)	177 (0.4)	165 (0.4)
1987	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-	170 (0.3)	139 (0.3)	-471 (-0.9)	182 (0.4)	352 (0.7)	360 (0.7)
1996	Wet	-	-	-804 (-2.8)	-782 (-2.7)	911 (3.1)	-1,067 (-3.7)	-857 (-3.0)	-1,172 (-4.1)
1997	Wet	-	-	-77 (-0.2)	21 (0.1)	225 (0.6)	-35 (-0.1)	91 (0.2)	4 (0.0)
1998	Avg	-	-	-395 (-2.5)	-395 (-2.5)	-38 (-0.2)	-398 (-2.5)	-398 (-2.5)	-286 (-1.8)
1999	Avg	-	-	450 (1.9)	376 (1.6)	160 (0.7)	453 (1.9)	233 (1.0)	261 (1.1)
2000	Dry	-	-	136 (0.6)	115 (0.5)	-16 (-0.1)	129 (0.5)	150 (0.6)	64 (0.3)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-	-1 (0.0)	2 (0.0)	17 (0.1)	0 (0.0)	18 (0.1)	27 (0.1)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-1,672 (-6.2)	-1,232 (-4.6)	-1,105 (-4.1)	-3,838 (-14.2)	-1,232 (-4.6)	-961 (-3.6)	67 (0.2)
1984	Wet	-	1,136 (1.7)	1,265 (1.9)	1,371 (2.0)	335 (0.5)	1,280 (1.9)	1,882 (2.8)	1,950 (2.9)
1985	Avg	-	-73 (-0.3)	-250 (-1.1)	-309 (-1.4)	2,592 (11.5)	-20 (-0.1)	-764 (-3.4)	-1,254 (-5.6)
1986	Wet	-	-16 (0.0)	78 (0.2)	-9 (0.0)	-7 (0.0)	79 (0.2)	161 (0.4)	149 (0.3)
1987	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-472 (-0.9)	-302 (-0.6)	-333 (-0.6)	-943 (-1.8)	-290 (-0.6)	-120 (-0.2)	-113 (-0.2)
1996	Wet	-	-1,151 (-3.8)	-1,955 (-6.5)	-1,934 (-6.4)	-241 (-0.8)	-2,218 (-7.4)	-2,009 (-6.7)	-2,323 (-7.7)
1997	Wet	-	454 (1.2)	377 (1.0)	476 (1.2)	679 (1.8)	419 (1.1)	546 (1.4)	458 (1.2)
1998	Avg	-	-130 (-0.8)	-525 (-3.2)	-525 (-3.2)	-168 (-1.0)	-528 (-3.2)	-528 (-3.3)	-416 (-2.6)
1999	Avg	-	58 (0.2)	507 (2.2)	433 (1.8)	217 (0.9)	511 (2.2)	290 (1.2)	319 (1.4)
2000	Dry	-	182 (0.8)	318 (1.4)	297 (1.3)	166 (0.7)	310 (1.3)	332 (1.4)	246 (1.1)
2001	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-60 (-0.3)	-61 (-0.3)	-59 (-0.3)	-43 (-0.2)	-60 (-0.3)	-42 (-0.2)	-33 (-0.1)

Mean monthly cumulative effects for the Homestake Creek at Gold Park gage are negligible for all alternatives (Table 48). There are no monthly effects during typical normal, wet or dry years (Table 49, Table 50 and Table 51). Simulated cumulative effects streamflow is less for all alternatives than existing conditions during the typical wet year due to increased diversions by the Homestake Project as a result of increased municipal demand.

Annual streamflow effects range from negligible to minor effects for all alternatives (Table 52). Simulated annual streamflow during dry and normal years is typically the same as existing conditions, while streamflow during wet years and occasionally during normal years that follow wet years, is lower than existing conditions. As with typical wet year effects, differences from existing conditions are a result of increased diversions by the Homestake Project to meet increased municipal demand on the East Slope in the cumulative effects analysis.

Table 48. Mean Monthly Streamflow Overall Average– Homestake Creek at Gold Park (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	6	6	6	6	6	6	6	6
Feb	6	6	6	6	6	6	6	6
Mar	7	7	7	7	7	7	7	7
Apr	18	18	18	18	18	18	18	18
May	69	69	69	69	69	69	69	69
Jun	96	83	83	83	83	83	83	83
Jul	86	62	62	62	62	62	62	65
Aug	39	33	33	34	33	33	34	33
Sep	17	17	17	17	17	17	17	17
Oct	15	15	15	15	15	15	15	15
Nov	11	11	11	11	11	11	11	11
Dec	8	8	8	8	8	8	8	8
Average	31	28	28	28	28	28	28	28
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.2)	0 (0.3)	0 (0.1)	0 (0.3)	0 (0.1)	0 (0.4)
Jul	-	-	0 (0.0)	0 (-0.2)	0 (0.4)	0 (-0.2)	0 (-0.4)	3 (4.1)
Aug	-	-	0 (-0.1)	0 (0.3)	0 (-0.5)	0 (-0.2)	1 (1.6)	0 (-1.0)
Sep	-	-	0 (0.1)	0 (0.1)	0 (0.0)	0 (0.1)	0 (0.2)	0 (0.1)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.8)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-13 (-13.9)	-13 (-13.7)	-13 (-13.6)	-13 (-13.8)	-13 (-13.6)	-13 (-13.8)	-13 (-13.5)
Jul	-	-24 (-27.9)	-24 (-27.9)	-24 (-28.0)	-24 (-27.6)	-24 (-28.0)	-24 (-28.2)	-21 (-24.9)
Aug	-	-6 (-15.3)	-6 (-15.3)	-6 (-15.0)	-6 (-15.7)	-6 (-15.4)	-5 (-13.9)	-6 (-16.1)
Sep	-	0 (0.6)	0 (0.7)	0 (0.7)	0 (0.6)	0 (0.7)	0 (0.8)	0 (0.7)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-4 (-11.6)	-4 (-11.5)	-4 (-11.5)	-4 (-11.5)	-4 (-11.5)	-4 (-11.5)	-3 (-10.9)

Table 49. Monthly Streamflow Normal Year (2005) – Homestake Creek at Gold Park (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	5	5	5	5	5	5	5	5
Mar	6	6	6	6	6	6	6	6
Apr	19	19	19	19	19	19	19	19
May	64	64	64	64	64	64	64	64
Jun	48	48	48	48	48	48	48	48
Jul	25	25	25	25	25	25	25	25
Aug	18	18	18	18	18	18	18	18
Sep	7	7	7	7	7	7	7	7
Oct	19	19	19	19	19	19	19	19
Nov	26	26	26	26	26	26	26	26
Dec	16	16	16	16	16	16	16	16
Average	22	22	22	22	22	22	22	22
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 50. Monthly Streamflow Wet Year (1997) – Homestake Creek at Gold Park (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	7	7	7	7	7	7	7	7
Feb	7	7	7	7	7	7	7	7
Mar	9	9	9	9	9	9	9	9
Apr	14	14	14	14	14	14	14	14
May	82	82	82	82	82	82	82	82
Jun	324	168	168	168	168	168	168	168
Jul	76	24	24	24	24	24	24	24
Aug	72	25	25	25	25	25	25	25
Sep	21	21	21	21	21	21	21	21
Oct	20	20	20	20	20	20	20	20
Nov	11	11	11	11	11	11	11	11
Dec	6	6	6	6	6	6	6	6
Average	54	33	33	33	33	33	33	33
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-157 (-48.3)	-157 (-48.3)	-157 (-48.3)	-157 (-48.3)	-157 (-48.3)	-157 (-48.3)	-157 (-48.3)
Jul	-	-52 (-68.4)	-52 (-68.4)	-52 (-68.4)	-52 (-68.4)	-52 (-68.4)	-52 (-68.4)	-52 (-68.4)
Aug	-	-47 (-65.7)	-47 (-65.7)	-47 (-65.7)	-47 (-65.7)	-47 (-65.7)	-47 (-65.7)	-47 (-65.7)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-21 (-39.4)	-21 (-39.4)	-21 (-39.4)	-21 (-39.4)	-21 (-39.4)	-21 (-39.4)	-21 (-39.4)

Table 51. Monthly Streamflow Dry Year (2004) – Homestake Creek at Gold Park (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	3	3	3	3	3	3	3	3
Feb	3	3	3	3	3	3	3	3
Mar	9	9	9	9	9	9	9	9
Apr	21	21	21	21	21	21	21	21
May	34	34	34	34	34	34	34	34
Jun	29	29	29	29	29	29	29	29
Jul	25	25	25	25	25	25	25	25
Aug	13	13	13	13	13	13	13	13
Sep	10	10	10	10	10	10	10	10
Oct	11	11	11	11	11	11	11	11
Nov	8	8	8	8	8	8	8	8
Dec	7	7	7	7	7	7	7	7
Average	15	15	15	15	15	15	15	15
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 52. Simulated Annual Streamflow – Homestake Creek at Gold Park (Cumulative Effects)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (ac-ft)									
1982	Wet	15,178	15,178	15,178	15,178	15,178	15,178	15,178	15,178
1983	Avg	27,012	21,481	21,229	21,281	21,153	21,195	21,587	21,465
1984	Wet	68,073	52,049	52,213	52,300	52,038	52,183	52,953	52,521
1985	Avg	22,484	15,801	15,582	15,449	16,175	15,587	15,214	15,577
1986	Wet	44,747	32,447	32,458	32,463	32,447	32,471	32,447	36,003
1987	Avg	16,469	16,469	16,469	16,469	16,469	16,469	16,469	16,469
1988	Dry	13,497	13,497	13,497	13,497	13,497	13,497	13,497	13,497
1989	Dry	14,010	14,010	14,010	14,010	14,010	14,010	14,010	14,010
1990	Dry	12,816	12,816	12,816	12,816	12,816	12,816	12,816	12,816
1991	Avg	16,442	16,442	16,442	16,442	16,442	16,442	16,442	16,442
1992	Avg	13,703	13,703	13,703	13,703	13,703	13,703	13,703	13,703
1993	Wet	22,835	22,835	22,835	22,835	22,835	22,835	22,835	22,835
1994	Avg	14,709	14,709	14,709	14,709	14,709	14,709	14,709	14,709
1995	Wet	51,753	48,485	48,801	48,859	48,567	48,651	48,687	48,661
1996	Wet	30,082	24,215	24,443	24,587	24,316	24,527	24,269	24,691
1997	Wet	38,622	23,226	23,226	23,226	23,226	23,226	23,226	23,226
1998	Avg	16,243	15,464	15,464	15,464	15,464	15,464	15,464	15,464
1999	Avg	23,434	17,290	17,290	17,290	17,290	17,290	17,290	17,290
2000	Dry	23,302	21,435	21,435	21,435	21,435	21,435	21,435	21,435
2001	Avg	14,010	14,010	14,010	14,010	14,010	14,010	14,010	14,010
2002	Dry	10,077	10,077	10,077	10,077	10,077	10,077	10,077	10,077
2003	Avg	16,752	16,752	16,752	16,752	16,752	16,752	16,752	16,752
2004	Dry	10,098	10,098	10,098	10,098	10,098	10,098	10,098	10,098
2005	Avg	13,816	13,816	13,816	13,816	13,816	13,816	13,816	13,816
2006	Avg	18,712	18,712	18,712	18,712	18,712	18,712	18,712	18,712
2007	Dry	18,312	18,312	18,312	18,312	18,312	18,312	18,312	18,312
2008	Wet	34,221	34,221	34,221	34,221	34,221	34,221	34,221	34,221
2009	Avg	20,205	20,205	20,205	20,205	20,205	20,205	20,205	20,205
Average		22,915	20,277	20,286	20,293	20,285	20,282	20,301	20,436
Change in Flow Compared to No Action [ac-ft (%)]									
1982	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-	-253 (-1.2)	-200 (-0.9)	-328 (-1.5)	-286 (-1.3)	106 (0.5)	-16 (-0.1)
1984	Wet	-	-	165 (0.3)	251 (0.5)	-11 (0.0)	134 (0.3)	904 (1.7)	472 (0.9)
1985	Avg	-	-	-219 (-1.4)	-352 (-2.2)	373 (2.4)	-214 (-1.4)	-587 (-3.7)	-224 (-1.4)
1986	Wet	-	-	11 (0.0)	15 (0.0)	0 (0.0)	24 (0.1)	0 (0.0)	3,556 (11.0)
1987	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1988	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-	317 (0.7)	375 (0.8)	83 (0.2)	167 (0.3)	203 (0.4)	176 (0.4)
1996	Wet	-	-	229 (0.9)	372 (1.5)	101 (0.4)	313 (1.3)	55 (0.2)	477 (2.0)
1997	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1998	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1999	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2000	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2001	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Water Year	East Slope Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
2004	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-	9 (0.0)	16 (0.1)	8 (0.0)	5 (0.0)	24 (0.1)	159 (0.8)
Change in Flow Compared to Existing Conditions [ac-ft (%)]									
1982	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1983	Avg	-	-5,531 (-20.5)	-5,784 (-21.4)	-5,731 (-21.2)	-5,859 (-21.7)	-5,817 (-21.5)	-5,426 (-20.1)	-5,548 (-20.5)
1984	Wet	-	-16,024 (-23.5)	-15,859 (-23.3)	-15,773 (-23.2)	-16,035 (-23.6)	-15,890 (-23.3)	-15,120 (-22.2)	-15,552 (-22.8)
1985	Avg	-	-6,683 (-29.7)	-6,901 (-30.7)	-7,035 (-31.3)	-6,309 (-28.1)	-6,897 (-30.7)	-7,270 (-32.3)	-6,907 (-30.7)
1986	Wet	-	-12,300 (-27.5)	-12,289 (-27.5)	-12,284 (-27.5)	-12,300 (-27.5)	-12,276 (-27.4)	-12,300 (-27.5)	-8,744 (-19.5)
1987	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1988	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1989	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1991	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1992	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1993	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1994	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1995	Wet	-	-3,268 (-6.3)	-2,951 (-5.7)	-2,893 (-5.6)	-3,185 (-6.2)	-3,101 (-6.0)	-3,065 (-5.9)	-3,092 (-6.0)
1996	Wet	-	-5,868 (-19.5)	-5,639 (-18.7)	-5,495 (-18.3)	-5,766 (-19.2)	-5,555 (-18.5)	-5,813 (-19.3)	-5,391 (-17.9)
1997	Wet	-	-15,397 (-39.9)	-15,397 (-39.9)	-15,397 (-39.9)	-15,397 (-39.9)	-15,397 (-39.9)	-15,397 (-39.9)	-15,397 (-39.9)
1998	Avg	-	-779 (-4.8)	-779 (-4.8)	-779 (-4.8)	-779 (-4.8)	-779 (-4.8)	-779 (-4.8)	-779 (-4.8)
1999	Avg	-	-6,144 (-26.2)	-6,144 (-26.2)	-6,144 (-26.2)	-6,144 (-26.2)	-6,144 (-26.2)	-6,144 (-26.2)	-6,144 (-26.2)
2000	Dry	-	-1,867 (-8.0)	-1,867 (-8.0)	-1,867 (-8.0)	-1,867 (-8.0)	-1,867 (-8.0)	-1,867 (-8.0)	-1,867 (-8.0)
2001	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2002	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2003	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2004	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2005	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2006	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2007	Dry	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2008	Wet	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
2009	Avg	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average		-	-2,638 (-11.5)	-2,629 (-11.5)	-2,621 (-11.4)	-2,630 (-11.5)	-2,633 (-11.5)	-2,614 (-11.4)	-2,479 (-10.8)

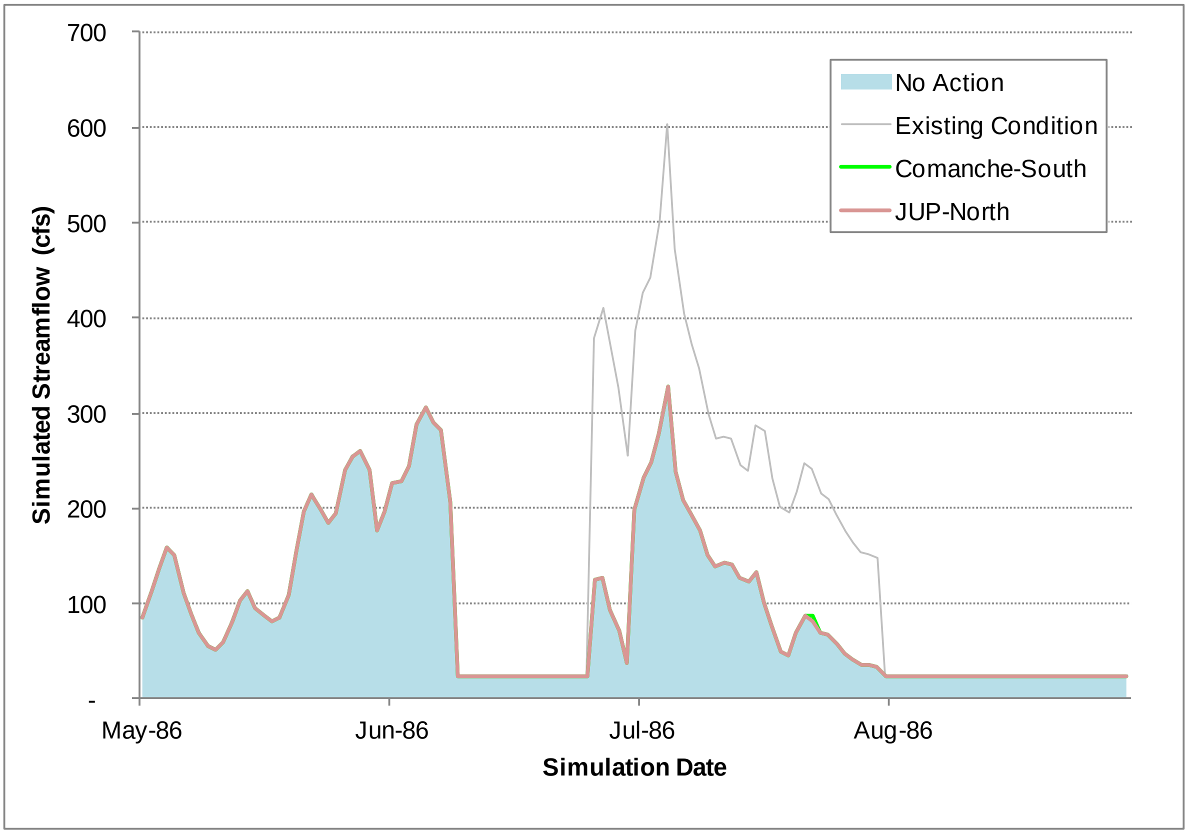


Figure 15. **Simulated Daily Streamflow (1986 Runoff Season) - Homestake Creek at Gold Park (Cumulative Effects)**

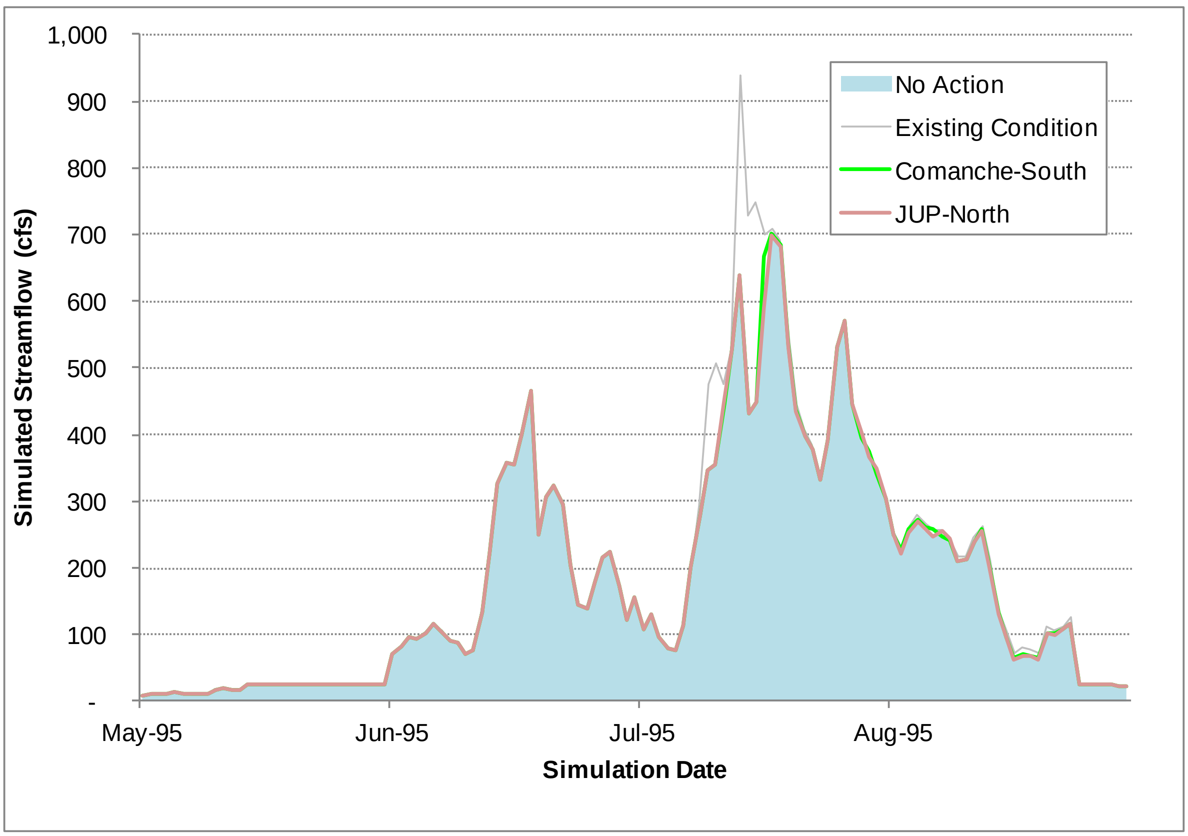


Figure 16. **Simulated Daily Streamflow (1995 Runoff Season) - Homestake Creek at Gold Park (Cumulative Effects)**

Homestake Reservoir

Mean monthly direct effects for Homestake Reservoir are negligible for all alternatives (Table 53). There are also negligible effects during typical normal, wet and dry years (
Table 54,
Table 55, and
Table 56, respectively). Figure 16 shows that in the direct effects analysis, differences in simulated storage within Homestake Reservoir are limited to a few years, and are a result of slight changes in the timing of diversions and releases from the Reservoir.

Mean monthly cumulative effects on storage in Homestake Reservoir are negligible for all alternatives (

Table 57). Monthly cumulative effects are negligible for typical wet year (
Table 59) and negligible to minor for typical normal years and dry years (Table 58 and
Table 60). Compared to existing conditions, storage is generally less for all alternatives (Figure 18). Changes in storage for both the direct and cumulative effects are due to the same reasons as those described for the Homestake Creek at Gold Park gage.

Table 53. Mean Monthly Storage Overall Average– Homestake Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	28,800	28,700	28,700	28,700	28,800	28,700	28,700	28,700
Feb	28,800	28,800	28,700	28,700	28,800	28,800	28,700	28,700
Mar	24,400	24,300	24,300	24,200	24,400	24,300	24,300	24,200
Apr	20,500	20,400	20,400	20,400	20,500	20,400	20,400	20,300
May	20,100	19,900	19,900	19,900	20,100	19,900	19,900	19,800
Jun	30,100	30,000	30,000	30,000	30,100	30,000	30,000	30,000
Jul	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000
Aug	35,900	35,900	35,900	35,900	35,900	35,900	35,900	35,900
Sep	34,800	34,800	34,800	34,800	34,800	34,800	34,800	34,800
Oct	30,600	30,500	30,500	30,500	30,600	30,600	30,500	30,500
Nov	28,800	28,700	28,700	28,700	28,800	28,700	28,700	28,700
Dec	28,800	28,700	28,700	28,700	28,800	28,700	28,700	28,700
Average	29,100	29,000	29,000	29,000	29,000	29,000	29,000	29,000
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	-100 (-0.3)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Mar	-	-	0 (0.0)	-100 (-0.4)	100 (0.4)	0 (0.0)	0 (0.0)	-100 (-0.4)
Apr	-	-	0 (0.0)	0 (0.0)	100 (0.5)	0 (0.0)	0 (0.0)	-100 (-0.5)
May	-	-	0 (0.0)	0 (0.0)	200 (1.0)	0 (0.0)	0 (0.0)	-100 (-0.5)
Jun	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	100 (0.3)	100 (0.3)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Feb	-	0 (0.0)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Mar	-	-100 (-0.4)	-100 (-0.4)	-200 (-0.8)	0 (0.0)	-100 (-0.4)	-100 (-0.4)	-200 (-0.8)
Apr	-	-100 (-0.5)	-100 (-0.5)	-100 (-0.5)	0 (0.0)	-100 (-0.5)	-100 (-0.5)	-200 (-1.0)
May	-	-200 (-1.0)	-200 (-1.0)	-200 (-1.0)	0 (0.0)	-200 (-1.0)	-200 (-1.0)	-300 (-1.5)
Jun	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Nov	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Dec	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Average	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)

Table 54. Mean Monthly Storage Normal Year (2005) – Homestake Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	10,900	10,800	10,800	10,800	10,800	10,800	10,800	10,800
Feb	11,100	10,900	10,900	10,900	10,900	10,900	10,900	10,900
Mar	11,200	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Apr	11,200	11,000	11,000	11,000	11,000	11,000	11,000	11,000
May	14,400	14,300	14,300	14,300	14,300	14,300	14,300	14,300
Jun	27,400	27,400	27,400	27,400	27,400	27,400	27,400	27,400
Jul	32,900	32,900	32,900	32,900	32,900	32,900	32,900	32,900
Aug	29,900	29,800	29,800	29,800	29,900	29,800	29,800	29,800
Sep	29,200	29,100	29,100	29,100	29,100	29,100	29,100	29,100
Oct	23,000	24,200	24,100	24,200	24,200	24,200	24,200	24,000
Nov	20,100	21,400	21,300	21,400	21,500	21,400	21,400	21,200
Dec	20,100	21,400	21,300	21,400	21,500	21,400	21,400	21,200
Average	20,200	20,400	20,400	20,400	20,400	20,400	20,400	20,400
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	-100 (-0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-200 (-0.8)
Nov	-	-	-100 (-0.5)	0 (0.0)	100 (0.5)	0 (0.0)	0 (0.0)	-200 (-0.9)
Dec	-	-	-100 (-0.5)	0 (0.0)	100 (0.5)	0 (0.0)	0 (0.0)	-200 (-0.9)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)
Feb	-	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)
Mar	-	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)
Apr	-	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)	-200 (-1.8)
May	-	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)
Jun	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Sep	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Oct	-	1,200 (5.2)	1,100 (4.8)	1,200 (5.2)	1,200 (5.2)	1,200 (5.2)	1,200 (5.2)	1,000 (4.3)
Nov	-	1,300 (6.5)	1,200 (6.0)	1,300 (6.5)	1,400 (7.0)	1,300 (6.5)	1,300 (6.5)	1,100 (5.5)
Dec	-	1,300 (6.5)	1,200 (6.0)	1,300 (6.5)	1,400 (7.0)	1,300 (6.5)	1,300 (6.5)	1,100 (5.5)
Average	-	200 (1.0)	200 (1.0)	200 (1.0)	200 (1.0)	200 (1.0)	200 (1.0)	200 (1.0)

Table 55. Mean Monthly Storage Wet Year (1997) – Homestake Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	39,800	39,700	39,700	39,700	39,700	39,700	39,700	39,700
Feb	39,800	39,700	39,700	39,700	39,700	39,700	39,700	39,700
Mar	32,600	32,700	32,700	32,800	32,900	32,700	32,800	32,700
Apr	25,600	25,900	25,800	25,900	26,100	25,900	26,100	25,900
May	25,300	25,600	25,500	25,700	25,900	25,600	25,700	25,600
Jun	41,500	41,700	41,600	41,600	41,700	41,600	41,700	41,600
Jul	43,600	43,600	43,600	43,600	43,600	43,600	43,600	43,600
Aug	43,600	43,600	43,600	43,600	43,600	43,600	43,600	43,600
Sep	43,300	43,300	43,300	43,300	43,300	43,300	43,300	43,300
Oct	41,200	41,200	41,200	41,200	41,200	41,200	41,200	41,200
Nov	39,800	39,800	39,800	39,800	39,800	39,800	39,800	39,800
Dec	39,700	39,700	39,700	39,700	39,700	39,700	39,700	39,700
Average	38,000	38,000	38,000	38,000	38,100	38,000	38,100	38,000
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	100 (0.3)	200 (0.6)	0 (0.0)	100 (0.3)	0 (0.0)
Apr	-	-	-100 (-0.4)	0 (0.0)	200 (0.8)	0 (0.0)	200 (0.8)	0 (0.0)
May	-	-	-100 (-0.4)	100 (0.4)	300 (1.2)	0 (0.0)	100 (0.4)	0 (0.0)
Jun	-	-	-100 (-0.2)	-100 (-0.2)	0 (0.0)	-100 (-0.2)	0 (0.0)	-100 (-0.2)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	100 (0.3)	0 (0.0)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Feb	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Mar	-	100 (0.3)	100 (0.3)	200 (0.6)	300 (0.9)	100 (0.3)	200 (0.6)	100 (0.3)
Apr	-	300 (1.2)	200 (0.8)	300 (1.2)	500 (2.0)	300 (1.2)	500 (2.0)	300 (1.2)
May	-	300 (1.2)	200 (0.8)	400 (1.6)	600 (2.4)	300 (1.2)	400 (1.6)	300 (1.2)
Jun	-	200 (0.5)	100 (0.2)	100 (0.2)	200 (0.5)	100 (0.2)	200 (0.5)	100 (0.2)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.3)	0 (0.0)	100 (0.3)	0 (0.0)

Table 56. Mean Monthly Storage Dry Year (2004) – Homestake Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	17,200	17,100	17,100	17,100	17,100	17,100	17,100	17,100
Feb	17,300	17,100	17,100	17,100	17,100	17,100	17,100	17,100
Mar	17,400	17,200	17,200	17,200	17,200	17,200	17,200	17,200
Apr	17,500	17,400	17,400	17,400	17,400	17,400	17,400	17,400
May	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900
Jun	27,800	27,900	27,900	27,900	27,900	27,900	27,900	27,900
Jul	32,400	32,400	32,400	32,400	32,400	32,400	32,400	32,400
Aug	27,200	27,500	27,500	27,500	27,500	27,500	27,500	27,500
Sep	23,300	23,200	23,200	23,200	23,200	23,200	23,200	23,200
Oct	14,900	14,700	14,700	14,700	14,700	14,700	14,700	14,700
Nov	10,800	10,600	10,600	10,600	10,600	10,600	10,600	10,600
Dec	10,900	10,800	10,800	10,800	10,800	10,800	10,800	10,800
Average	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)
Feb	-	-200 (-1.2)	-200 (-1.2)	-200 (-1.2)	-200 (-1.2)	-200 (-1.2)	-200 (-1.2)	-200 (-1.2)
Mar	-	-200 (-1.1)	-200 (-1.1)	-200 (-1.1)	-200 (-1.1)	-200 (-1.1)	-200 (-1.1)	-200 (-1.1)
Apr	-	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)	-100 (-0.6)
May	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	100 (0.4)	100 (0.4)	100 (0.4)	100 (0.4)	100 (0.4)	100 (0.4)	100 (0.4)
Jul	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	300 (1.1)	300 (1.1)	300 (1.1)	300 (1.1)	300 (1.1)	300 (1.1)	300 (1.1)
Sep	-	-100 (-0.4)	-100 (-0.4)	-100 (-0.4)	-100 (-0.4)	-100 (-0.4)	-100 (-0.4)	-100 (-0.4)
Oct	-	-200 (-1.3)	-200 (-1.3)	-200 (-1.3)	-200 (-1.3)	-200 (-1.3)	-200 (-1.3)	-200 (-1.3)
Nov	-	-200 (-1.9)	-200 (-1.9)	-200 (-1.9)	-200 (-1.9)	-200 (-1.9)	-200 (-1.9)	-200 (-1.9)
Dec	-	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)	-100 (-0.9)
Average	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

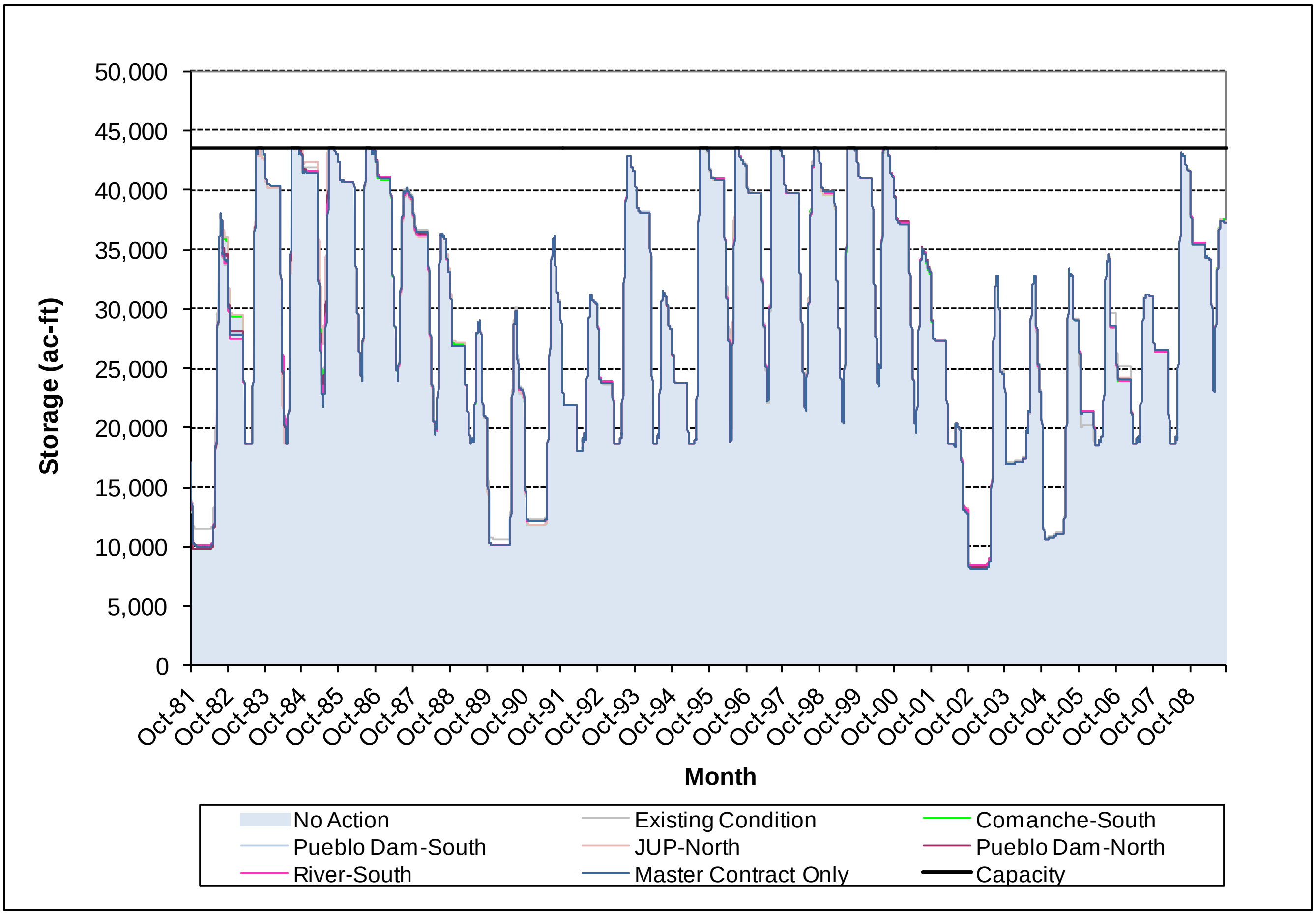


Figure 17. Simulated Time-Series Storage - Homestake Reservoir (Direct Effects)

Table 57. Mean Monthly Storage Overall Average– Homestake Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	28,800	24,900	24,900	24,800	24,700	24,900	24,700	24,700
Feb	28,800	24,900	24,900	24,800	24,700	24,900	24,700	24,700
Mar	24,400	20,100	20,200	20,100	20,000	20,200	20,000	20,000
Apr	20,500	16,800	17,000	16,900	16,800	17,000	16,800	16,800
May	20,100	17,400	17,500	17,400	17,300	17,500	17,400	17,400
Jun	30,100	26,700	26,700	26,700	26,700	26,700	26,700	26,700
Jul	37,000	34,900	34,800	34,900	34,900	34,800	34,900	34,900
Aug	35,900	33,600	33,600	33,500	33,600	33,600	33,500	33,600
Sep	34,800	31,800	31,600	31,500	31,700	31,600	31,600	31,600
Oct	30,600	26,500	26,500	26,400	26,300	26,500	26,400	26,400
Nov	28,800	24,900	24,900	24,800	24,700	24,900	24,700	24,700
Dec	28,800	24,900	24,900	24,800	24,600	24,900	24,700	24,700
Average	29,100	25,600	25,600	25,600	25,500	25,600	25,500	25,500
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	-100 (-0.4)	-200 (-0.8)	0 (0.0)	-200 (-0.8)	-200 (-0.8)
Feb	-	-	0 (0.0)	-100 (-0.4)	-200 (-0.8)	0 (0.0)	-200 (-0.8)	-200 (-0.8)
Mar	-	-	100 (0.5)	0 (0.0)	-100 (-0.5)	100 (0.5)	-100 (-0.5)	-100 (-0.5)
Apr	-	-	200 (1.2)	100 (0.6)	0 (0.0)	200 (1.2)	0 (0.0)	0 (0.0)
May	-	-	100 (0.6)	0 (0.0)	-100 (-0.6)	100 (0.6)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	-100 (-0.3)	0 (0.0)	0 (0.0)	-100 (-0.3)	0 (0.0)
Sep	-	-	-200 (-0.6)	-300 (-0.9)	-100 (-0.3)	-200 (-0.6)	-200 (-0.6)	-200 (-0.6)
Oct	-	-	0 (0.0)	-100 (-0.4)	-200 (-0.8)	0 (0.0)	-100 (-0.4)	-100 (-0.4)
Nov	-	-	0 (0.0)	-100 (-0.4)	-200 (-0.8)	0 (0.0)	-200 (-0.8)	-200 (-0.8)
Dec	-	-	0 (0.0)	-100 (-0.4)	-300 (-1.2)	0 (0.0)	-200 (-0.8)	-200 (-0.8)
Average	-	-	0 (0.0)	0 (0.0)	-100 (-0.4)	0 (0.0)	-100 (-0.4)	-100 (-0.4)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-3,900 (-13.5)	-3,900 (-13.5)	-4,000 (-13.9)	-4,100 (-14.2)	-3,900 (-13.5)	-4,100 (-14.2)	-4,100 (-14.2)
Feb	-	-3,900 (-13.5)	-3,900 (-13.5)	-4,000 (-13.9)	-4,100 (-14.2)	-3,900 (-13.5)	-4,100 (-14.2)	-4,100 (-14.2)
Mar	-	-4,300 (-17.6)	-4,200 (-17.2)	-4,300 (-17.6)	-4,400 (-18.0)	-4,200 (-17.2)	-4,400 (-18.0)	-4,400 (-18.0)
Apr	-	-3,700 (-18.0)	-3,500 (-17.1)	-3,600 (-17.6)	-3,700 (-18.0)	-3,500 (-17.1)	-3,700 (-18.0)	-3,700 (-18.0)
May	-	-2,700 (-13.4)	-2,600 (-12.9)	-2,700 (-13.4)	-2,800 (-13.9)	-2,600 (-12.9)	-2,700 (-13.4)	-2,700 (-13.4)
Jun	-	-3,400 (-11.3)	-3,400 (-11.3)	-3,400 (-11.3)	-3,400 (-11.3)	-3,400 (-11.3)	-3,400 (-11.3)	-3,400 (-11.3)
Jul	-	-2,100 (-5.7)	-2,200 (-5.9)	-2,100 (-5.7)	-2,100 (-5.7)	-2,200 (-5.9)	-2,100 (-5.7)	-2,100 (-5.7)
Aug	-	-2,300 (-6.4)	-2,300 (-6.4)	-2,400 (-6.7)	-2,300 (-6.4)	-2,300 (-6.4)	-2,400 (-6.7)	-2,300 (-6.4)
Sep	-	-3,000 (-8.6)	-3,200 (-9.2)	-3,300 (-9.5)	-3,100 (-8.9)	-3,200 (-9.2)	-3,200 (-9.2)	-3,200 (-9.2)
Oct	-	-4,100 (-13.4)	-4,100 (-13.4)	-4,200 (-13.7)	-4,300 (-14.1)	-4,100 (-13.4)	-4,200 (-13.7)	-4,200 (-13.7)
Nov	-	-3,900 (-13.5)	-3,900 (-13.5)	-4,000 (-13.9)	-4,100 (-14.2)	-3,900 (-13.5)	-4,100 (-14.2)	-4,100 (-14.2)
Dec	-	-3,900 (-13.5)	-3,900 (-13.5)	-4,000 (-13.9)	-4,200 (-14.6)	-3,900 (-13.5)	-4,100 (-14.2)	-4,100 (-14.2)
Average	-	-3,500 (-12.0)	-3,500 (-12.0)	-3,500 (-12.0)	-3,600 (-12.4)	-3,500 (-12.0)	-3,600 (-12.4)	-3,600 (-12.4)

Table 58. Mean Monthly Storage Normal Year (2005) – Homestake Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	10,900	12,000	12,100	12,100	11,600	12,100	12,100	12,100
Feb	11,100	12,100	12,300	12,300	11,700	12,300	12,300	12,200
Mar	11,200	12,300	12,400	12,400	11,800	12,400	12,400	12,400
Apr	11,200	12,300	12,400	12,400	11,800	12,400	12,400	12,400
May	14,400	15,400	15,500	15,500	15,000	15,500	15,500	15,500
Jun	27,400	28,000	28,000	28,000	27,700	28,000	28,100	28,000
Jul	32,900	37,000	37,000	37,000	36,700	37,000	37,100	37,100
Aug	29,900	33,600	34,200	34,500	33,800	34,500	33,400	33,700
Sep	29,200	29,200	29,300	29,500	29,500	29,600	29,000	29,200
Oct	23,000	22,100	22,100	22,300	22,100	22,400	21,500	21,900
Nov	20,100	19,800	19,900	20,200	19,700	20,300	19,100	19,600
Dec	20,100	19,800	19,900	20,200	19,700	20,300	19,100	19,600
Average	20,200	21,200	21,300	21,400	21,000	21,500	21,100	21,200
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	100 (0.8)	100 (0.8)	-400 (-3.3)	100 (0.8)	100 (0.8)	100 (0.8)
Feb	-	-	200 (1.7)	200 (1.7)	-400 (-3.3)	200 (1.7)	200 (1.7)	100 (0.8)
Mar	-	-	100 (0.8)	100 (0.8)	-500 (-4.1)	100 (0.8)	100 (0.8)	100 (0.8)
Apr	-	-	100 (0.8)	100 (0.8)	-500 (-4.1)	100 (0.8)	100 (0.8)	100 (0.8)
May	-	-	100 (0.6)	100 (0.6)	-400 (-2.6)	100 (0.6)	100 (0.6)	100 (0.6)
Jun	-	-	0 (0.0)	0 (0.0)	-300 (-1.1)	0 (0.0)	100 (0.4)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	-300 (-0.8)	0 (0.0)	100 (0.3)	100 (0.3)
Aug	-	-	600 (1.8)	900 (2.7)	200 (0.6)	900 (2.7)	-200 (-0.6)	100 (0.3)
Sep	-	-	100 (0.3)	300 (1.0)	300 (1.0)	400 (1.4)	-200 (-0.7)	0 (0.0)
Oct	-	-	0 (0.0)	200 (0.9)	0 (0.0)	300 (1.4)	-600 (-2.7)	-200 (-0.9)
Nov	-	-	100 (0.5)	400 (2.0)	-100 (-0.5)	500 (2.5)	-700 (-3.5)	-200 (-1.0)
Dec	-	-	100 (0.5)	400 (2.0)	-100 (-0.5)	500 (2.5)	-700 (-3.5)	-200 (-1.0)
Average	-	-	100 (0.5)	200 (0.9)	-200 (-0.9)	300 (1.4)	-100 (-0.5)	0 (0.0)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	1,100 (10.1)	1,200 (11.0)	1,200 (11.0)	700 (6.4)	1,200 (11.0)	1,200 (11.0)	1,200 (11.0)
Feb	-	1,000 (9.0)	1,200 (10.8)	1,200 (10.8)	600 (5.4)	1,200 (10.8)	1,200 (10.8)	1,100 (9.9)
Mar	-	1,100 (9.8)	1,200 (10.7)	1,200 (10.7)	600 (5.4)	1,200 (10.7)	1,200 (10.7)	1,200 (10.7)
Apr	-	1,100 (9.8)	1,200 (10.7)	1,200 (10.7)	600 (5.4)	1,200 (10.7)	1,200 (10.7)	1,200 (10.7)
May	-	1,000 (6.9)	1,100 (7.6)	1,100 (7.6)	600 (4.2)	1,100 (7.6)	1,100 (7.6)	1,100 (7.6)
Jun	-	600 (2.2)	600 (2.2)	600 (2.2)	300 (1.1)	600 (2.2)	700 (2.6)	600 (2.2)
Jul	-	4,100 (12.5)	4,100 (12.5)	4,100 (12.5)	3,800 (11.6)	4,100 (12.5)	4,200 (12.8)	4,200 (12.8)
Aug	-	3,700 (12.4)	4,300 (14.4)	4,600 (15.4)	3,900 (13.0)	4,600 (15.4)	3,500 (11.7)	3,800 (12.7)
Sep	-	0 (0.0)	100 (0.3)	300 (1.0)	300 (1.0)	400 (1.4)	-200 (-0.7)	0 (0.0)
Oct	-	-900 (-3.9)	-900 (-3.9)	-700 (-3.0)	-900 (-3.9)	-600 (-2.6)	-1,500 (-6.5)	-1,100 (-4.8)
Nov	-	-300 (-1.5)	-200 (-1.0)	100 (0.5)	-400 (-2.0)	200 (1.0)	-1,000 (-5.0)	-500 (-2.5)
Dec	-	-300 (-1.5)	-200 (-1.0)	100 (0.5)	-400 (-2.0)	200 (1.0)	-1,000 (-5.0)	-500 (-2.5)
Average	-	1,000 (5.0)	1,100 (5.4)	1,200 (5.9)	800 (4.0)	1,300 (6.4)	900 (4.5)	1,000 (5.0)

Table 59. Mean Monthly Storage Wet Year (1997) – Homestake Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	39,800	34,100	34,100	33,800	34,600	33,800	33,700	33,800
Feb	39,800	34,100	34,100	33,800	34,600	33,800	33,700	33,800
Mar	32,600	25,200	25,200	25,000	25,500	25,000	25,000	25,000
Apr	25,600	18,700	18,700	18,700	18,700	18,700	18,700	18,700
May	25,300	19,300	19,300	19,300	19,300	19,300	19,300	19,300
Jun	41,500	31,800	31,700	31,700	31,700	31,700	31,700	31,700
Jul	43,600	42,600	42,500	42,300	42,500	42,300	42,500	42,500
Aug	43,600	42,900	42,900	42,900	42,900	42,900	42,900	42,900
Sep	43,300	42,100	42,100	42,100	42,100	42,100	42,100	42,100
Oct	41,200	38,800	38,800	38,800	38,800	38,800	38,700	38,800
Nov	39,800	37,300	37,400	37,300	37,300	37,400	37,200	37,200
Dec	39,700	37,300	37,400	37,300	37,200	37,300	37,200	37,200
Average	38,000	33,700	33,700	33,600	33,800	33,600	33,600	33,600
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	-300 (-0.9)	500 (1.5)	-300 (-0.9)	-400 (-1.2)	-300 (-0.9)
Feb	-	-	0 (0.0)	-300 (-0.9)	500 (1.5)	-300 (-0.9)	-400 (-1.2)	-300 (-0.9)
Mar	-	-	0 (0.0)	-200 (-0.8)	300 (1.2)	-200 (-0.8)	-200 (-0.8)	-200 (-0.8)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Jul	-	-	-100 (-0.2)	-300 (-0.7)	-100 (-0.2)	-300 (-0.7)	-100 (-0.2)	-100 (-0.2)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-100 (-0.3)	0 (0.0)
Nov	-	-	100 (0.3)	0 (0.0)	0 (0.0)	100 (0.3)	-100 (-0.3)	-100 (-0.3)
Dec	-	-	100 (0.3)	0 (0.0)	-100 (-0.3)	0 (0.0)	-100 (-0.3)	-100 (-0.3)
Average	-	-	0 (0.0)	-100 (-0.3)	100 (0.3)	-100 (-0.3)	-100 (-0.3)	-100 (-0.3)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-5,700 (-14.3)	-5,700 (-14.3)	-6,000 (-15.1)	-5,200 (-13.1)	-6,000 (-15.1)	-6,100 (-15.3)	-6,000 (-15.1)
Feb	-	-5,700 (-14.3)	-5,700 (-14.3)	-6,000 (-15.1)	-5,200 (-13.1)	-6,000 (-15.1)	-6,100 (-15.3)	-6,000 (-15.1)
Mar	-	-7,400 (-22.7)	-7,400 (-22.7)	-7,600 (-23.3)	-7,100 (-21.8)	-7,600 (-23.3)	-7,600 (-23.3)	-7,600 (-23.3)
Apr	-	-6,900 (-27.0)	-6,900 (-27.0)	-6,900 (-27.0)	-6,900 (-27.0)	-6,900 (-27.0)	-6,900 (-27.0)	-6,900 (-27.0)
May	-	-6,000 (-23.7)	-6,000 (-23.7)	-6,000 (-23.7)	-6,000 (-23.7)	-6,000 (-23.7)	-6,000 (-23.7)	-6,000 (-23.7)
Jun	-	-9,700 (-23.4)	-9,800 (-23.6)	-9,800 (-23.6)	-9,800 (-23.6)	-9,800 (-23.6)	-9,800 (-23.6)	-9,800 (-23.6)
Jul	-	-1,000 (-2.3)	-1,100 (-2.5)	-1,300 (-3.0)	-1,100 (-2.5)	-1,300 (-3.0)	-1,100 (-2.5)	-1,100 (-2.5)
Aug	-	-700 (-1.6)	-700 (-1.6)	-700 (-1.6)	-700 (-1.6)	-700 (-1.6)	-700 (-1.6)	-700 (-1.6)
Sep	-	-1,200 (-2.8)	-1,200 (-2.8)	-1,200 (-2.8)	-1,200 (-2.8)	-1,200 (-2.8)	-1,200 (-2.8)	-1,200 (-2.8)
Oct	-	-2,400 (-5.8)	-2,400 (-5.8)	-2,400 (-5.8)	-2,400 (-5.8)	-2,400 (-5.8)	-2,500 (-6.1)	-2,400 (-5.8)
Nov	-	-2,500 (-6.3)	-2,400 (-6.0)	-2,500 (-6.3)	-2,500 (-6.3)	-2,400 (-6.0)	-2,600 (-6.5)	-2,600 (-6.5)
Dec	-	-2,400 (-6.0)	-2,300 (-5.8)	-2,400 (-6.0)	-2,500 (-6.3)	-2,400 (-6.0)	-2,500 (-6.3)	-2,500 (-6.3)
Average	-	-4,300 (-11.3)	-4,300 (-11.3)	-4,400 (-11.6)	-4,200 (-11.1)	-4,400 (-11.6)	-4,400 (-11.6)	-4,400 (-11.6)

Table 60. Mean Monthly Storage Dry Year (2004) – Homestake Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Storage (ac-ft)								
Jan	17,200	5,100	5,100	5,100	5,100	5,100	5,100	5,100
Feb	17,300	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Mar	17,400	5,200	5,200	5,200	5,200	5,200	5,200	5,200
Apr	17,500	5,400	5,400	5,400	5,400	5,400	5,400	5,400
May	19,900	11,500	11,500	11,500	11,500	11,500	11,500	11,500
Jun	27,800	24,300	24,300	24,300	24,300	24,300	24,300	24,300
Jul	32,400	29,600	29,600	29,600	29,600	29,600	29,700	29,700
Aug	27,200	23,900	23,900	24,000	23,900	24,000	24,000	24,000
Sep	23,300	22,300	22,400	22,400	22,400	22,400	22,500	22,500
Oct	14,900	14,700	14,800	14,800	14,500	14,800	14,800	14,800
Nov	10,800	11,900	12,000	12,000	11,400	12,000	12,000	12,000
Dec	10,900	12,000	12,100	12,100	11,600	12,100	12,100	12,100
Average	19,700	14,300	14,300	14,400	14,200	14,400	14,400	14,400
Change in Storage Compared to No Action [ac-ft (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.3)	100 (0.3)
Aug	-	-	0 (0.0)	100 (0.4)	0 (0.0)	100 (0.4)	100 (0.4)	100 (0.4)
Sep	-	-	100 (0.4)	100 (0.4)	100 (0.4)	100 (0.4)	200 (0.9)	200 (0.9)
Oct	-	-	100 (0.7)	100 (0.7)	-200 (-1.4)	100 (0.7)	100 (0.7)	100 (0.7)
Nov	-	-	100 (0.8)	100 (0.8)	-500 (-4.2)	100 (0.8)	100 (0.8)	100 (0.8)
Dec	-	-	100 (0.8)	100 (0.8)	-400 (-3.3)	100 (0.8)	100 (0.8)	100 (0.8)
Average	-	-	0 (0.0)	100 (0.7)	-100 (-0.7)	100 (0.7)	100 (0.7)	100 (0.7)
Change in Storage Compared to Existing Conditions [ac-ft (%)]								
Jan	-	-12,100 (-70.3)	-12,100 (-70.3)	-12,100 (-70.3)	-12,100 (-70.3)	-12,100 (-70.3)	-12,100 (-70.3)	-12,100 (-70.3)
Feb	-	-12,100 (-69.9)	-12,100 (-69.9)	-12,100 (-69.9)	-12,100 (-69.9)	-12,100 (-69.9)	-12,100 (-69.9)	-12,100 (-69.9)
Mar	-	-12,200 (-70.1)	-12,200 (-70.1)	-12,200 (-70.1)	-12,200 (-70.1)	-12,200 (-70.1)	-12,200 (-70.1)	-12,200 (-70.1)
Apr	-	-12,100 (-69.1)	-12,100 (-69.1)	-12,100 (-69.1)	-12,100 (-69.1)	-12,100 (-69.1)	-12,100 (-69.1)	-12,100 (-69.1)
May	-	-8,400 (-42.2)	-8,400 (-42.2)	-8,400 (-42.2)	-8,400 (-42.2)	-8,400 (-42.2)	-8,400 (-42.2)	-8,400 (-42.2)
Jun	-	-3,500 (-12.6)	-3,500 (-12.6)	-3,500 (-12.6)	-3,500 (-12.6)	-3,500 (-12.6)	-3,500 (-12.6)	-3,500 (-12.6)
Jul	-	-2,800 (-8.6)	-2,800 (-8.6)	-2,800 (-8.6)	-2,800 (-8.6)	-2,800 (-8.6)	-2,700 (-8.3)	-2,700 (-8.3)
Aug	-	-3,300 (-12.1)	-3,300 (-12.1)	-3,200 (-11.8)	-3,300 (-12.1)	-3,200 (-11.8)	-3,200 (-11.8)	-3,200 (-11.8)
Sep	-	-1,000 (-4.3)	-900 (-3.9)	-900 (-3.9)	-900 (-3.9)	-900 (-3.9)	-800 (-3.4)	-800 (-3.4)
Oct	-	-200 (-1.3)	-100 (-0.7)	-100 (-0.7)	-400 (-2.7)	-100 (-0.7)	-100 (-0.7)	-100 (-0.7)
Nov	-	1,100 (10.2)	1,200 (11.1)	1,200 (11.1)	600 (5.6)	1,200 (11.1)	1,200 (11.1)	1,200 (11.1)
Dec	-	1,100 (10.1)	1,200 (11.0)	1,200 (11.0)	700 (6.4)	1,200 (11.0)	1,200 (11.0)	1,200 (11.0)
Average	-	-5,400 (-27.4)	-5,400 (-27.4)	-5,300 (-26.9)	-5,500 (-27.9)	-5,300 (-26.9)	-5,300 (-26.9)	-5,300 (-26.9)

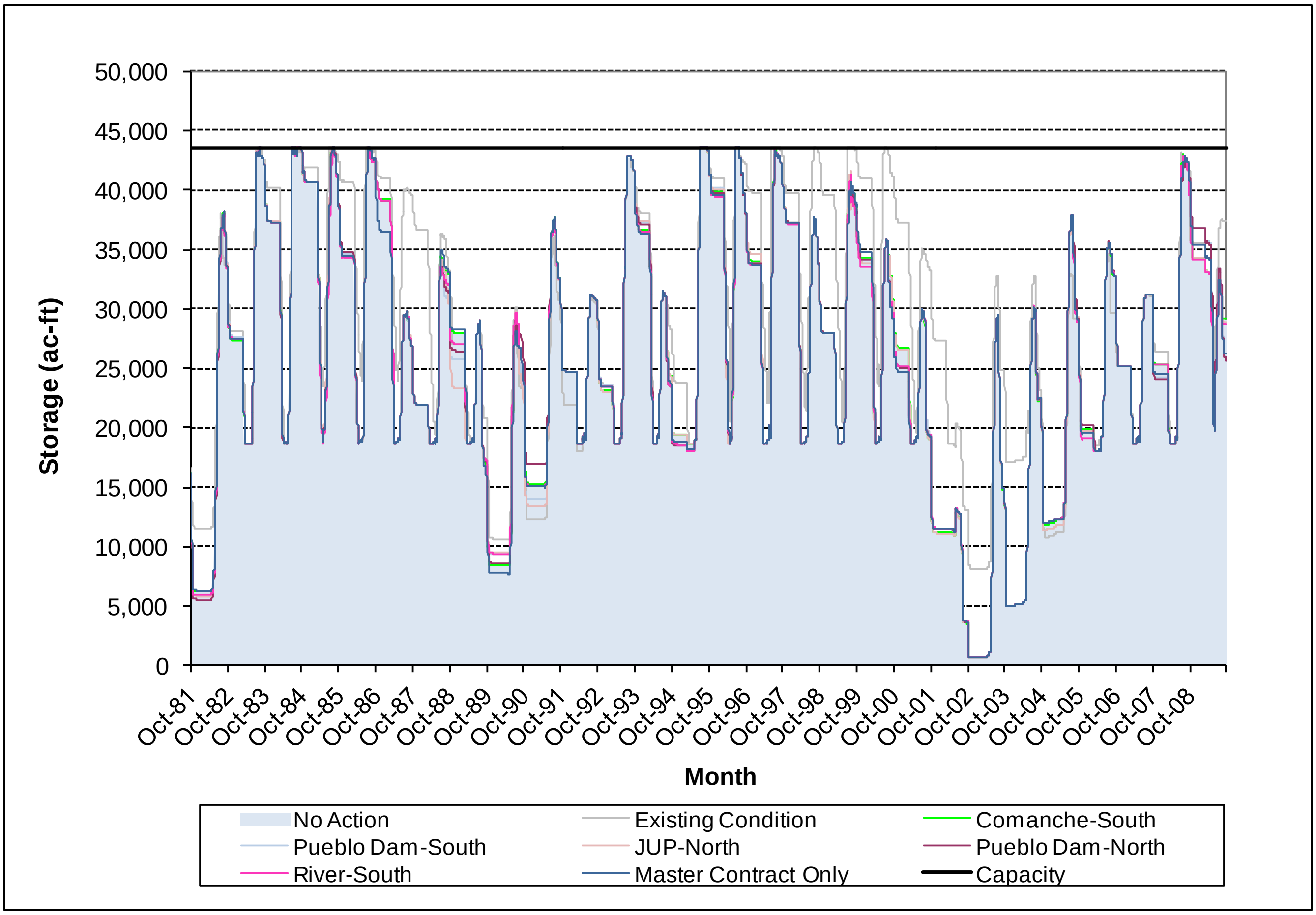


Figure 18. Simulated Time-Series Storage - Homestake Reservoir (Cumulative Effects)

Grape Creek Analysis

Grape Creek in Custer County would be affected by the transfer of water from irrigation to municipal use. Irrigation water previously diverted to cropland and consumptively used by crops would remain in Grape Creek, where it would be conveyed to Pueblo Reservoir for delivery to Fountain Valley Authority municipal entities. The primary effect of this transfer would be increased streamflow in Grape Creek. Although yields from the Custer County water rights are included in the Daily Model, explicit simulation of Grape Creek is not included in the model (see Appendix D.3). This section describes the calculation of simulated streamflow in Grape Creek based on estimation of the water rights' historical consumptive use.

Methods

The study area includes Grape Creek downstream from W.A. Bell #1, W.A. Bell #2 and W.A. Bell #3 diversions. These diversions are located on tributaries of Grape Creek southwest of Westcliffe, about 5 miles upstream from DeWeese Reservoir and 29 miles upstream from the confluence of Grape Creek and the Arkansas River near Cañon City. The Grape Creek near Westcliffe gaging station (USGS Station No. 07095000) is the only gaging station on Grape Creek and is located approximately 0.5 miles upstream from DeWeese Reservoir (Figure 19). The water rights being considered in this analysis are those owned by the City of Fountain and Widefield Water and Sanitation District for portions of W.A. Bell #1, W.A. Bell #2 and W.A. Bell #3 ditches under case no. 08CW47, Division 2.

The method used to calculate simulated streamflow in Grape Creek was to add estimated historical consumptive use to historical streamflow. Historical streamflow at the Grape Creek gage was obtained from the Colorado Decision Support System Hydrobase database (Colorado Decision Support System 2011). Estimated consumptive use calculations are described below. This method assumes that the portion of land from which water is transferred is dried up, and any consumptive use water that was historically used by this land accrues to Grape Creek regardless of whether conditions in the decree allow the water rights to be diverted at Pueblo Reservoir due to daily or annual volumetric limitations. It may be possible that if the water could not be diverted at Pueblo Reservoir under the water right, it would be diverted by other water rights in Grape Creek, including DeWeese Reservoir. Without a detailed water rights accounting model or analysis of Grape Creek, it is unknown where else this water might be diverted. The amount of consumptive use water that could not be diverted under the decree is likely to be small (likely less than 150 acre-feet per year), so this assumption has little effect on the results of the analysis. This assumption also results in a more conservative estimate of the maximum potential increase (or effect) in Grape Creek streamflow.

Consumptive use of the water right was primarily based on information available in the water rights application and historical diversion data available from the Colorado Decision Support System (2011; Figure 20). The water rights application indicates that Fountain and Widefield own approximately 69.0 percent, 77.2 percent and 74.1 percent of W.A. Bell #1, W.A. Bell #2 and W.A. Bell #3 ditches, respectively. The Fountain and Widefield ownership of historical diversions was estimated by multiplying historical diversions by these percentages. Consumptive use from these diversions was estimated as 77 percent of total diversions. This was calculated as the estimated consumptive use of the dried up land area (486 acres from the water rights application) and a countywide estimate of consumptive use of 1.26 acre-feet per acre (from data contained in Frank and Carlson 1999), and divided by total historical diversions owned under the water right. Daily historical consumptive use was then added to historical streamflow to determine simulated streamflow for those alternatives that include the transfer (all simulations except existing conditions). Because of a lack of complete diversion data for 2008 and 2009 in the CDSS records, these years were excluded from the analysis.

It is likely that transfer of these water rights would affect sub-surface return flows, which may then result in changes to streamflow. A detailed return flow analysis was not conducted as part of this analysis. The analysis inherently assumes that all historical return flows accrue to the stream system in the same month as the diversion, and would be replaced as such by undiverted non-consumptive use. This assumption was deemed appropriate for the level of analysis required to determine effects in the EIS.

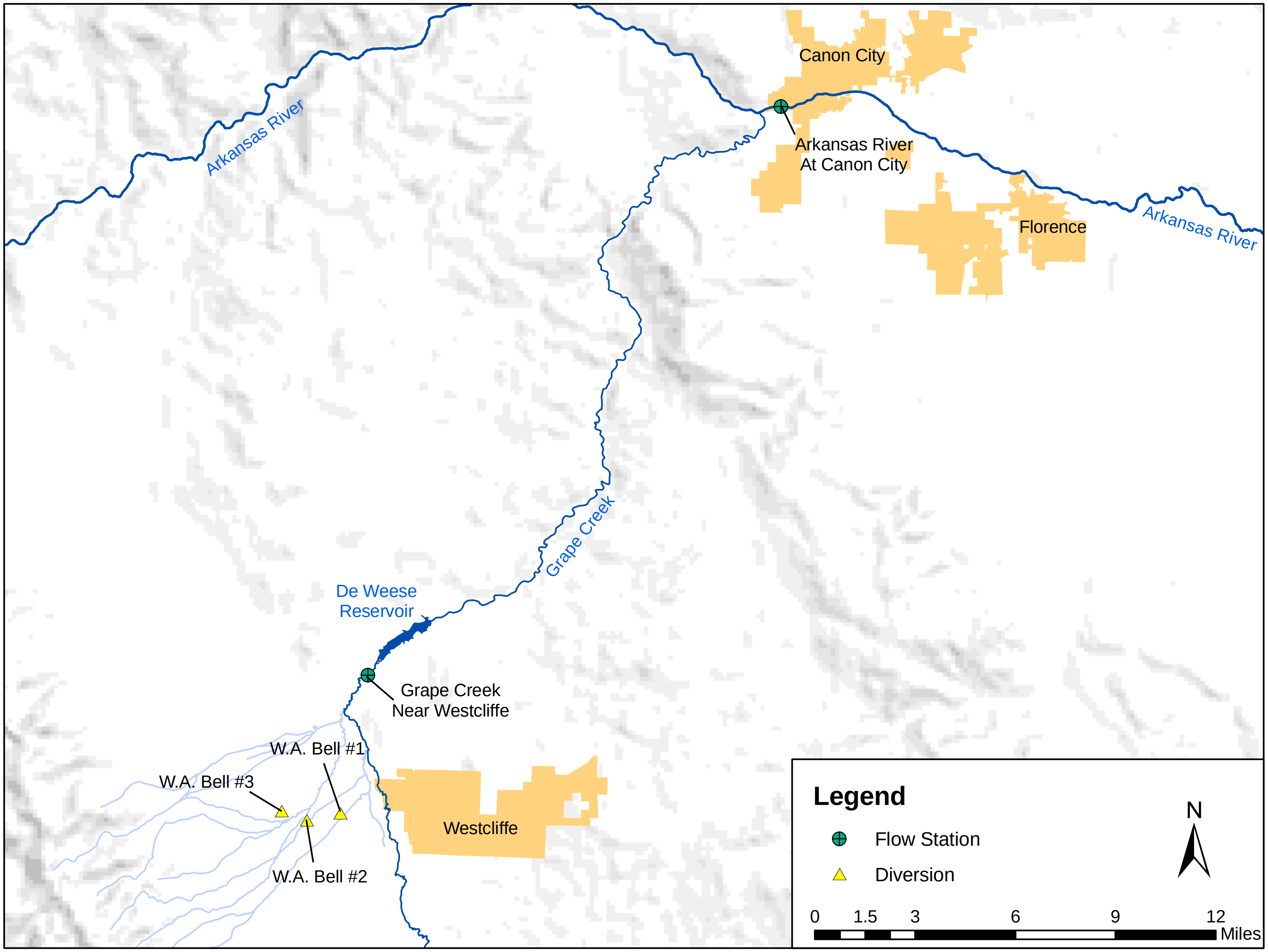


Figure 19. Grape Creek Location Map

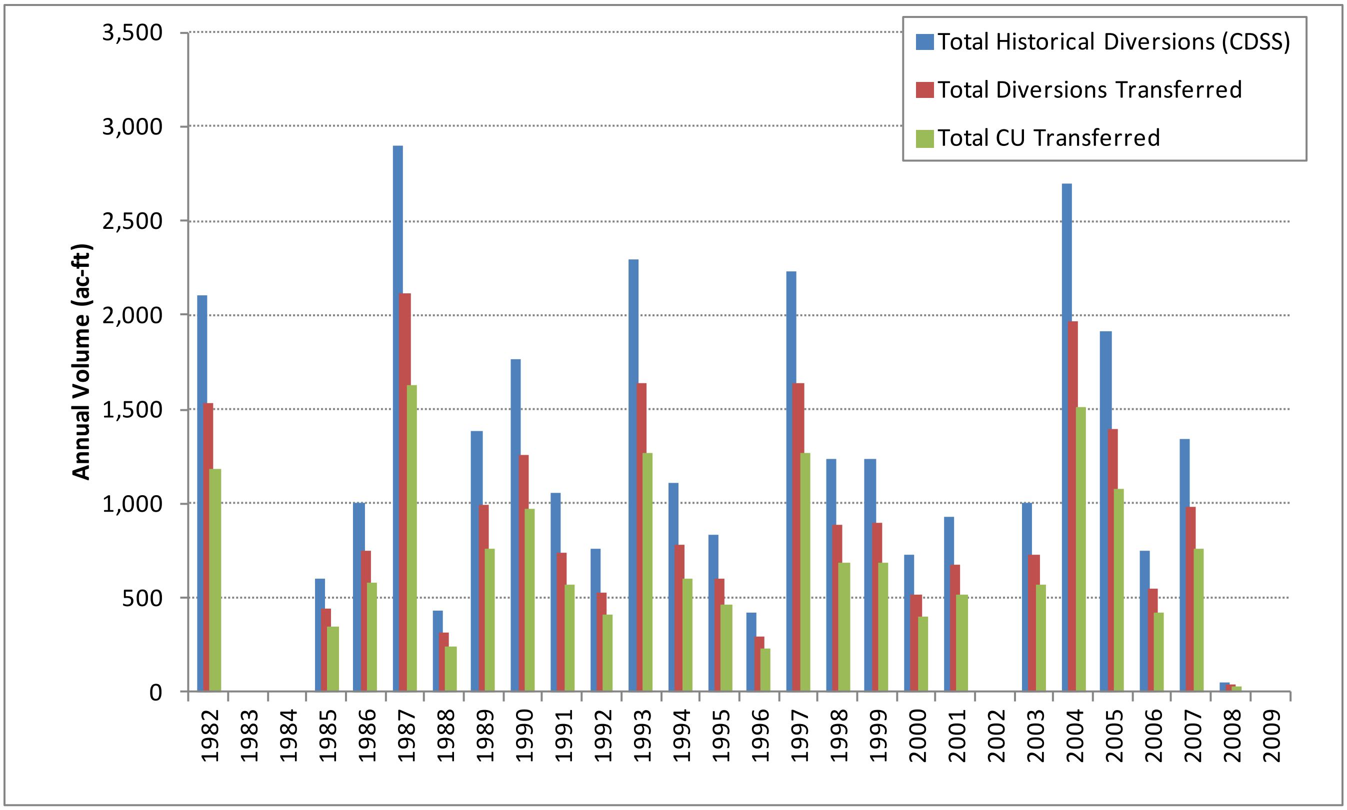


Figure 20. Historical W.A. Bell Ditch Diversions and Consumptive Use Estimations

Results

There are no effects for any alternatives when compared with the No Action Alternative, because all alternatives including the No Action Alternative simulate transfer of the W.A. Bell Ditch water rights. Average monthly streamflow would increase for all alternatives from existing conditions by approximately one to three cfs during spring, summer and early fall months (Table 61). Increases in average monthly streamflow for typical normal, wet and dry years would be up to seven cfs from existing conditions during the summer months (
Table 62, Table 63 and Table 64). Increase during these years are all greater than the overall overage because they, coincidentally, are years with greater than average historical diversions by the W.A. Bell ditches (as previously shown in Figure 20). There are years (especially during extremely wet years and extremely dry years) when there would be no increase in flow from existing conditions.

There are no reasonably foreseeable actions in Grape Creek that contribute to additional changes in simulated streamflow for the cumulative effects analysis. All simulated streamflow and associated effects are the same for the cumulative effects analysis as the direct effects analysis.

All of the analyses in this section are based on the assumptions and methods previously described. The W.A. Bell Ditch water rights have not yet been decreed in water court. If and when these transfers are decreed, there could be provisions of the final decree that result in differences from the assumptions stated above. It is not anticipated, under any circumstances, that the transfer of these water rights would cause a decrease in overall average streamflow. Transfer of the water rights could result in changes to sub-surface return flows that may cause a small decrease in flow during some months (as previously stated, a return flow analysis was not conducted as part of this analysis). These changes would be the same for all alternatives, including the No Action Alternative.

Table 61. Mean Monthly Streamflow Overall Average– Grape Creek near Westcliffe (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	17	17	17	17	17	17	17	17
Feb	20	20	20	20	20	20	20	20
Mar	37	37	37	37	37	37	37	37
Apr	54	54	54	54	54	54	54	54
May	77	78	78	78	78	78	78	78
Jun	96	99	99	99	99	99	99	99
Jul	46	48	48	48	48	48	48	48
Aug	41	42	42	42	42	42	42	42
Sep	21	22	22	22	22	22	22	22
Oct	19	20	20	20	20	20	20	20
Nov	22	22	22	22	22	22	22	22
Dec	18	18	18	18	18	18	18	18
Average	39	40	40	40	40	40	40	40
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)	0 (0.2)
May	-	1 (1.9)	1 (1.9)	1 (1.9)	1 (1.9)	1 (1.9)	1 (1.9)	1 (1.9)
Jun	-	3 (3.6)	3 (3.6)	3 (3.6)	3 (3.6)	3 (3.6)	3 (3.6)	3 (3.6)
Jul	-	3 (5.8)	3 (5.8)	3 (5.8)	3 (5.8)	3 (5.8)	3 (5.8)	3 (5.8)
Aug	-	1 (3.0)	1 (3.0)	1 (3.0)	1 (3.0)	1 (3.0)	1 (3.0)	1 (3.0)
Sep	-	1 (3.8)	1 (3.8)	1 (3.8)	1 (3.8)	1 (3.8)	1 (3.8)	1 (3.8)
Oct	-	0 (2.5)	0 (2.5)	0 (2.5)	0 (2.5)	0 (2.5)	0 (2.5)	0 (2.5)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)

Table 62. Monthly Streamflow Normal Year (2005) – Grape Creek near Westcliffe (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	27	27	27	27	27	27	27	27
Feb	35	35	35	35	35	35	35	35
Mar	30	30	30	30	30	30	30	30
Apr	42	42	42	42	42	42	42	42
May	105	108	108	108	108	108	108	108
Jun	88	95	95	95	95	95	95	95
Jul	22	27	27	27	27	27	27	27
Aug	47	47	47	47	47	47	47	47
Sep	13	13	13	13	13	13	13	13
Oct	27	28	28	28	28	28	28	28
Nov	21	21	21	21	21	21	21	21
Dec	18	18	18	18	18	18	18	18
Average	39	41	41	41	41	41	41	41
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	4 (3.5)	4 (3.5)	4 (3.5)	4 (3.5)	4 (3.5)	4 (3.5)	4 (3.5)
Jun	-	7 (7.8)	7 (7.8)	7 (7.8)	7 (7.8)	7 (7.8)	7 (7.8)	7 (7.8)
Jul	-	4 (19.0)	4 (19.0)	4 (19.0)	4 (19.0)	4 (19.0)	4 (19.0)	4 (19.0)
Aug	-	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)
Sep	-	1 (4.7)	1 (4.7)	1 (4.7)	1 (4.7)	1 (4.7)	1 (4.7)	1 (4.7)
Oct	-	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	1 (3.5)	1 (3.5)	1 (3.5)	1 (3.5)	1 (3.5)	1 (3.5)	1 (3.5)

Table 63. Monthly Streamflow Wet Year (1997) – Grape Creek near Westcliffe (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	12	12	12	12	12	12	12	12
Feb	20	20	20	20	20	20	20	20
Mar	35	35	35	35	35	35	35	35
Apr	25	26	26	26	26	26	26	26
May	29	32	32	32	32	32	32	32
Jun	139	146	146	146	146	146	146	146
Jul	19	24	24	24	24	24	24	24
Aug	62	63	63	63	63	63	63	63
Sep	31	32	32	32	32	32	32	32
Oct	27	27	27	27	27	27	27	27
Nov	36	36	36	36	36	36	36	36
Dec	23	23	23	23	23	23	23	23
Average	38	40	40	40	40	40	40	40
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.4)	0 (0.4)	0 (0.4)	0 (0.4)	0 (0.4)	0 (0.4)	0 (0.4)
Apr	-	1 (5.2)	1 (5.2)	1 (5.2)	1 (5.2)	1 (5.2)	1 (5.2)	1 (5.2)
May	-	4 (12.9)	4 (12.9)	4 (12.9)	4 (12.9)	4 (12.9)	4 (12.9)	4 (12.9)
Jun	-	7 (5.2)	7 (5.2)	7 (5.2)	7 (5.2)	7 (5.2)	7 (5.2)	7 (5.2)
Jul	-	5 (28.6)	5 (28.6)	5 (28.6)	5 (28.6)	5 (28.6)	5 (28.6)	5 (28.6)
Aug	-	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)
Sep	-	0 (1.2)	0 (1.2)	0 (1.2)	0 (1.2)	0 (1.2)	0 (1.2)	0 (1.2)
Oct	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	2 (4.3)	2 (4.3)	2 (4.3)	2 (4.3)	2 (4.3)	2 (4.3)	2 (4.3)

Table 64. Monthly Streamflow Dry Year (2004) – Grape Creek near Westcliffe (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	14	14	14	14	14	14	14	14
Feb	11	11	11	11	11	11	11	11
Mar	31	31	31	31	31	31	31	31
Apr	43	43	43	43	43	43	43	43
May	31	36	36	36	36	36	36	36
Jun	13	19	19	19	19	19	19	19
Jul	32	39	39	39	39	39	39	39
Aug	17	20	20	20	20	20	20	20
Sep	9	10	10	10	10	10	10	10
Oct	16	17	17	17	17	17	17	17
Nov	20	20	20	20	20	20	20	20
Dec	18	18	18	18	18	18	18	18
Average	21	23	23	23	23	23	23	23
Change in Flow Compared to No Action [cfs (%)]								
Jan	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	-	5 (15.4)	5 (15.4)	5 (15.4)	5 (15.4)	5 (15.4)	5 (15.4)	5 (15.4)
Jun	-	7 (52.0)	7 (52.0)	7 (52.0)	7 (52.0)	7 (52.0)	7 (52.0)	7 (52.0)
Jul	-	7 (20.8)	7 (20.8)	7 (20.8)	7 (20.8)	7 (20.8)	7 (20.8)	7 (20.8)
Aug	-	3 (17.2)	3 (17.2)	3 (17.2)	3 (17.2)	3 (17.2)	3 (17.2)	3 (17.2)
Sep	-	1 (16.9)	1 (16.9)	1 (16.9)	1 (16.9)	1 (16.9)	1 (16.9)	1 (16.9)
Oct	-	1 (4.8)	1 (4.8)	1 (4.8)	1 (4.8)	1 (4.8)	1 (4.8)	1 (4.8)
Nov	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	-	2 (9.1)	2 (9.1)	2 (9.1)	2 (9.1)	2 (9.1)	2 (9.1)	2 (9.1)

John Martin Reservoir to Kansas Stateline Analysis

The Daily Model simulation area ends at the Arkansas River at the Las Animas gage, and does not simulate storage or streamflow downstream (see Appendix D.3). An underlying assumption of the Daily Model is that the simulated decrees for any changed water rights (changes-in-use, alternate points-of-diversion and exchanges) are developed and operated in a manner that would not injure senior water rights or the ability of Colorado to meet terms of the Arkansas River Compact. Simulated diversions for water rights are curtailed according to Colorado Water law when flow is insufficient. Historical flow at Las Animas is given the highest priority in the Daily Model. Because of this assumption, and that AVC demands downstream from Las Animas are relatively small and no Master Contract supplies originate downstream from John Martin Reservoir, a simplified approach was used to determine effects of the AVC and Master Contract in and downstream from John Martin Reservoir.

Methods

A sequential mass balance analysis was used to determine effects of the alternatives on John Martin Reservoir storage contents and releases. The mass balance analysis is a spreadsheet simulation that determines storage contents and releases on a monthly time step, by balancing inflows, evaporation, spills, and releases for downstream demands. The same hydrologic study period of water years 1982 through 2009 was selected for the mass balance analysis as used in the Daily Model.

The John Martin Reservoir mass balance analysis uses historical Purgatoire River streamflow for all alternatives. Simulated Arkansas River streamflow (Las Animas gage) from the Daily Model (Table 65) is used to assess EIS alternatives, and is the only inflow variable to the mass balance analysis. For simplification, no ungaged inflows were considered by this spreadsheet model. For example, the ungaged tributaries that contribute inflows to John Martin Reservoir are not in the model.

Table 65. Simulated Monthly Average Streamflow at the Arkansas River at Las Animas gage

Month	Simulated Monthly Average Streamflow (cfs)							
	Existing Condition	No Action	Comanche-South	Pueblo Dam-South	JUP-North	Pueblo Dam-North	River-South	Master Contract Only
Streamflow Used for Direct Effects Analysis								
Jan	184	183	183	183	183	183	183	183
Feb	201	202	203	203	204	203	202	202
Mar	134	151	150	150	147	150	152	149
Apr	160	162	174	174	160	174	173	178
May	571	579	582	581	578	582	581	583
Jun	850	847	846	846	847	846	847	853
Jul	489	496	496	490	474	497	499	500
Aug	303	308	310	311	311	310	310	313
Sep	122	124	124	124	125	124	124	124
Oct	155	156	156	156	156	156	156	155
Nov	154	154	155	155	155	154	155	155
Dec	151	151	150	150	152	150	150	150
Average	313	317	318	318	315	318	319	320
Streamflow Used for Cumulative Effects								
Jan	184	187	187	187	187	187	187	187
Feb	201	212	218	218	217	218	210	212
Mar	134	154	156	156	154	156	155	156
Apr	160	135	135	134	131	134	131	135
May	571	576	573	573	570	573	573	578
Jun	850	819	823	824	818	824	824	822
Jul	489	451	451	450	452	451	451	456
Aug	303	309	312	312	309	312	310	309
Sep	122	130	130	131	131	131	131	129
Oct	155	157	159	159	158	159	160	158
Nov	154	155	155	155	156	155	155	155
Dec	151	153	153	153	153	153	153	153
Average	313	307	308	308	307	308	307	308

Conservation Storage and Section II accounts

Several storage accounts are used in John Martin Reservoir operations, and are described in the 1980 Operating Plan. These accounts include the Permanent Pool, Conservation Storage, Section II accounts, and Section III accounts and the Offset account. The Permanent Pool is for fish, wildlife, and recreational purposes. Under specified inflow conditions, Conservation Storage is used to store inflow for subsequent allocation to Section II accounts. Section II accounts belong to Colorado District 67 canals and ditches, and the State of Kansas. Section II accounts include the transfer of Compact conservation storage and a 35% charge on water stored in Section III accounts. Section III account holders include Amity, Fort Lyon, and Las Animas Consolidated. Before the 1980 Operating Plan, the only accounts were conservation storage, flood control space, and permanent pool within John Martin Reservoir. It should also be noted that during the study period, the City of Lamar had a small reregulating account for their share of the Fry-Ark Project Water. This account is not explicitly simulated in the mass balance analysis.

The mass balance analysis simplifies operations of John Martin Reservoir by only simulating Conservation Storage and the District 67 and Kansas Section II accounts. Not simulating the permanent pool or the Section III accounts was deemed adequate for determining relative effects in the EIS for the following reasons:

- The H-I model, used for Compact Administration, does not simulate the majority of Section III accounts or the permanent pool.

- Most inflows and deliveries to and from John Martin Reservoir are managed through Conservation Storage and Section II accounts.
- Section III account supplies and operations are not anticipated to be affected by the alternatives, as the supplies are predominately agricultural diversions and winter water, both of which typically have higher priorities than Pueblo Reservoir excess capacity account supplies.

Simulation of Conservation Storage consists of two storage periods. For simplicity, it was assumed that all inflows into John Martin Reservoir during the Winter Storage period (November-March) accrue to Conservation Storage. This water is stored until the end of the winter storage period, and is released to Section II accounts on the simulated April 1 date. Inflows accrue to Conservation Storage during the Summer Storage period (April-October) only when inflows into John Martin Reservoir exceed the existing irrigation requirements of the ditches of District 67 by at least 1,000 acre feet. The mass balance converts this value to a monthly volume to determine when Conservation Storage would occur in the summer. Conservation Storage during the Summer Storage period must be released to Section II accounts within 48 hours of the summer storage event. During times when inflows are diverted to winter or summer Conservation Storage, District 67 canals and ditches are removed from the priority system on the Arkansas River, and must satisfy demand with Section II supplies.

Releases of Conservation Storage to Section II accounts in the mass balance analysis are constrained by the flow limits in the 1980 Operating Plan (1,000 cfs or 1,250 cfs when Conservation Storage exceeds 20,000 ac-ft). When Conservation Storage is transferred to Section II accounts, 60 percent is apportioned to the District 67 accounts and 40 percent is apportioned to the Kansas account (Table 66). The mass balance analysis does not simulate separate District 67 canals' Section II accounts or demands.

Table 66. Allocation of John Martin Reservoir Conservation Storage to Section II Accounts

Entity	Allocation of Conservation Storage (%)
State of Kansas	*40.00*
Colorado District 67	*60.00*
Fort Bent Canal	5.94
Keesee Ditch	1.38
Amity Canal	29.70
Lamar Canal	11.88
Hyde Ditch	0.78
Manvel Canal	1.44
X-Y and Graham Ditch	3.06
Buffalo Canal	5.10
Sisson-Stubbs Ditch	0.72

Evaporation and Spills

The 1980 Operating Plan requires evaporation losses to be prorated among all reservoir accounts, including Conservation Storage. The mass balance analysis uses monthly average pan evaporation values (Table 67), in conjunction with the reservoir area-capacity curve, to determine monthly volumetric evaporation losses (Western Regional Climate Center, 2010). A 0.7 coefficient was used to convert pan evaporation to reservoir evaporation. These losses are prorated among simulated accounts.

Table 67. Monthly Average Pan Evaporation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pan Evaporation (inches) [(1)]	0	0	6.4	8.04	9.67	11.3	12.31	10.28	7.82	5.61	2.78	0

Source: Western Regional Climate Center 2010
Notes:
(1) Period of record: 1941-2005.

Account capacities from the H-I model were used to calculate spills in the mass balance analysis. The H-I capacities used in this analysis are reduced periodically to account for siltation (Littleworth 2008). The operation plan outlines the priority of spills in John Martin Reservoir. Conservation Storage and Section II accounts are among the last accounts to spill. The mass balance analysis computes the total spill amount at the end of each monthly time step, and then prorates the spill among the Section II accounts. Any remaining spill occurs from Conservation Storage.

Demands

The following sections describe the District 67 and Kansas demands and simulated supplies in the mass balance analysis.

Colorado District 67 Demands

A monthly time series of historical headgate deliveries for District 67 canals were compiled from daily data. Table 68 lists the monthly time series' average historical demand. The monthly demand is first met using Arkansas River flows between John Martin Reservoir and the Arkansas River near Granada gage. Arkansas River flow is computed as John Martin Reservoir inflow minus diversion to Conservation Storage, plus the sum of downstream inflows and calculated ungaged gains/losses. It is assumed that transit losses associated with this streamflow are accounted for in the gains/losses.

District 67 demand not met with Arkansas River streamflow is met with Section II account storage contents. Releases from Section II accounts incur a transit loss that is not captured in the gains/losses. The transit loss between John Martin Reservoir and the Arkansas River near Granada gage was assumed to be the average cumulative transit loss (5.5 percent) from a similar reach (i.e. John Martin Reservoir to the Buffalo Canal) in the 2008 Livingston study. Though the Livingston study determined transit losses for various antecedent streamflow and reservoir release conditions, an average transit loss was deemed suitable for the spatiotemporal aggregation used in the mass balance analysis.

Table 68. Historical Colorado District 67 Monthly Average Demand

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand (ac-ft) [(1)]	334	391	3,459	19,361	28,264	31,300	34,716	29,211	21,846	15,149	3,355	549

Notes:
(1) Period of record: 10/1/1976-9/30/2009.

Kansas Demands

Since the Kansas calls calibrated for use in the H-I model are for determining Arkansas River Compact compliance, and are not suitable for reservoir and streamflow effects analysis during dry and wet years, the mass balance analysis uses historical Arkansas River near Coolidge streamflow and Frontier Ditch deliveries as a composite Stateline demand (Figure 21).

The monthly Stateline demand is first met in the mass balance analysis using Arkansas River flows at the Arkansas River near Coolidge gage. Arkansas River streamflow is computed as streamflow not used by District 67, plus the sum of inflows and calculated ungaged gains/losses in the river downstream from the Arkansas River near Granada gage. It is assumed that transit losses associated with this streamflow are accounted for in the gains/losses.

Stateline demand not met with Arkansas River streamflow is then met with Section II account storage contents. The 1980 Operating Plan calls for a Section III Kansas Transit Loss account of up to 1,700 acre feet to provide Kansas' losses. This account is filled with other Section III account diversions. Section III accounts are not simulated in this analysis, but Section III account delivery volumes are implicitly included in John Martin Reservoir inflows and assumed apportioned to Kansas and District 67. Because of this assumption, the District 67 Section II account is assumed to provide Kansas transit losses. These simplifying assumptions were necessary due to the limitations of the model. The transit loss between John Martin Reservoir and the Arkansas River near Coolidge gage was assumed to be the average cumulative transit loss (15.6 percent) from the same reach in the 2008 Livingston study, as previously described.

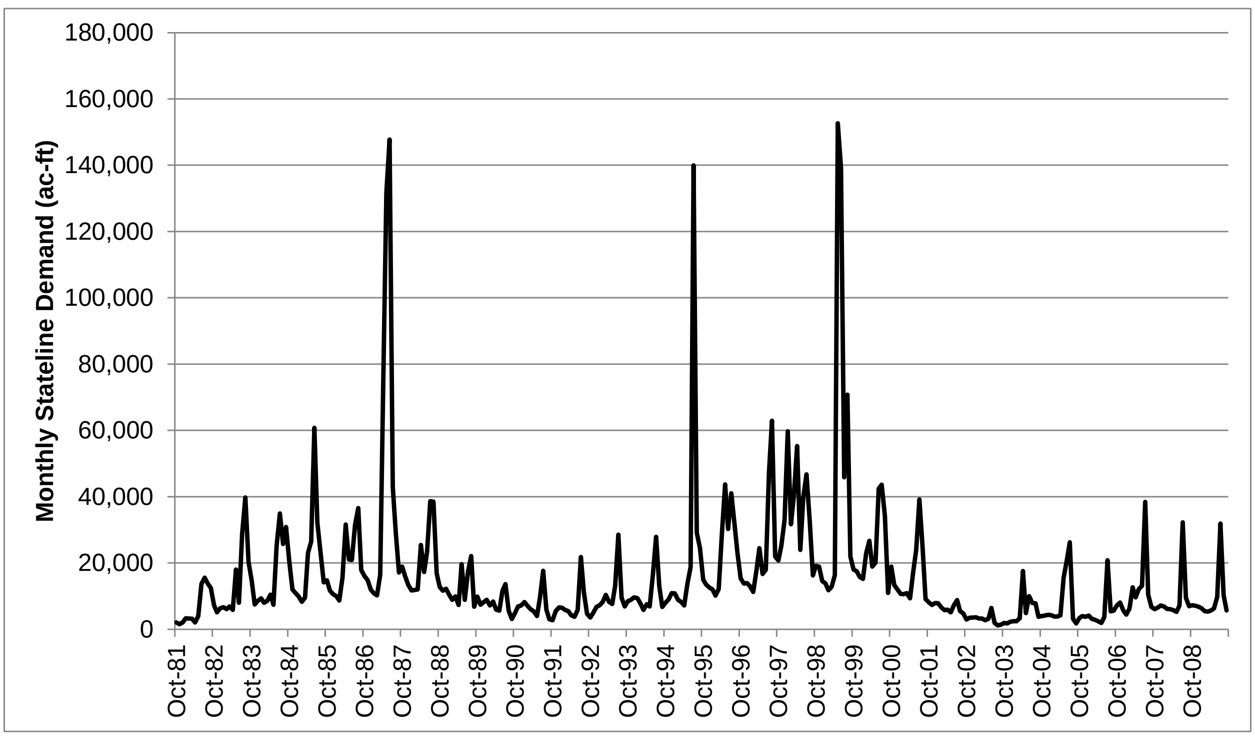


Figure 21. Historical Monthly Stateline Demand

AVC Participant Augmentation

Several AVC participants are located downstream from John Martin Reservoir, the largest being the City of Lamar. Many of these participants use alluvial pumping to meet demand, which requires augmentation of river depletions. This augmentation water comes from a variety of supplies both upstream and downstream from John Martin Reservoir. Implementation of the AVC would decrease alluvial pumping and the augmentation supply required by these participants.

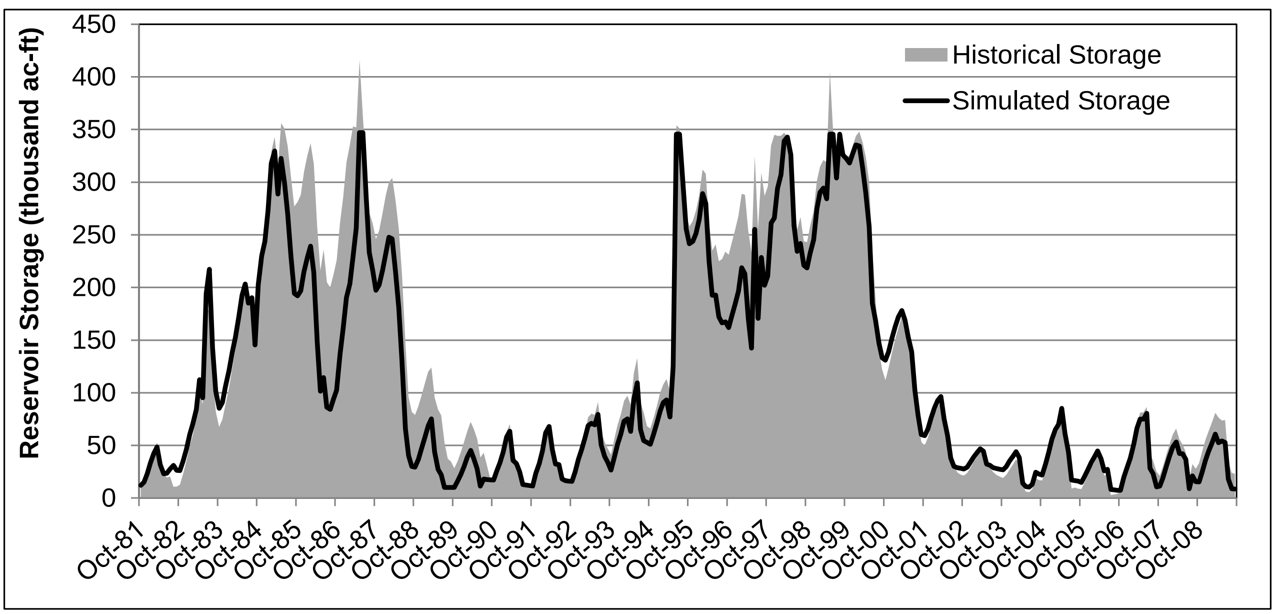
Because these participants' alluvial pumping is not simulated in the Daily Model, the mass balance analysis was used to quantify any effects. Effects could vary, depending on where water previously used for augmentation is diverted. This mass balance assumes this water is diverted upstream from John Martin Reservoir to determine maximum effect. The monthly augmentation replaced by AVC (Table 69) was subtracted from the John Martin inflows and the District 67 demand for alternatives with an AVC component.

Table 69. Monthly Average AVC Participant Augmentation Replaced by AVC

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Replaced Augmentation Supply (ac-ft)	24	24	29	39	55	60	70	64	54	39	24	24

Mass Balance Performance

A calibration of the mass balance analysis was not completed because of various simplifying assumptions, most notably the simulation of only Conservation and Section II accounts. Figure 22 shows that the mass balance adequately simulates general historical storage trends in John Martin Reservoir, and is sufficient for relative effects analysis.



Note: Simulated storage contents only include Conservation, Section II, and Permanent Pool Accounts. The Permanent Pool was not simulated, rather historical permanent pool values were added to the monthly simulated Conservation and Section II storage amounts. If historical Permanent Pool values were not available, the 1980 Operating Plan account size was used (10,000 ac-ft).

Figure 22. Historical and Simulated John Martin Reservoir Storage Contents.

Results

Direct and cumulative effects of alternatives on reservoir storage contents and streamflow are presented in this section. Consistent with the definition of direct and cumulative effects described in Chapter 4 of the EIS, direct and cumulative effects are calculated based on a comparison with the No Action

Alternative. Comparisons with existing conditions are also provided in the tables, but not used to determine effects.

Average monthly, typical normal-year, wet-year and dry-year data (consistent with the “typical-year” designations developed in Appendix D.4) are presented in the following sub-sections for John Martin Reservoir and the Arkansas near Granada gage.

John Martin Reservoir Storage Contents

A time series of John Martin Reservoir storage contents for direct effects is shown in Figure 23. Direct effects on storage contents, depth, and surface area for John Martin Reservoir are presented in Table 70 through Table 81. Monthly average direct effects are negligible for all alternatives when compared to the No Action Alternative, except for the Master Contract Only Alternative, which has minor increases in storage contents during the fall months. Direct effects in typical normal, wet, and dry years are negligible to minor increases in storage contents. The Master Contract Only Alternative typically has higher minor increases in storage, on average, than the No Action Alternative because of minor increases in Pueblo Reservoir storage, which results in a minor increase in spill volume from Pueblo Reservoir.

A time series of John Martin Reservoir storage contents for cumulative effects is shown in Figure 24. Cumulative effects on storage contents, depth, and cumulative effects for John Martin Reservoir are presented in Table 82 through Table 93. Monthly average cumulative effects are negligible for all alternatives when compared to the No Action Alternative. Cumulative effects in typical normal, wet, and dry years are between minor decreases to minor increases in storage contents. Minor increases in storage contents result from increases in upstream streamflow caused by additional return flows from large municipalities (see Appendix D.4). These streamflow increases predominately occur during the winter storage season.

In the cumulative effects, minor decreases in storage during the typical dry and normal year for the Master Contract Only Alternative is caused by differences in Pueblo Reservoir storage during wet years. The Master Contract Only Alternative has more Pueblo Reservoir storage than the No Action Alternative, causing more water to spill in this alternative in wet years. Spill increases in the wet year of 1999 reach John Martin Reservoir, causing it to spill. The John Martin Reservoir spill quantity for the Master Contract Only Alternative is greater than the No Action Alternative, but because of spill priorities, the bulk of the spill comes from the Colorado District 67 Section II account. This causes less storage in the Colorado District 67 Section II account to be carried forward, compared to the No Action Alternative. Because of usage rates for the Conservation and Section II accounts, less storage is available during the mid-2000s. The same result occurs in the existing conditions, which has high spills in the late 1990s, resulting in less storage in the subsequent dry years.

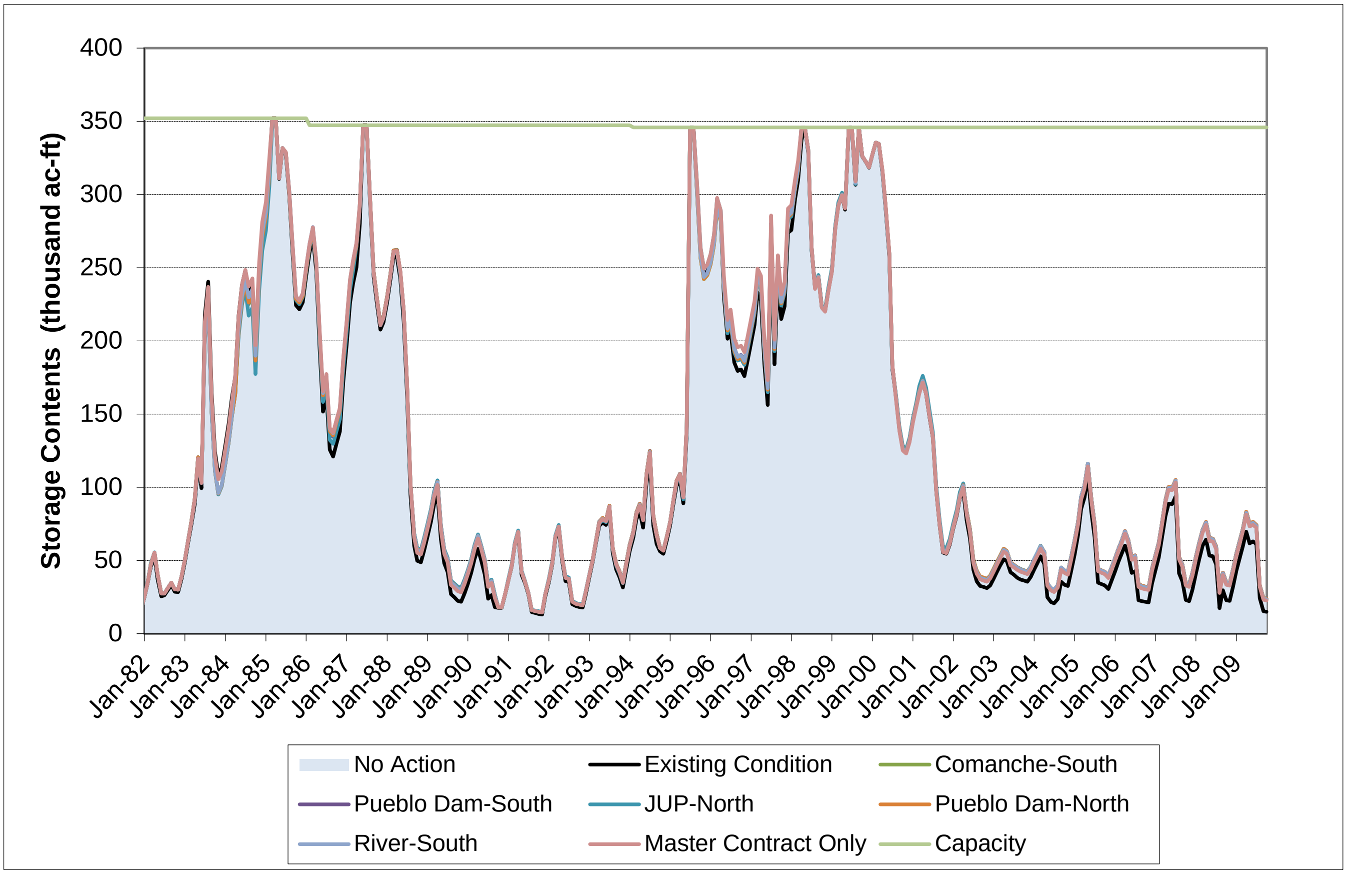


Figure 23. Storage Contents Time Series – John Martin Reservoir (Direct Effects)

Table 70. Monthly Storage Contents Overall Average – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	131,900	134,600	135,800	136,100	135,700	135,900	136,100	136,600
Feb	144,700	147,600	148,900	149,200	149,100	149,000	149,000	149,300
Mar	149,100	153,100	154,300	154,500	154,600	154,300	154,700	154,600
Apr	137,900	141,600	143,400	143,600	143,100	143,500	143,500	143,800
May	134,800	138,400	140,200	140,300	139,500	140,200	140,100	140,300
Jun	142,100	145,200	146,700	146,900	146,200	146,800	146,800	147,400
Jul	117,500	120,900	122,200	122,400	121,600	122,300	122,400	123,000
Aug	109,600	113,000	114,400	114,600	114,100	114,500	114,600	115,200
Sep	98,000	101,200	102,400	102,700	102,200	102,500	102,700	103,300
Oct	97,600	100,500	101,700	102,000	101,500	101,800	102,000	102,600
Nov	108,100	111,000	112,200	112,500	112,000	112,300	112,500	113,000
Dec	118,900	121,800	123,000	123,300	122,900	123,100	123,200	123,800
Average	124,200	127,400	128,800	129,000	128,500	128,900	129,000	129,400
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,200 (0.9)	1,500 (1.1)	1,100 (0.8)	1,300 (1.0)	1,500 (1.1)	2,000 (1.5)
Feb	---	---	1,300 (0.9)	1,600 (1.1)	1,500 (1.0)	1,400 (0.9)	1,400 (0.9)	1,700 (1.2)
Mar	---	---	1,200 (0.8)	1,400 (0.9)	1,500 (1.0)	1,200 (0.8)	1,600 (1.0)	1,500 (1.0)
Apr	---	---	1,800 (1.3)	2,000 (1.4)	1,500 (1.1)	1,900 (1.3)	1,900 (1.3)	2,200 (1.6)
May	---	---	1,800 (1.3)	1,900 (1.4)	1,100 (0.8)	1,800 (1.3)	1,700 (1.2)	1,900 (1.4)
Jun	---	---	1,500 (1.0)	1,700 (1.2)	1,000 (0.7)	1,600 (1.1)	1,600 (1.1)	2,200 (1.5)
Jul	---	---	1,300 (1.1)	1,500 (1.2)	700 (0.6)	1,400 (1.2)	1,500 (1.2)	2,100 (1.7)
Aug	---	---	1,400 (1.2)	1,600 (1.4)	1,100 (1.0)	1,500 (1.3)	1,600 (1.4)	2,200 (1.9)
Sep	---	---	1,200 (1.2)	1,500 (1.5)	1,000 (1.0)	1,300 (1.3)	1,500 (1.5)	2,100 (2.1)
Oct	---	---	1,200 (1.2)	1,500 (1.5)	1,000 (1.0)	1,300 (1.3)	1,500 (1.5)	2,100 (2.1)
Nov	---	---	1,200 (1.1)	1,500 (1.4)	1,000 (0.9)	1,300 (1.2)	1,500 (1.4)	2,000 (1.8)
Dec	---	---	1,200 (1.0)	1,500 (1.2)	1,100 (0.9)	1,300 (1.1)	1,400 (1.1)	2,000 (1.6)
Average	---	---	1,400 (1.1)	1,600 (1.3)	1,100 (0.9)	1,500 (1.2)	1,600 (1.3)	2,000 (1.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	2,700 (2.0)	3,900 (3.0)	4,200 (3.2)	3,800 (2.9)	4,000 (3.0)	4,200 (3.2)	4,700 (3.6)
Feb	---	2,900 (2.0)	4,200 (2.9)	4,500 (3.1)	4,400 (3.0)	4,300 (3.0)	4,300 (3.0)	4,600 (3.2)
Mar	---	4,000 (2.7)	5,200 (3.5)	5,400 (3.6)	5,500 (3.7)	5,200 (3.5)	5,600 (3.8)	5,500 (3.7)
Apr	---	3,700 (2.7)	5,500 (4.0)	5,700 (4.1)	5,200 (3.8)	5,600 (4.1)	5,600 (4.1)	5,900 (4.3)
May	---	3,600 (2.7)	5,400 (4.0)	5,500 (4.1)	4,700 (3.5)	5,400 (4.0)	5,300 (3.9)	5,500 (4.1)
Jun	---	3,100 (2.2)	4,600 (3.2)	4,800 (3.4)	4,100 (2.9)	4,700 (3.3)	4,700 (3.3)	5,300 (3.7)
Jul	---	3,400 (2.9)	4,700 (4.0)	4,900 (4.2)	4,100 (3.5)	4,800 (4.1)	4,900 (4.2)	5,500 (4.7)
Aug	---	3,400 (3.1)	4,800 (4.4)	5,000 (4.6)	4,500 (4.1)	4,900 (4.5)	5,000 (4.6)	5,600 (5.1)
Sep	---	3,200 (3.3)	4,400 (4.5)	4,700 (4.8)	4,200 (4.3)	4,500 (4.6)	4,700 (4.8)	5,300 (5.4)
Oct	---	2,900 (3.0)	4,100 (4.2)	4,400 (4.5)	3,900 (4.0)	4,200 (4.3)	4,400 (4.5)	5,000 (5.1)
Nov	---	2,900 (2.7)	4,100 (3.8)	4,400 (4.1)	3,900 (3.6)	4,200 (3.9)	4,400 (4.1)	4,900 (4.5)
Dec	---	2,900 (2.4)	4,100 (3.4)	4,400 (3.7)	4,000 (3.4)	4,200 (3.5)	4,300 (3.6)	4,900 (4.1)
Average	---	3,200 (2.6)	4,600 (3.7)	4,800 (3.9)	4,300 (3.5)	4,700 (3.8)	4,800 (3.9)	5,200 (4.2)

Table 71. Monthly Storage Contents Normal Year (2005) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	67,400	74,300	76,300	76,100	76,400	76,500	76,200	74,400
Feb	85,100	91,300	93,100	93,300	93,500	93,400	93,400	91,300
Mar	92,900	98,900	101,000	101,200	101,200	101,200	101,100	99,100
Apr	107,800	114,000	116,000	116,200	116,200	116,200	116,200	114,200
May	83,600	90,600	92,800	93,000	92,800	93,000	92,700	91,100
Jun	65,600	72,800	75,000	75,100	74,900	75,100	74,900	73,300
Jul	34,800	42,100	44,200	44,400	44,200	44,400	44,200	42,700
Aug	33,800	40,900	43,000	43,100	42,900	43,200	42,900	41,500
Sep	33,000	40,000	42,100	42,200	42,000	42,200	42,000	40,500
Oct	30,500	37,500	39,600	39,700	39,400	39,700	39,500	38,000
Nov	36,000	42,900	45,000	45,200	44,800	45,200	45,000	43,400
Dec	42,800	49,400	51,600	51,700	51,400	51,800	51,500	50,000
Average	59,400	66,200	68,300	68,400	68,300	68,500	68,300	66,600
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	2,000 (2.7)	1,800 (2.4)	2,100 (2.8)	2,200 (3.0)	1,900 (2.6)	100 (0.1)
Feb	---	---	1,800 (2.0)	2,000 (2.2)	2,200 (2.4)	2,100 (2.3)	2,100 (2.3)	0 (0.0)
Mar	---	---	2,100 (2.1)	2,300 (2.3)	2,300 (2.3)	2,300 (2.3)	2,200 (2.2)	200 (0.2)
Apr	---	---	2,000 (1.8)	2,200 (1.9)	2,200 (1.9)	2,200 (1.9)	2,200 (1.9)	200 (0.2)
May	---	---	2,200 (2.4)	2,400 (2.6)	2,200 (2.4)	2,400 (2.6)	2,100 (2.3)	500 (0.6)
Jun	---	---	2,200 (3.0)	2,300 (3.2)	2,100 (2.9)	2,300 (3.2)	2,100 (2.9)	500 (0.7)
Jul	---	---	2,100 (5.0)	2,300 (5.5)	2,100 (5.0)	2,300 (5.5)	2,100 (5.0)	600 (1.4)
Aug	---	---	2,100 (5.1)	2,200 (5.4)	2,000 (4.9)	2,300 (5.6)	2,000 (4.9)	600 (1.5)
Sep	---	---	2,100 (5.3)	2,200 (5.5)	2,000 (5.0)	2,200 (5.5)	2,000 (5.0)	500 (1.3)
Oct	---	---	2,100 (5.6)	2,200 (5.9)	1,900 (5.1)	2,200 (5.9)	2,000 (5.3)	500 (1.3)
Nov	---	---	2,100 (4.9)	2,300 (5.4)	1,900 (4.4)	2,300 (5.4)	2,100 (4.9)	500 (1.2)
Dec	---	---	2,200 (4.5)	2,300 (4.7)	2,000 (4.0)	2,400 (4.9)	2,100 (4.3)	600 (1.2)
Average	---	---	2,100 (3.2)	2,200 (3.3)	2,100 (3.2)	2,300 (3.5)	2,100 (3.2)	400 (0.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	6,900 (10.2)	8,900 (13.2)	8,700 (12.9)	9,000 (13.4)	9,100 (13.5)	8,800 (13.1)	7,000 (10.4)
Feb	---	6,200 (7.3)	8,000 (9.4)	8,200 (9.6)	8,400 (9.9)	8,300 (9.8)	8,300 (9.8)	6,200 (7.3)
Mar	---	6,000 (6.5)	8,100 (8.7)	8,300 (8.9)	8,300 (8.9)	8,300 (8.9)	8,200 (8.8)	6,200 (6.7)
Apr	---	6,200 (5.8)	8,200 (7.6)	8,400 (7.8)	8,400 (7.8)	8,400 (7.8)	8,400 (7.8)	6,400 (5.9)
May	---	7,000 (8.4)	9,200 (11.0)	9,400 (11.2)	9,200 (11.0)	9,400 (11.2)	9,100 (10.9)	7,500 (9.0)
Jun	---	7,200 (11.0)	9,400 (14.3)	9,500 (14.5)	9,300 (14.2)	9,500 (14.5)	9,300 (14.2)	7,700 (11.7)
Jul	---	7,300 (21.0)	9,400 (27.0)	9,600 (27.6)	9,400 (27.0)	9,600 (27.6)	9,400 (27.0)	7,900 (22.7)
Aug	---	7,100 (21.0)	9,200 (27.2)	9,300 (27.5)	9,100 (26.9)	9,400 (27.8)	9,100 (26.9)	7,700 (22.8)
Sep	---	7,000 (21.2)	9,100 (27.6)	9,200 (27.9)	9,000 (27.3)	9,200 (27.9)	9,000 (27.3)	7,500 (22.7)
Oct	---	7,000 (23.0)	9,100 (29.8)	9,200 (30.2)	8,900 (29.2)	9,200 (30.2)	9,000 (29.5)	7,500 (24.6)
Nov	---	6,900 (19.2)	9,000 (25.0)	9,200 (25.6)	8,800 (24.4)	9,200 (25.6)	9,000 (25.0)	7,400 (20.6)
Dec	---	6,600 (15.4)	8,800 (20.6)	8,900 (20.8)	8,600 (20.1)	9,000 (21.0)	8,700 (20.3)	7,200 (16.8)
Average	---	6,800 (11.4)	8,900 (15.0)	9,000 (15.2)	8,900 (15.0)	9,100 (15.3)	8,900 (15.0)	7,200 (12.1)

Table 72. Monthly Storage Contents Wet Year (1997) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	210,900	214,200	219,600	221,500	218,500	219,900	221,200	227,200
Feb	233,000	236,300	241,600	243,600	240,600	241,900	243,200	249,200
Mar	227,400	231,500	237,000	238,900	235,700	237,300	238,500	244,400
Apr	184,100	188,400	193,900	195,800	192,600	194,200	195,400	201,100
May	156,200	160,800	166,200	168,000	164,900	166,400	167,600	173,300
Jun	268,700	273,500	278,700	280,500	277,500	279,000	280,100	285,700
Jul	183,900	188,900	194,000	195,800	192,800	194,300	195,400	200,800
Aug	241,600	246,800	251,900	253,600	250,700	252,100	253,200	258,500
Sep	214,900	220,200	225,100	226,800	224,000	225,400	226,500	231,700
Oct	223,600	229,000	234,000	235,600	232,800	234,200	235,300	240,400
Nov	273,900	279,200	284,100	285,800	283,000	284,400	285,400	290,500
Dec	275,800	281,200	286,300	288,000	285,100	286,600	287,600	292,600
Average	224,500	229,200	234,400	236,200	233,200	234,600	235,800	241,300
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	5,400 (2.5)	7,300 (3.4)	4,300 (2.0)	5,700 (2.7)	7,000 (3.3)	13,000 (6.1)
Feb	---	---	5,300 (2.2)	7,300 (3.1)	4,300 (1.8)	5,600 (2.4)	6,900 (2.9)	12,900 (5.5)
Mar	---	---	5,500 (2.4)	7,400 (3.2)	4,200 (1.8)	5,800 (2.5)	7,000 (3.0)	12,900 (5.6)
Apr	---	---	5,500 (2.9)	7,400 (3.9)	4,200 (2.2)	5,800 (3.1)	7,000 (3.7)	12,700 (6.7)
May	---	---	5,400 (3.4)	7,200 (4.5)	4,100 (2.5)	5,600 (3.5)	6,800 (4.2)	12,500 (7.8)
Jun	---	---	5,200 (1.9)	7,000 (2.6)	4,000 (1.5)	5,500 (2.0)	6,600 (2.4)	12,200 (4.5)
Jul	---	---	5,100 (2.7)	6,900 (3.7)	3,900 (2.1)	5,400 (2.9)	6,500 (3.4)	11,900 (6.3)
Aug	---	---	5,100 (2.1)	6,800 (2.8)	3,900 (1.6)	5,300 (2.1)	6,400 (2.6)	11,700 (4.7)
Sep	---	---	4,900 (2.2)	6,600 (3.0)	3,800 (1.7)	5,200 (2.4)	6,300 (2.9)	11,500 (5.2)
Oct	---	---	5,000 (2.2)	6,600 (2.9)	3,800 (1.7)	5,200 (2.3)	6,300 (2.8)	11,400 (5.0)
Nov	---	---	4,900 (1.8)	6,600 (2.4)	3,800 (1.4)	5,200 (1.9)	6,200 (2.2)	11,300 (4.0)
Dec	---	---	5,100 (1.8)	6,800 (2.4)	3,900 (1.4)	5,400 (1.9)	6,400 (2.3)	11,400 (4.1)
Average	---	---	5,200 (2.3)	7,000 (3.1)	4,000 (1.7)	5,400 (2.4)	6,600 (2.9)	12,100 (5.3)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	3,300 (1.6)	8,700 (4.1)	10,600 (5.0)	7,600 (3.6)	9,000 (4.3)	10,300 (4.9)	16,300 (7.7)
Feb	---	3,300 (1.4)	8,600 (3.7)	10,600 (4.5)	7,600 (3.3)	8,900 (3.8)	10,200 (4.4)	16,200 (7.0)
Mar	---	4,100 (1.8)	9,600 (4.2)	11,500 (5.1)	8,300 (3.6)	9,900 (4.4)	11,100 (4.9)	17,000 (7.5)
Apr	---	4,300 (2.3)	9,800 (5.3)	11,700 (6.4)	8,500 (4.6)	10,100 (5.5)	11,300 (6.1)	17,000 (9.2)
May	---	4,600 (2.9)	10,000 (6.4)	11,800 (7.6)	8,700 (5.6)	10,200 (6.5)	11,400 (7.3)	17,000 (10.9)
Jun	---	4,800 (1.8)	10,000 (3.7)	11,800 (4.4)	8,800 (3.3)	10,300 (3.8)	11,400 (4.2)	17,000 (6.3)
Jul	---	5,000 (2.7)	10,100 (5.5)	11,900 (6.5)	8,900 (4.8)	10,400 (5.7)	11,500 (6.3)	16,900 (9.2)
Aug	---	5,200 (2.2)	10,300 (4.3)	12,000 (5.0)	9,100 (3.8)	10,500 (4.3)	11,600 (4.8)	16,900 (7.0)
Sep	---	5,300 (2.5)	10,200 (4.7)	11,900 (5.5)	9,100 (4.2)	10,500 (4.9)	11,600 (5.4)	16,800 (7.8)
Oct	---	5,400 (2.4)	10,400 (4.7)	12,000 (5.4)	9,200 (4.1)	10,600 (4.7)	11,700 (5.2)	16,800 (7.5)
Nov	---	5,300 (1.9)	10,200 (3.7)	11,900 (4.3)	9,100 (3.3)	10,500 (3.8)	11,500 (4.2)	16,600 (6.1)
Dec	---	5,400 (2.0)	10,500 (3.8)	12,200 (4.4)	9,300 (3.4)	10,800 (3.9)	11,800 (4.3)	16,800 (6.1)
Average	---	4,700 (2.1)	9,900 (4.4)	11,700 (5.2)	8,700 (3.9)	10,100 (4.5)	11,300 (5.0)	16,800 (7.5)

Table 73. Monthly Storage Contents Dry Year (2004) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	48,300	54,300	55,100	54,900	55,600	55,200	55,300	53,600
Feb	52,800	58,800	59,600	59,400	60,100	59,700	59,800	58,000
Mar	47,400	53,700	55,800	55,800	55,700	55,900	55,700	54,000
Apr	24,900	32,400	34,200	34,000	34,200	34,400	34,400	32,700
May	21,400	29,100	30,800	30,600	30,900	31,000	31,100	29,400
Jun	20,700	28,100	29,800	29,600	29,900	30,000	30,100	28,500
Jul	23,600	31,100	32,800	32,600	33,000	33,000	33,100	31,400
Aug	35,500	43,200	45,000	44,800	45,200	45,100	45,200	43,500
Sep	33,400	41,100	42,900	42,800	43,200	43,100	43,100	41,400
Oct	32,400	40,200	42,200	42,000	42,300	42,400	42,100	40,300
Nov	43,000	50,700	52,700	52,500	52,800	52,900	52,700	50,800
Dec	54,200	61,900	63,900	63,700	64,000	64,100	63,800	62,000
Average	36,500	43,700	45,400	45,200	45,600	45,600	45,500	43,800
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	800 (1.5)	600 (1.1)	1,300 (2.4)	900 (1.7)	1,000 (1.8)	-700 (-1.3)
Feb	---	---	800 (1.4)	600 (1.0)	1,300 (2.2)	900 (1.5)	1,000 (1.7)	-800 (-1.4)
Mar	---	---	2,100 (3.9)	2,100 (3.9)	2,000 (3.7)	2,200 (4.1)	2,000 (3.7)	300 (0.6)
Apr	---	---	1,800 (5.6)	1,600 (4.9)	1,800 (5.6)	2,000 (6.2)	2,000 (6.2)	300 (0.9)
May	---	---	1,700 (5.8)	1,500 (5.2)	1,800 (6.2)	1,900 (6.5)	2,000 (6.9)	300 (1.0)
Jun	---	---	1,700 (6.0)	1,500 (5.3)	1,800 (6.4)	1,900 (6.8)	2,000 (7.1)	400 (1.4)
Jul	---	---	1,700 (5.5)	1,500 (4.8)	1,900 (6.1)	1,900 (6.1)	2,000 (6.4)	300 (1.0)
Aug	---	---	1,800 (4.2)	1,600 (3.7)	2,000 (4.6)	1,900 (4.4)	2,000 (4.6)	300 (0.7)
Sep	---	---	1,800 (4.4)	1,700 (4.1)	2,100 (5.1)	2,000 (4.9)	2,000 (4.9)	300 (0.7)
Oct	---	---	2,000 (5.0)	1,800 (4.5)	2,100 (5.2)	2,200 (5.5)	1,900 (4.7)	100 (0.2)
Nov	---	---	2,000 (3.9)	1,800 (3.6)	2,100 (4.1)	2,200 (4.3)	2,000 (3.9)	100 (0.2)
Dec	---	---	2,000 (3.2)	1,800 (2.9)	2,100 (3.4)	2,200 (3.6)	1,900 (3.1)	100 (0.2)
Average	---	---	1,700 (3.9)	1,500 (3.4)	1,900 (4.3)	1,900 (4.3)	1,800 (4.1)	100 (0.2)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	6,000 (12.4)	6,800 (14.1)	6,600 (13.7)	7,300 (15.1)	6,900 (14.3)	7,000 (14.5)	5,300 (11.0)
Feb	---	6,000 (11.4)	6,800 (12.9)	6,600 (12.5)	7,300 (13.8)	6,900 (13.1)	7,000 (13.3)	5,200 (9.8)
Mar	---	6,300 (13.3)	8,400 (17.7)	8,400 (17.7)	8,300 (17.5)	8,500 (17.9)	8,300 (17.5)	6,600 (13.9)
Apr	---	7,500 (30.1)	9,300 (37.3)	9,100 (36.5)	9,300 (37.3)	9,500 (38.2)	9,500 (38.2)	7,800 (31.3)
May	---	7,700 (36.0)	9,400 (43.9)	9,200 (43.0)	9,500 (44.4)	9,600 (44.9)	9,700 (45.3)	8,000 (37.4)
Jun	---	7,400 (35.7)	9,100 (44.0)	8,900 (43.0)	9,200 (44.4)	9,300 (44.9)	9,400 (45.4)	7,800 (37.7)
Jul	---	7,500 (31.8)	9,200 (39.0)	9,000 (38.1)	9,400 (39.8)	9,400 (39.8)	9,500 (40.3)	7,800 (33.1)
Aug	---	7,700 (21.7)	9,500 (26.8)	9,300 (26.2)	9,700 (27.3)	9,600 (27.0)	9,700 (27.3)	8,000 (22.5)
Sep	---	7,700 (23.1)	9,500 (28.4)	9,400 (28.1)	9,800 (29.3)	9,700 (29.0)	9,700 (29.0)	8,000 (24.0)
Oct	---	7,800 (24.1)	9,800 (30.2)	9,600 (29.6)	9,900 (30.6)	10,000 (30.9)	9,700 (29.9)	7,900 (24.4)
Nov	---	7,700 (17.9)	9,700 (22.6)	9,500 (22.1)	9,800 (22.8)	9,900 (23.0)	9,700 (22.6)	7,800 (18.1)
Dec	---	7,700 (14.2)	9,700 (17.9)	9,500 (17.5)	9,800 (18.1)	9,900 (18.3)	9,600 (17.7)	7,800 (14.4)
Average	---	7,200 (19.7)	8,900 (24.4)	8,700 (23.8)	9,100 (24.9)	9,100 (24.9)	9,000 (24.7)	7,300 (20.0)

Table 74. Monthly Depth Overall Average – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	44.1	44.7	45.0	45.0	45.0	45.0	45.0	45.0
Feb	46.4	47.0	47.3	47.3	47.3	47.3	47.2	47.2
Mar	47.4	48.2	48.4	48.5	48.5	48.4	48.5	48.4
Apr	45.3	46.2	46.5	46.6	46.5	46.5	46.5	46.5
May	44.4	45.3	45.6	45.6	45.5	45.6	45.6	45.5
Jun	44.9	45.8	46.1	46.1	46.0	46.1	46.1	46.1
Jul	40.2	41.3	41.7	41.7	41.6	41.7	41.7	41.6
Aug	38.9	40.1	40.4	40.5	40.4	40.4	40.4	40.3
Sep	37.1	38.1	38.5	38.5	38.4	38.5	38.5	38.5
Oct	36.9	37.8	38.1	38.2	38.1	38.1	38.1	38.1
Nov	39.2	40.1	40.4	40.4	40.4	40.4	40.4	40.3
Dec	41.6	42.4	42.7	42.7	42.7	42.7	42.7	42.7
Average	42.2	43.1	43.4	43.4	43.4	43.4	43.4	43.3
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.2 (0.5)	0.3 (0.6)	0.2 (0.6)	0.2 (0.6)	0.2 (0.6)	0.2 (0.5)
Feb	---	---	0.2 (0.5)	0.3 (0.6)	0.3 (0.6)	0.2 (0.5)	0.2 (0.5)	0.2 (0.4)
Mar	---	---	0.2 (0.5)	0.3 (0.5)	0.2 (0.5)	0.2 (0.5)	0.3 (0.5)	0.2 (0.4)
Apr	---	---	0.4 (0.8)	0.4 (0.8)	0.3 (0.6)	0.4 (0.8)	0.3 (0.7)	0.3 (0.6)
May	---	---	0.3 (0.8)	0.4 (0.8)	0.3 (0.6)	0.3 (0.8)	0.3 (0.7)	0.3 (0.6)
Jun	---	---	0.3 (0.7)	0.3 (0.7)	0.3 (0.6)	0.3 (0.7)	0.3 (0.7)	0.3 (0.6)
Jul	---	---	0.4 (0.9)	0.4 (0.9)	0.3 (0.7)	0.4 (0.9)	0.4 (0.9)	0.3 (0.7)
Aug	---	---	0.4 (0.9)	0.4 (1.0)	0.3 (0.8)	0.4 (0.9)	0.4 (0.9)	0.3 (0.7)
Sep	---	---	0.3 (0.9)	0.4 (1.0)	0.3 (0.8)	0.3 (0.9)	0.3 (0.9)	0.3 (0.8)
Oct	---	---	0.3 (0.8)	0.4 (0.9)	0.3 (0.8)	0.3 (0.9)	0.3 (0.8)	0.3 (0.7)
Nov	---	---	0.3 (0.8)	0.3 (0.9)	0.3 (0.7)	0.3 (0.8)	0.3 (0.8)	0.3 (0.7)
Dec	---	---	0.3 (0.6)	0.3 (0.7)	0.3 (0.6)	0.3 (0.6)	0.3 (0.6)	0.3 (0.6)
Average	---	---	0.3 (0.7)	0.3 (0.8)	0.3 (0.6)	0.3 (0.7)	0.3 (0.7)	0.3 (0.6)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	0.6 (1.5)	0.9 (2.0)	0.9 (2.1)	0.9 (2.0)	0.9 (2.0)	0.9 (2.0)	0.9 (2.0)
Feb	---	0.6 (1.3)	0.9 (1.9)	0.9 (1.9)	0.9 (1.9)	0.9 (1.9)	0.8 (1.8)	0.8 (1.8)
Mar	---	0.8 (1.7)	1.0 (2.1)	1.0 (2.2)	1.0 (2.2)	1.0 (2.1)	1.0 (2.2)	1.0 (2.0)
Apr	---	0.8 (1.8)	1.2 (2.6)	1.2 (2.7)	1.1 (2.5)	1.2 (2.6)	1.2 (2.6)	1.1 (2.5)
May	---	0.9 (2.0)	1.2 (2.8)	1.2 (2.8)	1.1 (2.6)	1.2 (2.8)	1.2 (2.7)	1.2 (2.6)
Jun	---	0.8 (1.9)	1.2 (2.6)	1.2 (2.6)	1.1 (2.4)	1.2 (2.6)	1.1 (2.5)	1.1 (2.5)
Jul	---	1.1 (2.7)	1.5 (3.6)	1.5 (3.7)	1.4 (3.4)	1.5 (3.7)	1.5 (3.6)	1.4 (3.5)
Aug	---	1.1 (2.9)	1.5 (3.9)	1.5 (4.0)	1.5 (3.8)	1.5 (3.9)	1.5 (3.8)	1.4 (3.7)
Sep	---	1.0 (2.8)	1.4 (3.7)	1.4 (3.8)	1.3 (3.6)	1.4 (3.7)	1.4 (3.7)	1.3 (3.6)
Oct	---	0.9 (2.5)	1.2 (3.4)	1.3 (3.4)	1.2 (3.3)	1.3 (3.4)	1.2 (3.3)	1.2 (3.2)
Nov	---	0.9 (2.2)	1.2 (3.0)	1.2 (3.1)	1.2 (2.9)	1.2 (3.0)	1.2 (3.0)	1.1 (2.9)
Dec	---	0.8 (1.8)	1.0 (2.5)	1.1 (2.5)	1.0 (2.5)	1.0 (2.5)	1.0 (2.5)	1.0 (2.5)
Average	---	0.9 (2.1)	1.2 (2.8)	1.2 (2.9)	1.1 (2.7)	1.2 (2.8)	1.2 (2.8)	1.1 (2.7)

Table 75. Monthly Depth Normal Year (2005) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	35.3	37.0	37.5	37.4	37.5	37.5	37.5	37.0
Feb	39.7	40.9	41.2	41.2	41.2	41.2	41.2	40.9
Mar	41.1	42.2	42.5	42.6	42.6	42.6	42.6	42.2
Apr	43.7	44.8	45.1	45.2	45.2	45.2	45.2	44.8
May	39.3	40.7	41.1	41.1	41.1	41.2	41.1	40.8
Jun	34.8	36.6	37.2	37.2	37.1	37.2	37.1	36.7
Jul	26.1	28.6	29.4	29.4	29.4	29.4	29.4	28.8
Aug	25.8	28.2	29.0	29.0	28.9	29.0	28.9	28.4
Sep	25.5	27.9	28.6	28.7	28.6	28.7	28.6	28.1
Oct	24.6	27.0	27.8	27.8	27.7	27.8	27.7	27.2
Nov	26.5	28.9	29.7	29.7	29.6	29.7	29.6	29.1
Dec	28.9	30.8	31.3	31.4	31.3	31.4	31.3	30.9
Average	32.6	34.5	35.0	35.1	35.0	35.1	35.0	34.6
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.5 (1.3)	0.4 (1.2)	0.5 (1.4)	0.5 (1.5)	0.5 (1.3)	0.0 (0.1)
Feb	---	---	0.3 (0.8)	0.3 (0.8)	0.4 (0.9)	0.4 (0.9)	0.4 (0.9)	0.0 (0.0)
Mar	---	---	0.4 (0.9)	0.4 (0.9)	0.4 (0.9)	0.4 (0.9)	0.4 (0.9)	0.0 (0.1)
Apr	---	---	0.4 (0.8)	0.4 (0.9)	0.4 (0.9)	0.4 (0.9)	0.4 (0.8)	0.0 (0.1)
May	---	---	0.4 (1.0)	0.4 (1.0)	0.4 (0.9)	0.4 (1.0)	0.4 (0.9)	0.1 (0.2)
Jun	---	---	0.5 (1.5)	0.6 (1.6)	0.5 (1.4)	0.6 (1.6)	0.5 (1.4)	0.1 (0.4)
Jul	---	---	0.7 (2.6)	0.8 (2.7)	0.7 (2.5)	0.8 (2.8)	0.7 (2.5)	0.2 (0.6)
Aug	---	---	0.7 (2.5)	0.8 (2.7)	0.7 (2.5)	0.8 (2.8)	0.7 (2.4)	0.2 (0.6)
Sep	---	---	0.7 (2.5)	0.8 (2.7)	0.7 (2.4)	0.8 (2.7)	0.7 (2.4)	0.2 (0.6)
Oct	---	---	0.7 (2.7)	0.8 (2.9)	0.7 (2.5)	0.8 (2.9)	0.7 (2.6)	0.2 (0.6)
Nov	---	---	0.8 (2.6)	0.8 (2.8)	0.7 (2.4)	0.8 (2.8)	0.7 (2.5)	0.2 (0.7)
Dec	---	---	0.5 (1.8)	0.6 (1.9)	0.5 (1.6)	0.6 (1.9)	0.5 (1.7)	0.1 (0.4)
Average	---	---	0.6 (1.6)	0.6 (1.7)	0.5 (1.6)	0.6 (1.7)	0.5 (1.6)	0.1 (0.3)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	1.7 (4.9)	2.2 (6.3)	2.2 (6.1)	2.2 (6.4)	2.3 (6.4)	2.2 (6.2)	1.7 (5.0)
Feb	---	1.2 (3.0)	1.5 (3.8)	1.5 (3.9)	1.6 (4.0)	1.5 (3.9)	1.6 (3.9)	1.2 (3.0)
Mar	---	1.0 (2.5)	1.4 (3.4)	1.4 (3.5)	1.4 (3.5)	1.4 (3.5)	1.4 (3.5)	1.1 (2.6)
Apr	---	1.1 (2.5)	1.4 (3.3)	1.5 (3.4)	1.5 (3.3)	1.5 (3.4)	1.5 (3.3)	1.1 (2.6)
May	---	1.4 (3.6)	1.8 (4.6)	1.8 (4.7)	1.8 (4.6)	1.8 (4.7)	1.8 (4.6)	1.5 (3.8)
Jun	---	1.8 (5.1)	2.3 (6.7)	2.4 (6.8)	2.3 (6.6)	2.4 (6.8)	2.3 (6.6)	1.9 (5.5)
Jul	---	2.5 (9.7)	3.3 (12.5)	3.3 (12.7)	3.2 (12.4)	3.3 (12.7)	3.2 (12.4)	2.7 (10.4)
Aug	---	2.5 (9.6)	3.2 (12.3)	3.2 (12.5)	3.2 (12.3)	3.2 (12.6)	3.2 (12.2)	2.6 (10.3)
Sep	---	2.4 (9.5)	3.1 (12.2)	3.2 (12.4)	3.1 (12.2)	3.2 (12.5)	3.1 (12.1)	2.6 (10.2)
Oct	---	2.4 (9.7)	3.1 (12.7)	3.2 (12.8)	3.1 (12.4)	3.2 (12.9)	3.1 (12.6)	2.6 (10.4)
Nov	---	2.4 (8.9)	3.1 (11.7)	3.2 (11.9)	3.1 (11.5)	3.2 (12.0)	3.1 (11.7)	2.6 (9.6)
Dec	---	1.9 (6.7)	2.5 (8.6)	2.5 (8.7)	2.4 (8.4)	2.5 (8.7)	2.5 (8.5)	2.1 (7.1)
Average	---	1.9 (5.7)	2.4 (7.4)	2.4 (7.5)	2.4 (7.4)	2.5 (7.5)	2.4 (7.4)	2.0 (6.1)

Table 76. Monthly Depth Wet Year (1997) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	58.5	59.0	59.6	59.9	59.5	59.7	59.8	60.5
Feb	61.1	61.4	61.9	62.1	61.8	61.9	62.1	62.7
Mar	60.5	60.9	61.5	61.6	61.3	61.5	61.6	62.2
Apr	55.1	55.7	56.4	56.6	56.2	56.4	56.6	57.3
May	51.6	52.1	52.8	53.1	52.7	52.9	53.0	53.7
Jun	64.6	65.1	65.6	65.8	65.5	65.6	65.7	66.3
Jul	55.1	55.7	56.4	56.6	56.2	56.4	56.6	57.3
Aug	61.9	62.4	62.9	63.1	62.8	63.0	63.1	63.6
Sep	59.0	59.7	60.3	60.4	60.2	60.3	60.4	60.9
Oct	60.1	60.7	61.2	61.3	61.0	61.2	61.3	61.8
Nov	65.1	65.6	66.1	66.3	66.0	66.2	66.3	66.8
Dec	65.3	65.8	66.4	66.5	66.2	66.4	66.5	67.0
Average	59.8	60.3	60.9	61.1	60.8	61.0	61.1	61.7
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.7 (1.2)	0.9 (1.6)	0.5 (0.9)	0.7 (1.2)	0.9 (1.5)	1.5 (2.6)
Feb	---	---	0.5 (0.9)	0.7 (1.2)	0.4 (0.7)	0.6 (0.9)	0.7 (1.1)	1.3 (2.1)
Mar	---	---	0.6 (0.9)	0.7 (1.2)	0.4 (0.7)	0.6 (1.0)	0.7 (1.2)	1.3 (2.1)
Apr	---	---	0.7 (1.3)	0.9 (1.7)	0.5 (1.0)	0.7 (1.3)	0.9 (1.6)	1.6 (2.9)
May	---	---	0.7 (1.3)	0.9 (1.8)	0.5 (1.0)	0.7 (1.4)	0.9 (1.7)	1.6 (3.0)
Jun	---	---	0.5 (0.8)	0.7 (1.1)	0.4 (0.6)	0.5 (0.8)	0.7 (1.0)	1.2 (1.9)
Jul	---	---	0.7 (1.2)	0.9 (1.6)	0.5 (0.9)	0.7 (1.2)	0.8 (1.5)	1.5 (2.7)
Aug	---	---	0.5 (0.8)	0.7 (1.1)	0.4 (0.6)	0.5 (0.8)	0.6 (1.0)	1.2 (1.9)
Sep	---	---	0.6 (0.9)	0.7 (1.2)	0.4 (0.7)	0.6 (1.0)	0.7 (1.2)	1.2 (2.0)
Oct	---	---	0.5 (0.8)	0.7 (1.1)	0.4 (0.6)	0.5 (0.9)	0.6 (1.0)	1.1 (1.9)
Nov	---	---	0.5 (0.7)	0.7 (1.0)	0.4 (0.6)	0.5 (0.8)	0.6 (0.9)	1.1 (1.7)
Dec	---	---	0.5 (0.8)	0.7 (1.0)	0.4 (0.6)	0.5 (0.8)	0.6 (1.0)	1.1 (1.7)
Average	---	---	0.6 (0.9)	0.8 (1.3)	0.4 (0.7)	0.6 (1.0)	0.7 (1.2)	1.3 (2.2)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	0.4 (0.7)	1.1 (1.9)	1.4 (2.3)	1.0 (1.7)	1.2 (2.0)	1.3 (2.2)	1.9 (3.3)
Feb	---	0.3 (0.5)	0.9 (1.4)	1.1 (1.7)	0.8 (1.2)	0.9 (1.5)	1.0 (1.7)	1.6 (2.7)
Mar	---	0.4 (0.7)	1.0 (1.6)	1.1 (1.9)	0.8 (1.4)	1.0 (1.6)	1.1 (1.8)	1.7 (2.8)
Apr	---	0.5 (1.0)	1.2 (2.3)	1.5 (2.7)	1.1 (2.0)	1.3 (2.3)	1.4 (2.6)	2.2 (3.9)
May	---	0.6 (1.1)	1.3 (2.5)	1.5 (2.9)	1.1 (2.1)	1.3 (2.5)	1.5 (2.8)	2.2 (4.2)
Jun	---	0.5 (0.7)	1.0 (1.5)	1.2 (1.8)	0.9 (1.4)	1.0 (1.6)	1.1 (1.8)	1.7 (2.6)
Jul	---	0.6 (1.2)	1.3 (2.3)	1.5 (2.7)	1.1 (2.1)	1.3 (2.4)	1.5 (2.7)	2.2 (3.9)
Aug	---	0.5 (0.8)	1.0 (1.6)	1.2 (1.9)	0.9 (1.5)	1.0 (1.7)	1.2 (1.9)	1.7 (2.7)
Sep	---	0.7 (1.2)	1.2 (2.1)	1.4 (2.4)	1.1 (1.9)	1.3 (2.1)	1.4 (2.3)	1.9 (3.2)
Oct	---	0.5 (0.9)	1.0 (1.7)	1.2 (2.0)	0.9 (1.5)	1.1 (1.7)	1.2 (1.9)	1.7 (2.8)
Nov	---	0.5 (0.8)	1.0 (1.6)	1.2 (1.8)	0.9 (1.4)	1.0 (1.6)	1.1 (1.8)	1.7 (2.5)
Dec	---	0.5 (0.8)	1.1 (1.6)	1.2 (1.9)	0.9 (1.4)	1.1 (1.6)	1.2 (1.8)	1.7 (2.6)
Average	---	0.5 (0.9)	1.1 (1.8)	1.3 (2.1)	1.0 (1.6)	1.1 (1.9)	1.2 (2.1)	1.8 (3.1)

Table 77. Monthly Depth Dry Year (2004) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions		No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Depth (ft)																
Jan	30.5		32.0		32.2		32.2		32.3		32.2		32.3		31.8	
Feb	31.6		33.1		33.3		33.3		33.4		33.3		33.4		32.9	
Mar	30.3		31.9		32.4		32.4		32.4		32.4		32.4		31.9	
Apr	22.7		25.3		25.9		25.8		25.9		26.0		26.0		25.4	
May	21.5		24.1		24.7		24.7		24.8		24.8		24.8		24.2	
Jun	21.2		23.8		24.4		24.3		24.4		24.5		24.5		23.9	
Jul	22.2		24.8		25.4		25.4		25.5		25.5		25.5		24.9	
Aug	26.3		29.0		29.6		29.6		29.7		29.7		29.7		29.1	
Sep	25.6		28.3		28.9		28.9		29.0		29.0		29.0		28.4	
Oct	25.3		28.0		28.7		28.6		28.7		28.7		28.6		28.0	
Nov	29.0		31.1		31.6		31.6		31.7		31.7		31.6		31.1	
Dec	32.0		33.9		34.4		34.3		34.4		34.4		34.4		33.9	
Average	26.5		28.8		29.3		29.3		29.4		29.4		29.3		28.8	
Change in Depth Compared to No Action [ft (%)]																
Jan	---		---		0.2	(0.6)	0.2	(0.5)	0.3	(1.0)	0.2	(0.7)	0.2	(0.8)	-0.2	(-0.6)
Feb	---		---		0.2	(0.6)	0.2	(0.5)	0.3	(1.0)	0.2	(0.7)	0.3	(0.8)	-0.2	(-0.6)
Mar	---		---		0.5	(1.7)	0.5	(1.7)	0.5	(1.6)	0.6	(1.7)	0.5	(1.6)	0.1	(0.2)
Apr	---		---		0.6	(2.4)	0.6	(2.2)	0.6	(2.5)	0.7	(2.8)	0.7	(2.8)	0.1	(0.5)
May	---		---		0.6	(2.5)	0.5	(2.2)	0.6	(2.6)	0.7	(2.8)	0.7	(2.9)	0.1	(0.5)
Jun	---		---		0.6	(2.4)	0.5	(2.2)	0.6	(2.5)	0.7	(2.8)	0.7	(2.8)	0.1	(0.5)
Jul	---		---		0.6	(2.4)	0.5	(2.1)	0.6	(2.6)	0.7	(2.7)	0.7	(2.8)	0.1	(0.4)
Aug	---		---		0.6	(2.1)	0.6	(1.9)	0.7	(2.4)	0.6	(2.2)	0.7	(2.4)	0.1	(0.3)
Sep	---		---		0.6	(2.2)	0.6	(2.0)	0.7	(2.5)	0.7	(2.4)	0.7	(2.4)	0.1	(0.3)
Oct	---		---		0.7	(2.5)	0.6	(2.3)	0.7	(2.7)	0.8	(2.7)	0.7	(2.4)	0.0	(0.2)
Nov	---		---		0.5	(1.6)	0.5	(1.5)	0.5	(1.7)	0.6	(1.8)	0.5	(1.6)	0.0	(0.1)
Dec	---		---		0.5	(1.5)	0.5	(1.3)	0.5	(1.6)	0.5	(1.6)	0.5	(1.4)	0.0	(0.1)
Average	---		---		0.5	(1.8)	0.5	(1.6)	0.6	(2.0)	0.6	(2.0)	0.6	(2.0)	0.0	(0.1)
Change in Depth Compared to Existing Conditions [ft (%)]																
Jan	---		1.5	(4.9)	1.7	(5.5)	1.6	(5.4)	1.8	(5.9)	1.7	(5.6)	1.7	(5.7)	1.3	(4.3)
Feb	---		1.5	(4.7)	1.7	(5.3)	1.6	(5.2)	1.8	(5.7)	1.7	(5.4)	1.7	(5.5)	1.3	(4.1)
Mar	---		1.6	(5.1)	2.1	(6.9)	2.1	(6.9)	2.1	(6.8)	2.1	(7.0)	2.1	(6.8)	1.6	(5.4)
Apr	---		2.6	(11.3)	3.2	(14.0)	3.1	(13.8)	3.2	(14.2)	3.3	(14.4)	3.3	(14.5)	2.7	(11.9)
May	---		2.6	(12.3)	3.2	(15.0)	3.2	(14.8)	3.3	(15.2)	3.3	(15.4)	3.3	(15.5)	2.8	(12.8)
Jun	---		2.6	(12.1)	3.1	(14.8)	3.1	(14.5)	3.2	(14.9)	3.2	(15.2)	3.2	(15.3)	2.7	(12.6)
Jul	---		2.6	(11.7)	3.2	(14.3)	3.1	(14.1)	3.2	(14.6)	3.3	(14.7)	3.3	(14.8)	2.7	(12.2)
Aug	---		2.7	(10.2)	3.3	(12.5)	3.2	(12.3)	3.4	(12.8)	3.3	(12.6)	3.4	(12.8)	2.8	(10.5)
Sep	---		2.7	(10.4)	3.3	(12.8)	3.2	(12.6)	3.4	(13.1)	3.3	(13.0)	3.3	(13.1)	2.8	(10.7)
Oct	---		2.7	(10.6)	3.4	(13.3)	3.3	(13.1)	3.4	(13.5)	3.4	(13.6)	3.3	(13.2)	2.7	(10.7)
Nov	---		2.2	(7.5)	2.7	(9.2)	2.6	(9.0)	2.7	(9.3)	2.7	(9.4)	2.7	(9.2)	2.2	(7.6)
Dec	---		1.9	(6.0)	2.4	(7.5)	2.4	(7.4)	2.4	(7.6)	2.5	(7.7)	2.4	(7.5)	1.9	(6.1)
Average	---		2.2	(8.5)	2.8	(10.4)	2.7	(10.3)	2.8	(10.6)	2.8	(10.6)	2.8	(10.6)	2.3	(8.6)

Table 78. Monthly Surface Area Overall Average – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	5,976.6	6,037.2	6,067.4	6,074.5	6,070.6	6,068.6	6,070.9	6,086.7
Feb	6,318.0	6,395.8	6,430.4	6,437.6	6,438.5	6,431.2	6,429.9	6,432.9
Mar	6,454.8	6,580.7	6,612.1	6,618.4	6,622.9	6,612.5	6,622.5	6,615.8
Apr	6,162.3	6,273.5	6,329.9	6,334.1	6,318.1	6,331.2	6,328.6	6,333.5
May	6,045.1	6,163.6	6,215.3	6,220.1	6,197.4	6,215.7	6,212.6	6,217.2
Jun	6,234.0	6,334.6	6,380.9	6,385.1	6,365.1	6,381.1	6,380.5	6,395.8
Jul	5,460.5	5,592.1	5,641.0	5,646.2	5,627.8	5,641.8	5,643.4	5,648.1
Aug	5,189.9	5,373.6	5,420.7	5,427.6	5,416.1	5,422.6	5,422.0	5,423.3
Sep	4,907.5	5,036.7	5,085.6	5,090.5	5,071.3	5,088.8	5,089.0	5,098.1
Oct	4,873.8	4,977.9	5,020.8	5,025.6	5,018.5	5,023.7	5,023.2	5,028.5
Nov	5,208.7	5,335.3	5,383.8	5,391.6	5,376.3	5,385.4	5,387.7	5,401.0
Dec	5,594.2	5,681.0	5,716.5	5,726.0	5,720.1	5,718.6	5,725.7	5,748.8
Average	5,702.1	5,815.2	5,858.7	5,864.8	5,853.6	5,860.1	5,861.3	5,869.1
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	30.2 (0.5)	37.3 (0.6)	33.4 (0.6)	31.4 (0.5)	33.7 (0.6)	49.5 (0.8)
Feb	---	---	34.7 (0.5)	41.8 (0.7)	42.8 (0.7)	35.4 (0.6)	34.1 (0.5)	37.1 (0.6)
Mar	---	---	31.4 (0.5)	37.7 (0.6)	42.2 (0.6)	31.8 (0.5)	41.8 (0.6)	35.1 (0.5)
Apr	---	---	56.4 (0.9)	60.6 (1.0)	44.6 (0.7)	57.7 (0.9)	55.2 (0.9)	60.0 (1.0)
May	---	---	51.7 (0.8)	56.5 (0.9)	33.8 (0.5)	52.1 (0.8)	49.0 (0.8)	53.6 (0.9)
Jun	---	---	46.2 (0.7)	50.5 (0.8)	30.5 (0.5)	46.4 (0.7)	45.9 (0.7)	61.2 (1.0)
Jul	---	---	48.9 (0.9)	54.1 (1.0)	35.7 (0.6)	49.7 (0.9)	51.3 (0.9)	56.0 (1.0)
Aug	---	---	47.1 (0.9)	54.0 (1.0)	42.5 (0.8)	49.0 (0.9)	48.4 (0.9)	49.7 (0.9)
Sep	---	---	48.9 (1.0)	53.8 (1.1)	34.6 (0.7)	52.1 (1.0)	52.3 (1.0)	61.4 (1.2)
Oct	---	---	42.8 (0.9)	47.6 (1.0)	40.5 (0.8)	45.7 (0.9)	45.3 (0.9)	50.5 (1.0)
Nov	---	---	48.5 (0.9)	56.3 (1.1)	41.0 (0.8)	50.2 (0.9)	52.4 (1.0)	65.7 (1.2)
Dec	---	---	35.6 (0.6)	45.1 (0.8)	39.1 (0.7)	37.7 (0.7)	44.8 (0.8)	67.9 (1.2)
Average	---	---	43.5 (0.7)	49.6 (0.9)	38.4 (0.7)	44.9 (0.8)	46.2 (0.8)	54.0 (0.9)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	60.6 (1.0)	90.8 (1.5)	97.9 (1.6)	94.0 (1.6)	92.0 (1.5)	94.2 (1.6)	110.0 (1.8)
Feb	---	77.8 (1.2)	112.5 (1.8)	119.6 (1.9)	120.5 (1.9)	113.2 (1.8)	111.9 (1.8)	114.9 (1.8)
Mar	---	125.9 (2.0)	157.3 (2.4)	163.6 (2.5)	168.1 (2.6)	157.7 (2.4)	167.7 (2.6)	161.0 (2.5)
Apr	---	111.2 (1.8)	167.6 (2.7)	171.8 (2.8)	155.7 (2.5)	168.8 (2.7)	166.3 (2.7)	171.2 (2.8)
May	---	118.5 (2.0)	170.2 (2.8)	175.0 (2.9)	152.3 (2.5)	170.6 (2.8)	167.5 (2.8)	172.1 (2.8)
Jun	---	100.6 (1.6)	146.9 (2.4)	151.2 (2.4)	131.1 (2.1)	147.1 (2.4)	146.5 (2.4)	161.8 (2.6)
Jul	---	131.6 (2.4)	180.5 (3.3)	185.7 (3.4)	167.2 (3.1)	181.2 (3.3)	182.9 (3.3)	187.5 (3.4)
Aug	---	183.6 (3.5)	230.8 (4.4)	237.7 (4.6)	226.2 (4.4)	232.7 (4.5)	232.1 (4.5)	233.3 (4.5)
Sep	---	129.2 (2.6)	178.1 (3.6)	183.0 (3.7)	163.8 (3.3)	181.3 (3.7)	181.5 (3.7)	190.7 (3.9)
Oct	---	104.1 (2.1)	146.9 (3.0)	151.7 (3.1)	144.7 (3.0)	149.8 (3.1)	149.4 (3.1)	154.6 (3.2)
Nov	---	126.6 (2.4)	175.1 (3.4)	182.9 (3.5)	167.6 (3.2)	176.7 (3.4)	179.0 (3.4)	192.3 (3.7)
Dec	---	86.8 (1.6)	122.3 (2.2)	131.8 (2.4)	125.9 (2.3)	124.4 (2.2)	131.5 (2.4)	154.6 (2.8)
Average	---	113.0 (2.0)	156.6 (2.7)	162.7 (2.9)	151.4 (2.7)	158.0 (2.8)	159.2 (2.8)	167.0 (2.9)

Table 79. Monthly Surface Area Normal Year (2005) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,003.6	4,260.7	4,328.2	4,321.4	4,331.9	4,334.4	4,325.7	4,264.8
Feb	4,654.7	4,885.2	4,943.3	4,949.0	4,956.3	4,950.7	4,952.7	4,885.0
Mar	4,934.9	5,145.7	5,234.2	5,241.8	5,241.3	5,242.4	5,240.5	5,155.6
Apr	5,528.8	5,754.6	5,826.1	5,832.6	5,832.2	5,833.1	5,831.5	5,762.3
May	4,567.8	4,862.0	4,932.9	4,937.9	4,930.4	4,939.4	4,929.8	4,879.0
Jun	3,934.7	4,211.2	4,283.9	4,288.8	4,281.5	4,290.3	4,281.0	4,229.1
Jul	2,853.1	3,385.0	3,480.6	3,483.7	3,479.1	3,484.5	3,478.8	3,422.4
Aug	2,803.0	3,300.9	3,447.2	3,456.9	3,442.4	3,457.8	3,441.3	3,337.5
Sep	2,777.3	3,237.7	3,381.0	3,390.5	3,376.3	3,393.3	3,375.2	3,273.3
Oct	2,712.6	3,060.2	3,205.5	3,214.8	3,195.0	3,217.7	3,201.6	3,094.8
Nov	2,947.3	3,436.8	3,497.4	3,500.2	3,493.4	3,501.1	3,496.1	3,462.5
Dec	3,430.5	3,589.3	3,639.7	3,642.9	3,635.3	3,643.8	3,638.3	3,601.1
Average	3,762.3	4,094.1	4,183.3	4,188.4	4,182.9	4,190.7	4,182.7	4,114.0
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	67.5 (1.6)	60.7 (1.4)	71.2 (1.7)	73.7 (1.7)	65.0 (1.5)	4.1 (0.1)
Feb	---	---	58.1 (1.2)	63.8 (1.3)	71.0 (1.5)	65.4 (1.3)	67.4 (1.4)	-0.2 (0.0)
Mar	---	---	88.5 (1.7)	96.1 (1.9)	95.6 (1.9)	96.7 (1.9)	94.8 (1.8)	9.9 (0.2)
Apr	---	---	71.4 (1.2)	77.9 (1.4)	77.5 (1.3)	78.4 (1.4)	76.8 (1.3)	7.7 (0.1)
May	---	---	70.9 (1.5)	75.9 (1.6)	68.4 (1.4)	77.4 (1.6)	67.9 (1.4)	17.0 (0.4)
Jun	---	---	72.8 (1.7)	77.7 (1.8)	70.3 (1.7)	79.1 (1.9)	69.8 (1.7)	18.0 (0.4)
Jul	---	---	95.7 (2.8)	98.7 (2.9)	94.2 (2.8)	99.6 (2.9)	93.8 (2.8)	37.5 (1.1)
Aug	---	---	146.3 (4.4)	156.0 (4.7)	141.5 (4.3)	156.9 (4.8)	140.4 (4.3)	36.6 (1.1)
Sep	---	---	143.3 (4.4)	152.8 (4.7)	138.5 (4.3)	155.6 (4.8)	137.4 (4.2)	35.6 (1.1)
Oct	---	---	145.3 (4.7)	154.6 (5.1)	134.8 (4.4)	157.5 (5.1)	141.4 (4.6)	34.6 (1.1)
Nov	---	---	60.6 (1.8)	63.5 (1.8)	56.6 (1.6)	64.3 (1.9)	59.4 (1.7)	25.7 (0.7)
Dec	---	---	50.4 (1.4)	53.7 (1.5)	46.0 (1.3)	54.5 (1.5)	49.0 (1.4)	11.8 (0.3)
Average	---	---	89.2 (2.2)	94.3 (2.3)	88.8 (2.2)	96.6 (2.4)	88.6 (2.2)	19.8 (0.5)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	257.1 (6.4)	324.6 (8.1)	317.9 (7.9)	328.3 (8.2)	330.8 (8.3)	322.1 (8.0)	261.2 (6.5)
Feb	---	230.6 (5.0)	288.7 (6.2)	294.3 (6.3)	301.6 (6.5)	296.0 (6.4)	298.0 (6.4)	230.4 (4.9)
Mar	---	210.8 (4.3)	299.3 (6.1)	306.9 (6.2)	306.5 (6.2)	307.5 (6.2)	305.6 (6.2)	220.7 (4.5)
Apr	---	225.8 (4.1)	297.2 (5.4)	303.7 (5.5)	303.3 (5.5)	304.2 (5.5)	302.6 (5.5)	233.5 (4.2)
May	---	294.2 (6.4)	365.1 (8.0)	370.1 (8.1)	362.6 (7.9)	371.6 (8.1)	362.0 (7.9)	311.2 (6.8)
Jun	---	276.4 (7.0)	349.2 (8.9)	354.1 (9.0)	346.8 (8.8)	355.6 (9.0)	346.2 (8.8)	294.4 (7.5)
Jul	---	531.9 (18.6)	627.6 (22.0)	630.6 (22.1)	626.1 (21.9)	631.5 (22.1)	625.7 (21.9)	569.4 (20.0)
Aug	---	498.0 (17.8)	644.2 (23.0)	653.9 (23.3)	639.4 (22.8)	654.9 (23.4)	638.3 (22.8)	534.6 (19.1)
Sep	---	460.4 (16.6)	603.7 (21.7)	613.2 (22.1)	598.9 (21.6)	616.0 (22.2)	597.8 (21.5)	496.0 (17.9)
Oct	---	347.6 (12.8)	493.0 (18.2)	502.2 (18.5)	482.4 (17.8)	505.1 (18.6)	489.0 (18.0)	382.2 (14.1)
Nov	---	489.5 (16.6)	550.1 (18.7)	553.0 (18.8)	546.1 (18.5)	553.8 (18.8)	548.9 (18.6)	515.2 (17.5)
Dec	---	158.8 (4.6)	209.3 (6.1)	212.5 (6.2)	204.8 (6.0)	213.3 (6.2)	207.8 (6.1)	170.7 (5.0)
Average	---	331.8 (8.8)	421.0 (11.2)	426.0 (11.3)	420.6 (11.2)	428.4 (11.4)	420.4 (11.2)	351.6 (9.3)

Table 80. Monthly Surface Area Wet Year (1997) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	8,596.0	8,686.8	8,820.0	8,868.4	8,794.1	8,828.0	8,859.5	8,994.1
Feb	9,117.0	9,168.1	9,249.7	9,286.2	9,233.6	9,254.6	9,278.5	9,407.8
Mar	8,999.4	9,087.9	9,179.4	9,208.8	9,159.4	9,184.0	9,202.7	9,303.1
Apr	7,867.9	7,971.6	8,114.1	8,166.7	8,078.2	8,122.3	8,155.7	8,318.6
May	7,048.8	7,141.0	7,253.5	7,301.9	7,226.9	7,259.6	7,286.4	7,511.5
Jun	9,876.5	9,984.9	10,076.4	10,108.2	10,054.8	10,081.4	10,101.6	10,269.1
Jul	7,862.9	7,983.4	8,117.5	8,166.8	8,084.3	8,125.2	8,156.5	8,309.8
Aug	9,249.4	9,356.1	9,463.9	9,505.1	9,438.8	9,469.7	9,496.0	9,629.3
Sep	8,703.0	8,834.8	8,949.5	8,987.0	8,924.3	8,955.4	8,979.1	9,092.7
Oct	8,917.2	9,034.0	9,132.4	9,158.3	9,115.1	9,136.4	9,152.5	9,230.5
Nov	9,991.9	10,085.0	10,205.4	10,275.7	10,159.3	10,216.4	10,259.3	10,470.2
Dec	10,024.9	10,120.0	10,297.2	10,367.4	10,244.7	10,308.0	10,347.9	10,559.8
Average	8,854.6	8,954.5	9,071.6	9,116.7	9,042.8	9,078.4	9,106.3	9,258.0
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	133.3 (1.5)	181.6 (2.1)	107.3 (1.2)	141.3 (1.6)	172.7 (2.0)	307.3 (3.5)
Feb	---	---	81.5 (0.9)	118.1 (1.3)	65.5 (0.7)	86.5 (0.9)	110.4 (1.2)	239.7 (2.6)
Mar	---	---	91.5 (1.0)	120.9 (1.3)	71.4 (0.8)	96.1 (1.1)	114.7 (1.3)	215.1 (2.4)
Apr	---	---	142.5 (1.8)	195.1 (2.4)	106.6 (1.3)	150.7 (1.9)	184.1 (2.3)	347.0 (4.4)
May	---	---	112.5 (1.6)	160.9 (2.3)	85.9 (1.2)	118.6 (1.7)	145.5 (2.0)	370.5 (5.2)
Jun	---	---	91.6 (0.9)	123.3 (1.2)	69.9 (0.7)	96.5 (1.0)	116.7 (1.2)	284.2 (2.8)
Jul	---	---	134.1 (1.7)	183.4 (2.3)	100.8 (1.3)	141.8 (1.8)	173.1 (2.2)	326.4 (4.1)
Aug	---	---	107.8 (1.2)	149.0 (1.6)	82.6 (0.9)	113.6 (1.2)	139.8 (1.5)	273.2 (2.9)
Sep	---	---	114.7 (1.3)	152.2 (1.7)	89.5 (1.0)	120.6 (1.4)	144.3 (1.6)	257.9 (2.9)
Oct	---	---	98.3 (1.1)	124.3 (1.4)	81.0 (0.9)	102.4 (1.1)	118.4 (1.3)	196.4 (2.2)
Nov	---	---	120.4 (1.2)	190.7 (1.9)	74.3 (0.7)	131.4 (1.3)	174.3 (1.7)	385.2 (3.8)
Dec	---	---	177.2 (1.8)	247.4 (2.4)	124.7 (1.2)	188.0 (1.9)	227.9 (2.3)	439.8 (4.3)
Average	---	---	117.1 (1.3)	162.2 (1.8)	88.3 (1.0)	124.0 (1.4)	151.8 (1.7)	303.6 (3.4)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	90.8 (1.1)	224.0 (2.6)	272.4 (3.2)	198.1 (2.3)	232.0 (2.7)	263.5 (3.1)	398.1 (4.6)
Feb	---	51.1 (0.6)	132.6 (1.5)	169.2 (1.9)	116.6 (1.3)	137.6 (1.5)	161.5 (1.8)	290.7 (3.2)
Mar	---	88.5 (1.0)	180.0 (2.0)	209.4 (2.3)	160.0 (1.8)	184.6 (2.1)	203.2 (2.3)	303.7 (3.4)
Apr	---	103.7 (1.3)	246.2 (3.1)	298.8 (3.8)	210.3 (2.7)	254.4 (3.2)	287.8 (3.7)	450.7 (5.7)
May	---	92.1 (1.3)	204.7 (2.9)	253.0 (3.6)	178.0 (2.5)	210.8 (3.0)	237.6 (3.4)	462.6 (6.6)
Jun	---	108.4 (1.1)	199.9 (2.0)	231.7 (2.3)	178.3 (1.8)	204.9 (2.1)	225.0 (2.3)	392.6 (4.0)
Jul	---	120.5 (1.5)	254.6 (3.2)	303.9 (3.9)	221.4 (2.8)	262.3 (3.3)	293.6 (3.7)	446.9 (5.7)
Aug	---	106.8 (1.2)	214.6 (2.3)	255.8 (2.8)	189.4 (2.0)	220.4 (2.4)	246.6 (2.7)	380.0 (4.1)
Sep	---	131.8 (1.5)	246.5 (2.8)	283.9 (3.3)	221.2 (2.5)	252.3 (2.9)	276.1 (3.2)	389.7 (4.5)
Oct	---	116.9 (1.3)	215.2 (2.4)	241.1 (2.7)	197.9 (2.2)	219.3 (2.5)	235.3 (2.6)	313.3 (3.5)
Nov	---	93.1 (0.9)	213.5 (2.1)	283.8 (2.8)	167.5 (1.7)	224.5 (2.2)	267.4 (2.7)	478.3 (4.8)
Dec	---	95.1 (0.9)	272.3 (2.7)	342.5 (3.4)	219.8 (2.2)	283.1 (2.8)	323.0 (3.2)	534.9 (5.3)
Average	---	99.9 (1.1)	217.0 (2.5)	262.1 (3.0)	188.2 (2.1)	223.9 (2.5)	251.7 (2.8)	403.5 (4.6)

Table 81. Monthly Surface Area Dry Year (2004) – John Martin Reservoir (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,565.4	3,702.7	3,713.0	3,710.9	3,719.3	3,714.2	3,715.7	3,685.8
Feb	3,667.8	3,762.5	3,775.8	3,773.1	3,783.9	3,777.3	3,779.3	3,751.0
Mar	3,545.6	3,688.3	3,722.5	3,722.1	3,721.5	3,723.5	3,720.8	3,695.7
Apr	2,588.9	2,755.9	2,814.5	2,808.8	2,817.5	2,822.7	2,824.3	2,767.0
May	2,477.2	2,689.1	2,716.3	2,713.7	2,717.8	2,720.2	2,720.9	2,694.3
Jun	2,436.4	2,667.5	2,700.7	2,698.1	2,702.1	2,704.4	2,705.1	2,676.4
Jul	2,568.2	2,721.4	2,769.4	2,764.0	2,774.8	2,776.3	2,778.8	2,726.2
Aug	2,904.0	3,458.6	3,497.1	3,493.4	3,501.3	3,498.8	3,501.6	3,464.7
Sep	2,791.1	3,315.2	3,441.8	3,429.8	3,457.8	3,452.4	3,456.3	3,334.2
Oct	2,757.7	3,246.7	3,390.2	3,376.0	3,398.0	3,403.2	3,384.9	3,255.2
Nov	3,447.9	3,618.0	3,666.4	3,661.6	3,669.0	3,670.7	3,664.6	3,620.9
Dec	3,700.6	3,813.9	3,875.3	3,868.5	3,879.0	3,881.5	3,872.8	3,815.9
Average	3,037.6	3,286.6	3,340.3	3,335.0	3,345.2	3,345.4	3,343.8	3,290.6
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	10.3 (0.3)	8.2 (0.2)	16.6 (0.4)	11.4 (0.3)	13.0 (0.4)	-16.9 (-0.5)
Feb	---	---	13.3 (0.4)	10.6 (0.3)	21.4 (0.6)	14.8 (0.4)	16.8 (0.4)	-11.5 (-0.3)
Mar	---	---	34.1 (0.9)	33.8 (0.9)	33.2 (0.9)	35.1 (1.0)	32.4 (0.9)	7.3 (0.2)
Apr	---	---	58.7 (2.1)	53.0 (1.9)	61.7 (2.2)	66.8 (2.4)	68.4 (2.5)	11.1 (0.4)
May	---	---	27.2 (1.0)	24.6 (0.9)	28.6 (1.1)	31.1 (1.2)	31.8 (1.2)	5.2 (0.2)
Jun	---	---	33.2 (1.2)	30.6 (1.1)	34.6 (1.3)	36.9 (1.4)	37.7 (1.4)	8.9 (0.3)
Jul	---	---	48.0 (1.8)	42.6 (1.6)	53.5 (2.0)	54.9 (2.0)	57.4 (2.1)	4.9 (0.2)
Aug	---	---	38.5 (1.1)	34.8 (1.0)	42.7 (1.2)	40.2 (1.2)	43.0 (1.2)	6.0 (0.2)
Sep	---	---	126.7 (3.8)	114.7 (3.5)	142.6 (4.3)	137.2 (4.1)	141.1 (4.3)	19.0 (0.6)
Oct	---	---	143.5 (4.4)	129.3 (4.0)	151.3 (4.7)	156.5 (4.8)	138.2 (4.3)	8.6 (0.3)
Nov	---	---	48.4 (1.3)	43.6 (1.2)	50.9 (1.4)	52.7 (1.5)	46.6 (1.3)	2.9 (0.1)
Dec	---	---	61.4 (1.6)	54.6 (1.4)	65.2 (1.7)	67.7 (1.8)	58.9 (1.5)	2.0 (0.1)
Average	---	---	53.6 (1.6)	48.4 (1.5)	58.5 (1.8)	58.8 (1.8)	57.1 (1.7)	4.0 (0.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	137.3 (3.9)	147.6 (4.1)	145.5 (4.1)	153.9 (4.3)	148.8 (4.2)	150.3 (4.2)	120.4 (3.4)
Feb	---	94.7 (2.6)	108.0 (2.9)	105.3 (2.9)	116.1 (3.2)	109.5 (3.0)	111.5 (3.0)	83.2 (2.3)
Mar	---	142.8 (4.0)	176.9 (5.0)	176.6 (5.0)	175.9 (5.0)	177.9 (5.0)	175.2 (4.9)	150.1 (4.2)
Apr	---	166.9 (6.4)	225.6 (8.7)	219.9 (8.5)	228.6 (8.8)	233.8 (9.0)	235.3 (9.1)	178.0 (6.9)
May	---	211.9 (8.6)	239.2 (9.7)	236.5 (9.5)	240.6 (9.7)	243.0 (9.8)	243.7 (9.8)	217.1 (8.8)
Jun	---	231.1 (9.5)	264.3 (10.8)	261.7 (10.7)	265.7 (10.9)	268.0 (11.0)	268.7 (11.0)	240.0 (9.8)
Jul	---	153.2 (6.0)	201.2 (7.8)	195.8 (7.6)	206.6 (8.0)	208.1 (8.1)	210.6 (8.2)	158.0 (6.2)
Aug	---	554.6 (19.1)	593.1 (20.4)	589.4 (20.3)	597.3 (20.6)	594.7 (20.5)	597.6 (20.6)	560.6 (19.3)
Sep	---	524.1 (18.8)	650.7 (23.3)	638.7 (22.9)	666.7 (23.9)	661.3 (23.7)	665.2 (23.8)	543.1 (19.5)
Oct	---	489.0 (17.7)	632.5 (22.9)	618.3 (22.4)	640.3 (23.2)	645.5 (23.4)	627.2 (22.7)	497.5 (18.0)
Nov	---	170.1 (4.9)	218.4 (6.3)	213.7 (6.2)	221.0 (6.4)	222.8 (6.5)	216.7 (6.3)	173.0 (5.0)
Dec	---	113.2 (3.1)	174.7 (4.7)	167.9 (4.5)	178.4 (4.8)	180.9 (4.9)	172.1 (4.7)	115.3 (3.1)
Average	---	249.1 (8.2)	302.7 (10.0)	297.4 (9.8)	307.6 (10.1)	307.8 (10.1)	306.2 (10.1)	253.0 (8.3)

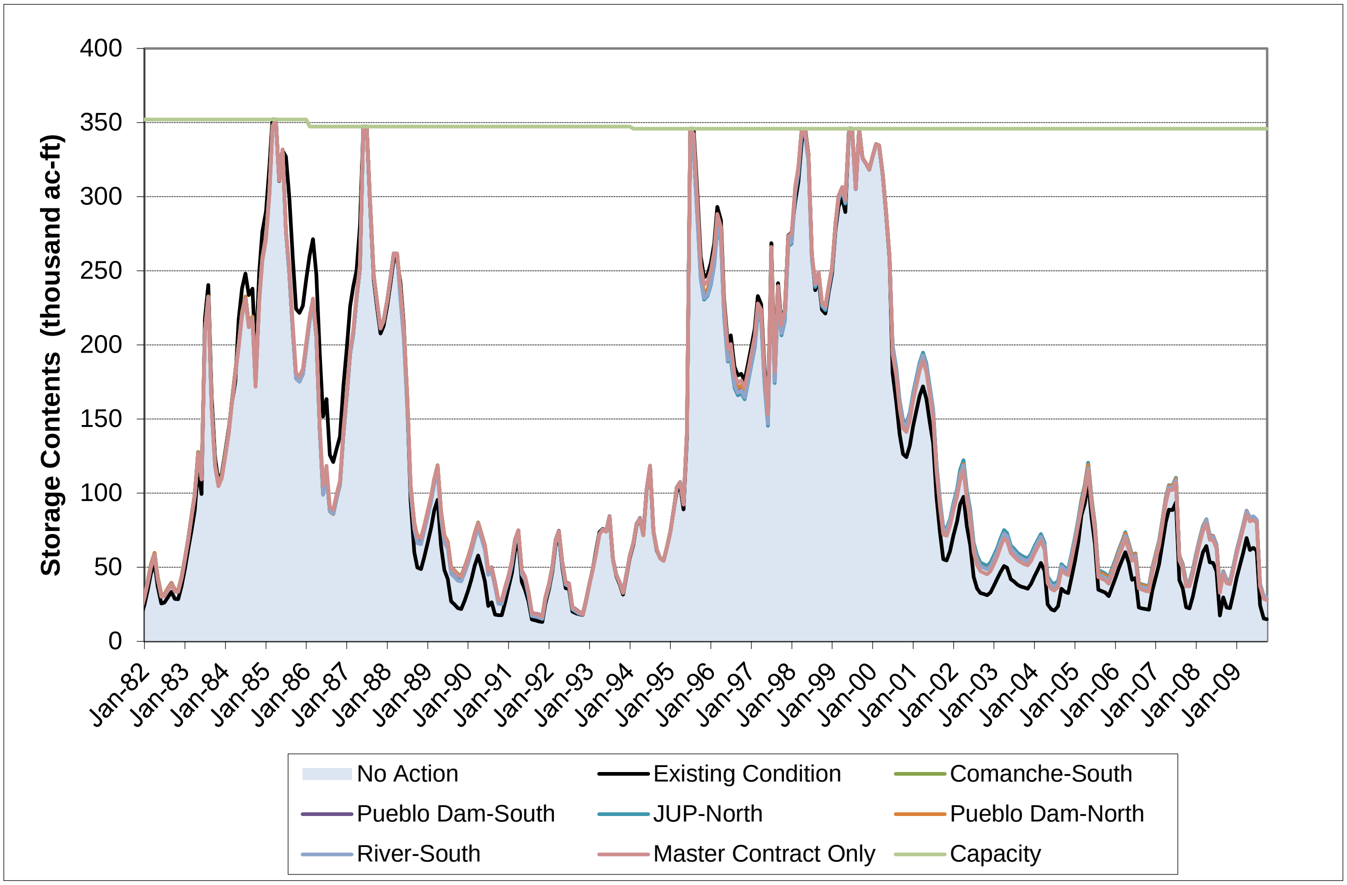


Figure 24. **Storage Contents Time Series – John Martin Reservoir (Cumulative Effects)**

Table 82. Monthly Storage Contents Overall Average – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	131,900	135,200	136,200	136,400	136,000	136,400	135,300	135,700
Feb	144,700	148,500	149,700	149,900	149,500	149,900	148,700	149,000
Mar	149,100	154,300	155,400	155,500	155,200	155,500	154,400	154,800
Apr	137,900	141,300	142,400	142,400	141,900	142,400	141,100	141,800
May	134,800	139,400	140,300	140,300	139,900	140,300	139,200	139,800
Jun	142,100	144,600	145,600	145,700	145,200	145,700	144,600	145,000
Jul	117,500	120,200	121,000	121,100	120,800	121,100	120,100	120,900
Aug	109,600	112,800	113,700	113,800	113,400	113,800	112,800	113,400
Sep	98,000	101,100	102,000	102,200	101,700	102,200	101,100	101,700
Oct	97,600	100,500	101,500	101,600	101,200	101,600	100,600	101,000
Nov	108,100	110,900	111,900	112,100	111,700	112,100	111,100	111,500
Dec	118,900	121,700	122,700	122,900	122,500	122,900	121,900	122,300
Average	124,200	127,500	128,500	128,700	128,300	128,700	127,600	128,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	1,000 (0.7)	1,200 (0.9)	800 (0.6)	1,200 (0.9)	100 (0.1)	500 (0.4)
Feb	---	---	1,200 (0.8)	1,400 (0.9)	1,000 (0.7)	1,400 (0.9)	200 (0.1)	500 (0.3)
Mar	---	---	1,100 (0.7)	1,200 (0.8)	900 (0.6)	1,200 (0.8)	100 (0.1)	500 (0.3)
Apr	---	---	1,100 (0.8)	1,100 (0.8)	600 (0.4)	1,100 (0.8)	-200 (-0.1)	500 (0.4)
May	---	---	900 (0.6)	900 (0.6)	500 (0.4)	900 (0.6)	-200 (-0.1)	400 (0.3)
Jun	---	---	1,000 (0.7)	1,100 (0.8)	600 (0.4)	1,100 (0.8)	0 (0.0)	400 (0.3)
Jul	---	---	800 (0.7)	900 (0.7)	600 (0.5)	900 (0.7)	-100 (-0.1)	700 (0.6)
Aug	---	---	900 (0.8)	1,000 (0.9)	600 (0.5)	1,000 (0.9)	0 (0.0)	600 (0.5)
Sep	---	---	900 (0.9)	1,100 (1.1)	600 (0.6)	1,100 (1.1)	0 (0.0)	600 (0.6)
Oct	---	---	1,000 (1.0)	1,100 (1.1)	700 (0.7)	1,100 (1.1)	100 (0.1)	500 (0.5)
Nov	---	---	1,000 (0.9)	1,200 (1.1)	800 (0.7)	1,200 (1.1)	200 (0.2)	600 (0.5)
Dec	---	---	1,000 (0.8)	1,200 (1.0)	800 (0.7)	1,200 (1.0)	200 (0.2)	600 (0.5)
Average	---	---	1,000 (0.8)	1,200 (0.9)	800 (0.6)	1,200 (0.9)	100 (0.1)	600 (0.5)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	3,300 (2.5)	4,300 (3.3)	4,500 (3.4)	4,100 (3.1)	4,500 (3.4)	3,400 (2.6)	3,800 (2.9)
Feb	---	3,800 (2.6)	5,000 (3.5)	5,200 (3.6)	4,800 (3.3)	5,200 (3.6)	4,000 (2.8)	4,300 (3.0)
Mar	---	5,200 (3.5)	6,300 (4.2)	6,400 (4.3)	6,100 (4.1)	6,400 (4.3)	5,300 (3.6)	5,700 (3.8)
Apr	---	3,400 (2.5)	4,500 (3.3)	4,500 (3.3)	4,000 (2.9)	4,500 (3.3)	3,200 (2.3)	3,900 (2.8)
May	---	4,600 (3.4)	5,500 (4.1)	5,500 (4.1)	5,100 (3.8)	5,500 (4.1)	4,400 (3.3)	5,000 (3.7)
Jun	---	2,500 (1.8)	3,500 (2.5)	3,600 (2.5)	3,100 (2.2)	3,600 (2.5)	2,500 (1.8)	2,900 (2.0)
Jul	---	2,700 (2.3)	3,500 (3.0)	3,600 (3.1)	3,300 (2.8)	3,600 (3.1)	2,600 (2.2)	3,400 (2.9)
Aug	---	3,200 (2.9)	4,100 (3.7)	4,200 (3.8)	3,800 (3.5)	4,200 (3.8)	3,200 (2.9)	3,800 (3.5)
Sep	---	3,100 (3.2)	4,000 (4.1)	4,200 (4.3)	3,700 (3.8)	4,200 (4.3)	3,100 (3.2)	3,700 (3.8)
Oct	---	2,900 (3.0)	3,900 (4.0)	4,000 (4.1)	3,600 (3.7)	4,000 (4.1)	3,000 (3.1)	3,400 (3.5)
Nov	---	2,800 (2.6)	3,800 (3.5)	4,000 (3.7)	3,600 (3.3)	4,000 (3.7)	3,000 (2.8)	3,400 (3.1)
Dec	---	2,800 (2.4)	3,800 (3.2)	4,000 (3.4)	3,600 (3.0)	4,000 (3.4)	3,000 (2.5)	3,400 (2.9)
Average	---	3,300 (2.7)	4,300 (3.5)	4,500 (3.6)	4,100 (3.3)	4,500 (3.6)	3,400 (2.7)	3,900 (3.1)

Table 83. Monthly Storage Contents Normal Year (2005) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	67,400	80,300	80,900	81,300	82,800	81,000	81,100	78,700
Feb	85,100	91,100	93,500	93,800	95,300	93,500	91,200	89,300
Mar	92,900	101,300	104,200	104,300	105,400	104,000	101,700	100,100
Apr	107,800	116,400	119,200	119,400	120,500	119,100	116,800	115,200
May	83,600	92,900	95,600	95,700	96,900	95,500	93,700	91,800
Jun	65,600	75,000	77,700	77,900	79,000	77,600	75,900	74,000
Jul	34,800	44,300	46,900	47,100	48,200	46,800	45,200	43,300
Aug	33,800	43,100	45,600	45,800	46,800	45,500	43,900	42,100
Sep	33,000	42,100	44,700	44,800	45,800	44,500	43,000	41,200
Oct	30,500	39,700	42,200	42,300	43,200	42,000	40,600	38,700
Nov	36,000	45,200	47,600	47,700	48,600	47,500	46,100	44,200
Dec	42,800	51,900	54,300	54,400	55,400	54,200	52,800	50,900
Average	59,400	68,600	71,000	71,200	72,300	70,900	69,300	67,500
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	600 (0.7)	1,000 (1.2)	2,500 (3.1)	700 (0.9)	800 (1.0)	-1,600 (-2.0)
Feb	---	---	2,400 (2.6)	2,700 (3.0)	4,200 (4.6)	2,400 (2.6)	100 (0.1)	-1,800 (-2.0)
Mar	---	---	2,900 (2.9)	3,000 (3.0)	4,100 (4.0)	2,700 (2.7)	400 (0.4)	-1,200 (-1.2)
Apr	---	---	2,800 (2.4)	3,000 (2.6)	4,100 (3.5)	2,700 (2.3)	400 (0.3)	-1,200 (-1.0)
May	---	---	2,700 (2.9)	2,800 (3.0)	4,000 (4.3)	2,600 (2.8)	800 (0.9)	-1,100 (-1.2)
Jun	---	---	2,700 (3.6)	2,900 (3.9)	4,000 (5.3)	2,600 (3.5)	900 (1.2)	-1,000 (-1.3)
Jul	---	---	2,600 (5.9)	2,800 (6.3)	3,900 (8.8)	2,500 (5.6)	900 (2.0)	-1,000 (-2.3)
Aug	---	---	2,500 (5.8)	2,700 (6.3)	3,700 (8.6)	2,400 (5.6)	800 (1.9)	-1,000 (-2.3)
Sep	---	---	2,600 (6.2)	2,700 (6.4)	3,700 (8.8)	2,400 (5.7)	900 (2.1)	-900 (-2.1)
Oct	---	---	2,500 (6.3)	2,600 (6.5)	3,500 (8.8)	2,300 (5.8)	900 (2.3)	-1,000 (-2.5)
Nov	---	---	2,400 (5.3)	2,500 (5.5)	3,400 (7.5)	2,300 (5.1)	900 (2.0)	-1,000 (-2.2)
Dec	---	---	2,400 (4.6)	2,500 (4.8)	3,500 (6.7)	2,300 (4.4)	900 (1.7)	-1,000 (-1.9)
Average	---	---	2,400 (3.5)	2,600 (3.8)	3,700 (5.4)	2,300 (3.4)	700 (1.0)	-1,100 (-1.6)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	12,900 (19.1)	13,500 (20.0)	13,900 (20.6)	15,400 (22.8)	13,600 (20.2)	13,700 (20.3)	11,300 (16.8)
Feb	---	6,000 (7.1)	8,400 (9.9)	8,700 (10.2)	10,200 (12.0)	8,400 (9.9)	6,100 (7.2)	4,200 (4.9)
Mar	---	8,400 (9.0)	11,300 (12.2)	11,400 (12.3)	12,500 (13.5)	11,100 (11.9)	8,800 (9.5)	7,200 (7.8)
Apr	---	8,600 (8.0)	11,400 (10.6)	11,600 (10.8)	12,700 (11.8)	11,300 (10.5)	9,000 (8.3)	7,400 (6.9)
May	---	9,300 (11.1)	12,000 (14.4)	12,100 (14.5)	13,300 (15.9)	11,900 (14.2)	10,100 (12.1)	8,200 (9.8)
Jun	---	9,400 (14.3)	12,100 (18.4)	12,300 (18.8)	13,400 (20.4)	12,000 (18.3)	10,300 (15.7)	8,400 (12.8)
Jul	---	9,500 (27.3)	12,100 (34.8)	12,300 (35.3)	13,400 (38.5)	12,000 (34.5)	10,400 (29.9)	8,500 (24.4)
Aug	---	9,300 (27.5)	11,800 (34.9)	12,000 (35.5)	13,000 (38.5)	11,700 (34.6)	10,100 (29.9)	8,300 (24.6)
Sep	---	9,100 (27.6)	11,700 (35.5)	11,800 (35.8)	12,800 (38.8)	11,500 (34.8)	10,000 (30.3)	8,200 (24.8)
Oct	---	9,200 (30.2)	11,700 (38.4)	11,800 (38.7)	12,700 (41.6)	11,500 (37.7)	10,100 (33.1)	8,200 (26.9)
Nov	---	9,200 (25.6)	11,600 (32.2)	11,700 (32.5)	12,600 (35.0)	11,500 (31.9)	10,100 (28.1)	8,200 (22.8)
Dec	---	9,100 (21.3)	11,500 (26.9)	11,600 (27.1)	12,600 (29.4)	11,400 (26.6)	10,000 (23.4)	8,100 (18.9)
Average	---	9,200 (15.5)	11,600 (19.5)	11,800 (19.9)	12,900 (21.7)	11,500 (19.4)	9,900 (16.7)	8,100 (13.6)

Table 84. Monthly Storage Contents Wet Year (1997) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	210,900	201,200	201,200	202,100	198,300	202,800	199,500	205,900
Feb	233,000	223,200	223,200	224,100	220,400	224,800	221,600	228,000
Mar	227,400	218,400	218,600	219,300	215,600	220,100	216,700	223,700
Apr	184,100	175,600	175,800	176,400	172,800	177,200	173,900	180,800
May	156,200	148,200	148,400	149,000	145,500	149,800	146,600	153,400
Jun	268,700	261,100	261,300	261,900	258,400	262,700	259,500	266,200
Jul	183,900	176,900	177,100	177,600	174,300	178,400	175,300	181,800
Aug	241,600	235,000	235,200	235,800	232,500	236,500	233,800	239,800
Sep	214,900	208,800	209,000	209,600	206,300	210,300	207,700	213,500
Oct	223,600	218,700	218,600	219,200	216,300	219,900	217,400	223,200
Nov	273,900	268,900	268,800	269,400	266,500	270,100	267,700	273,400
Dec	275,800	270,700	270,600	271,200	268,300	271,900	269,500	275,200
Average	224,500	217,200	217,300	218,000	214,600	218,700	215,800	222,100
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	0 (0.0)	900 (0.4)	-2,900 (-1.4)	1,600 (0.8)	-1,700 (-0.8)	4,700 (2.3)
Feb	---	---	0 (0.0)	900 (0.4)	-2,800 (-1.3)	1,600 (0.7)	-1,600 (-0.7)	4,800 (2.2)
Mar	---	---	200 (0.1)	900 (0.4)	-2,800 (-1.3)	1,700 (0.8)	-1,700 (-0.8)	5,300 (2.4)
Apr	---	---	200 (0.1)	800 (0.5)	-2,800 (-1.6)	1,600 (0.9)	-1,700 (-1.0)	5,200 (3.0)
May	---	---	200 (0.1)	800 (0.5)	-2,700 (-1.8)	1,600 (1.1)	-1,600 (-1.1)	5,200 (3.5)
Jun	---	---	200 (0.1)	800 (0.3)	-2,700 (-1.0)	1,600 (0.6)	-1,600 (-0.6)	5,100 (2.0)
Jul	---	---	200 (0.1)	700 (0.4)	-2,600 (-1.5)	1,500 (0.8)	-1,600 (-0.9)	4,900 (2.8)
Aug	---	---	200 (0.1)	800 (0.3)	-2,500 (-1.1)	1,500 (0.6)	-1,200 (-0.5)	4,800 (2.0)
Sep	---	---	200 (0.1)	800 (0.4)	-2,500 (-1.2)	1,500 (0.7)	-1,100 (-0.5)	4,700 (2.3)
Oct	---	---	-100 (0.0)	500 (0.2)	-2,400 (-1.1)	1,200 (0.5)	-1,300 (-0.6)	4,500 (2.1)
Nov	---	---	-100 (0.0)	500 (0.2)	-2,400 (-0.9)	1,200 (0.4)	-1,200 (-0.4)	4,500 (1.7)
Dec	---	---	-100 (0.0)	500 (0.2)	-2,400 (-0.9)	1,200 (0.4)	-1,200 (-0.4)	4,500 (1.7)
Average	---	---	100 (0.0)	800 (0.4)	-2,600 (-1.2)	1,500 (0.7)	-1,400 (-0.6)	4,900 (2.3)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	-9,700 (-4.6)	-9,700 (-4.6)	-8,800 (-4.2)	-12,600 (-6.0)	-8,100 (-3.8)	-11,400 (-5.4)	-5,000 (-2.4)
Feb	---	-9,800 (-4.2)	-9,800 (-4.2)	-8,900 (-3.8)	-12,600 (-5.4)	-8,200 (-3.5)	-11,400 (-4.9)	-5,000 (-2.1)
Mar	---	-9,000 (-4.0)	-8,800 (-3.9)	-8,100 (-3.6)	-11,800 (-5.2)	-7,300 (-3.2)	-10,700 (-4.7)	-3,700 (-1.6)
Apr	---	-8,500 (-4.6)	-8,300 (-4.5)	-7,700 (-4.2)	-11,300 (-6.1)	-6,900 (-3.7)	-10,200 (-5.5)	-3,300 (-1.8)
May	---	-8,000 (-5.1)	-7,800 (-5.0)	-7,200 (-4.6)	-10,700 (-6.9)	-6,400 (-4.1)	-9,600 (-6.1)	-2,800 (-1.8)
Jun	---	-7,600 (-2.8)	-7,400 (-2.8)	-6,800 (-2.5)	-10,300 (-3.8)	-6,000 (-2.2)	-9,200 (-3.4)	-2,500 (-0.9)
Jul	---	-7,000 (-3.8)	-6,800 (-3.7)	-6,300 (-3.4)	-9,600 (-5.2)	-5,500 (-3.0)	-8,600 (-4.7)	-2,100 (-1.1)
Aug	---	-6,600 (-2.7)	-6,400 (-2.6)	-5,800 (-2.4)	-9,100 (-3.8)	-5,100 (-2.1)	-7,800 (-3.2)	-1,800 (-0.7)
Sep	---	-6,100 (-2.8)	-5,900 (-2.7)	-5,300 (-2.5)	-8,600 (-4.0)	-4,600 (-2.1)	-7,200 (-3.4)	-1,400 (-0.7)
Oct	---	-4,900 (-2.2)	-5,000 (-2.2)	-4,400 (-2.0)	-7,300 (-3.3)	-3,700 (-1.7)	-6,200 (-2.8)	-400 (-0.2)
Nov	---	-5,000 (-1.8)	-5,100 (-1.9)	-4,500 (-1.6)	-7,400 (-2.7)	-3,800 (-1.4)	-6,200 (-2.3)	-500 (-0.2)
Dec	---	-5,100 (-1.8)	-5,200 (-1.9)	-4,600 (-1.7)	-7,500 (-2.7)	-3,900 (-1.4)	-6,300 (-2.3)	-600 (-0.2)
Average	---	-7,300 (-3.3)	-7,200 (-3.2)	-6,500 (-2.9)	-9,900 (-4.4)	-5,800 (-2.6)	-8,700 (-3.9)	-2,400 (-1.1)

Table 85. Monthly Storage Contents Dry Year (2004) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Contents (ac-ft)								
Jan	48,300	65,700	66,500	66,900	68,500	66,500	66,500	63,700
Feb	52,800	69,700	70,400	70,800	72,500	70,500	70,600	67,700
Mar	47,400	63,800	64,400	64,800	66,500	64,500	64,600	61,900
Apr	24,900	41,000	41,600	42,000	43,600	41,700	41,800	39,100
May	21,400	37,100	37,700	38,100	39,700	37,800	37,900	35,300
Jun	20,700	36,000	36,600	37,000	38,500	36,600	36,700	34,200
Jul	23,600	38,400	38,900	39,300	40,800	39,000	39,000	36,600
Aug	35,500	49,800	50,300	50,700	52,100	50,400	50,500	48,100
Sep	33,400	47,500	48,000	48,400	49,800	48,100	48,200	45,800
Oct	32,400	46,200	46,900	47,200	48,700	46,900	47,000	44,600
Nov	43,000	56,700	57,400	57,700	59,200	57,400	57,500	55,100
Dec	54,200	67,900	68,500	68,900	70,300	68,600	68,700	66,300
Average	36,500	51,700	52,300	52,700	54,200	52,300	52,400	49,900
Change in Contents Compared to No Action [ac-ft (%)]								
Jan	---	---	800 (1.2)	1,200 (1.8)	2,800 (4.3)	800 (1.2)	800 (1.2)	-2,000 (-3.0)
Feb	---	---	700 (1.0)	1,100 (1.6)	2,800 (4.0)	800 (1.1)	900 (1.3)	-2,000 (-2.9)
Mar	---	---	600 (0.9)	1,000 (1.6)	2,700 (4.2)	700 (1.1)	800 (1.3)	-1,900 (-3.0)
Apr	---	---	600 (1.5)	1,000 (2.4)	2,600 (6.3)	700 (1.7)	800 (2.0)	-1,900 (-4.6)
May	---	---	600 (1.6)	1,000 (2.7)	2,600 (7.0)	700 (1.9)	800 (2.2)	-1,800 (-4.9)
Jun	---	---	600 (1.7)	1,000 (2.8)	2,500 (6.9)	600 (1.7)	700 (1.9)	-1,800 (-5.0)
Jul	---	---	500 (1.3)	900 (2.3)	2,400 (6.3)	600 (1.6)	600 (1.6)	-1,800 (-4.7)
Aug	---	---	500 (1.0)	900 (1.8)	2,300 (4.6)	600 (1.2)	700 (1.4)	-1,700 (-3.4)
Sep	---	---	500 (1.1)	900 (1.9)	2,300 (4.8)	600 (1.3)	700 (1.5)	-1,700 (-3.6)
Oct	---	---	700 (1.5)	1,000 (2.2)	2,500 (5.4)	700 (1.5)	800 (1.7)	-1,600 (-3.5)
Nov	---	---	700 (1.2)	1,000 (1.8)	2,500 (4.4)	700 (1.2)	800 (1.4)	-1,600 (-2.8)
Dec	---	---	600 (0.9)	1,000 (1.5)	2,400 (3.5)	700 (1.0)	800 (1.2)	-1,600 (-2.4)
Average	---	---	600 (1.2)	1,000 (1.9)	2,500 (4.8)	600 (1.2)	700 (1.4)	-1,800 (-3.5)
Change in Contents Compared to Existing Conditions [ac-ft (%)]								
Jan	---	17,400 (36.0)	18,200 (37.7)	18,600 (38.5)	20,200 (41.8)	18,200 (37.7)	18,200 (37.7)	15,400 (31.9)
Feb	---	16,900 (32.0)	17,600 (33.3)	18,000 (34.1)	19,700 (37.3)	17,700 (33.5)	17,800 (33.7)	14,900 (28.2)
Mar	---	16,400 (34.6)	17,000 (35.9)	17,400 (36.7)	19,100 (40.3)	17,100 (36.1)	17,200 (36.3)	14,500 (30.6)
Apr	---	16,100 (64.7)	16,700 (67.1)	17,100 (68.7)	18,700 (75.1)	16,800 (67.5)	16,900 (67.9)	14,200 (57.0)
May	---	15,700 (73.4)	16,300 (76.2)	16,700 (78.0)	18,300 (85.5)	16,400 (76.6)	16,500 (77.1)	13,900 (65.0)
Jun	---	15,300 (73.9)	15,900 (76.8)	16,300 (78.7)	17,800 (86.0)	15,900 (76.8)	16,000 (77.3)	13,500 (65.2)
Jul	---	14,800 (62.7)	15,300 (64.8)	15,700 (66.5)	17,200 (72.9)	15,400 (65.3)	15,400 (65.3)	13,000 (55.1)
Aug	---	14,300 (40.3)	14,800 (41.7)	15,200 (42.8)	16,600 (46.8)	14,900 (42.0)	15,000 (42.3)	12,600 (35.5)
Sep	---	14,100 (42.2)	14,600 (43.7)	15,000 (44.9)	16,400 (49.1)	14,700 (44.0)	14,800 (44.3)	12,400 (37.1)
Oct	---	13,800 (42.6)	14,500 (44.8)	14,800 (45.7)	16,300 (50.3)	14,500 (44.8)	14,600 (45.1)	12,200 (37.7)
Nov	---	13,700 (31.9)	14,400 (33.5)	14,700 (34.2)	16,200 (37.7)	14,400 (33.5)	14,500 (33.7)	12,100 (28.1)
Dec	---	13,700 (25.3)	14,300 (26.4)	14,700 (27.1)	16,100 (29.7)	14,400 (26.6)	14,500 (26.8)	12,100 (22.3)
Average	---	15,200 (41.6)	15,800 (43.3)	16,200 (44.4)	17,700 (48.5)	15,800 (43.3)	15,900 (43.6)	13,400 (36.7)

Table 86. Monthly Depth Overall Average – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	44.1	45.3	45.5	45.6	45.5	45.6	45.4	45.4
Feb	46.4	47.6	47.8	47.9	47.8	47.9	47.6	47.6
Mar	47.4	48.7	48.9	49.0	48.9	49.0	48.8	48.8
Apr	45.3	46.6	46.8	46.9	46.8	46.8	46.6	46.6
May	44.4	45.9	46.0	46.1	46.0	46.1	45.8	45.9
Jun	44.9	46.3	46.5	46.5	46.4	46.5	46.3	46.3
Jul	40.2	41.9	42.1	42.1	42.1	42.1	41.9	41.9
Aug	38.9	40.8	41.0	41.0	40.9	41.0	40.8	40.8
Sep	37.1	38.9	39.1	39.2	39.1	39.1	38.9	38.9
Oct	36.9	38.6	38.8	38.9	38.8	38.9	38.6	38.6
Nov	39.2	40.8	41.0	41.1	41.0	41.1	40.8	40.8
Dec	41.6	43.0	43.2	43.2	43.2	43.2	43.0	43.0
Average	42.2	43.7	43.9	43.9	43.9	43.9	43.7	43.7
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.2 (0.4)	0.2 (0.5)	0.2 (0.4)	0.2 (0.5)	0.0 (0.1)	0.0 (0.0)
Feb	---	---	0.2 (0.4)	0.2 (0.5)	0.2 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.0)
Mar	---	---	0.2 (0.4)	0.2 (0.5)	0.2 (0.4)	0.2 (0.4)	0.0 (0.0)	0.0 (0.0)
Apr	---	---	0.2 (0.5)	0.2 (0.5)	0.2 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.1)
May	---	---	0.2 (0.4)	0.2 (0.5)	0.1 (0.3)	0.2 (0.4)	0.0 (-0.1)	0.0 (0.1)
Jun	---	---	0.2 (0.4)	0.2 (0.5)	0.2 (0.3)	0.2 (0.5)	0.0 (0.0)	0.0 (0.0)
Jul	---	---	0.2 (0.5)	0.2 (0.6)	0.2 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.1)
Aug	---	---	0.2 (0.5)	0.2 (0.6)	0.1 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.1)
Sep	---	---	0.2 (0.6)	0.3 (0.7)	0.2 (0.4)	0.2 (0.6)	0.0 (0.0)	0.0 (0.1)
Oct	---	---	0.3 (0.7)	0.3 (0.8)	0.2 (0.5)	0.3 (0.7)	0.0 (0.1)	0.0 (0.1)
Nov	---	---	0.2 (0.5)	0.3 (0.6)	0.2 (0.5)	0.2 (0.6)	0.0 (0.1)	0.0 (0.1)
Dec	---	---	0.2 (0.5)	0.2 (0.5)	0.2 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.1)
Average	---	---	0.2 (0.5)	0.2 (0.6)	0.2 (0.4)	0.2 (0.5)	0.0 (0.0)	0.0 (0.0)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	1.2 (2.8)	1.4 (3.3)	1.5 (3.3)	1.4 (3.3)	1.5 (3.3)	1.3 (2.9)	1.3 (2.9)
Feb	---	1.2 (2.6)	1.4 (3.1)	1.5 (3.1)	1.4 (3.1)	1.4 (3.1)	1.2 (2.7)	1.2 (2.6)
Mar	---	1.3 (2.8)	1.5 (3.2)	1.6 (3.3)	1.5 (3.2)	1.5 (3.2)	1.3 (2.8)	1.4 (2.8)
Apr	---	1.3 (2.8)	1.5 (3.3)	1.5 (3.3)	1.4 (3.2)	1.5 (3.3)	1.3 (2.8)	1.3 (2.9)
May	---	1.5 (3.3)	1.7 (3.7)	1.7 (3.8)	1.6 (3.6)	1.7 (3.7)	1.4 (3.2)	1.5 (3.4)
Jun	---	1.4 (3.0)	1.6 (3.5)	1.6 (3.5)	1.5 (3.3)	1.6 (3.5)	1.3 (3.0)	1.4 (3.0)
Jul	---	1.7 (4.2)	1.9 (4.7)	1.9 (4.8)	1.8 (4.6)	1.9 (4.7)	1.7 (4.2)	1.7 (4.2)
Aug	---	1.9 (4.8)	2.1 (5.4)	2.1 (5.4)	2.0 (5.2)	2.1 (5.4)	1.9 (4.8)	1.9 (4.9)
Sep	---	1.8 (4.8)	2.0 (5.4)	2.0 (5.5)	2.0 (5.3)	2.0 (5.5)	1.8 (4.8)	1.8 (4.9)
Oct	---	1.7 (4.6)	2.0 (5.3)	2.0 (5.4)	1.9 (5.2)	2.0 (5.3)	1.7 (4.7)	1.7 (4.7)
Nov	---	1.6 (4.1)	1.8 (4.7)	1.9 (4.8)	1.8 (4.7)	1.9 (4.7)	1.7 (4.2)	1.7 (4.2)
Dec	---	1.4 (3.3)	1.6 (3.8)	1.6 (3.8)	1.5 (3.7)	1.6 (3.8)	1.4 (3.3)	1.4 (3.3)
Average	---	1.5 (3.5)	1.7 (4.0)	1.7 (4.1)	1.7 (4.0)	1.7 (4.1)	1.5 (3.6)	1.5 (3.6)

Table 87. Monthly Depth Average Year (2005) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	35.3	38.5	38.6	38.7	39.1	38.7	38.7	38.1
Feb	39.7	40.8	41.2	41.3	41.5	41.2	40.8	40.5
Mar	41.1	42.6	43.1	43.1	43.3	43.1	42.7	42.4
Apr	43.7	45.2	45.7	45.7	45.9	45.7	45.3	45.0
May	39.3	41.1	41.6	41.6	41.8	41.6	41.3	40.9
Jun	34.8	37.2	37.8	37.9	38.2	37.8	37.4	36.9
Jul	26.1	29.4	30.2	30.2	30.5	30.1	29.7	29.1
Aug	25.8	29.0	29.8	29.9	30.2	29.8	29.3	28.6
Sep	25.5	28.7	29.5	29.6	29.9	29.5	28.9	28.3
Oct	24.6	27.8	28.7	28.7	29.0	28.6	28.1	27.5
Nov	26.5	29.7	30.3	30.4	30.6	30.3	30.0	29.3
Dec	28.9	31.4	32.0	32.1	32.3	32.0	31.6	31.2
Average	32.6	35.1	35.7	35.8	36.0	35.7	35.3	34.8
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.1 (0.4)	0.2 (0.6)	0.6 (1.6)	0.2 (0.4)	0.2 (0.5)	-0.4 (-1.0)
Feb	---	---	0.4 (1.0)	0.5 (1.1)	0.7 (1.8)	0.4 (1.0)	0.0 (0.0)	-0.3 (-0.8)
Mar	---	---	0.5 (1.2)	0.5 (1.2)	0.7 (1.7)	0.5 (1.1)	0.1 (0.2)	-0.2 (-0.5)
Apr	---	---	0.5 (1.1)	0.5 (1.2)	0.7 (1.6)	0.5 (1.0)	0.1 (0.2)	-0.2 (-0.4)
May	---	---	0.5 (1.1)	0.5 (1.2)	0.7 (1.7)	0.4 (1.1)	0.2 (0.4)	-0.2 (-0.5)
Jun	---	---	0.7 (1.8)	0.7 (1.9)	1.0 (2.6)	0.6 (1.7)	0.2 (0.6)	-0.3 (-0.7)
Jul	---	---	0.8 (2.6)	0.8 (2.7)	1.1 (3.7)	0.7 (2.5)	0.3 (1.0)	-0.4 (-1.2)
Aug	---	---	0.9 (3.0)	0.9 (3.1)	1.2 (4.0)	0.8 (2.8)	0.3 (1.0)	-0.3 (-1.2)
Sep	---	---	0.9 (3.0)	0.9 (3.2)	1.2 (4.3)	0.8 (2.9)	0.3 (1.0)	-0.3 (-1.2)
Oct	---	---	0.8 (3.0)	0.9 (3.1)	1.2 (4.3)	0.8 (2.8)	0.3 (1.1)	-0.4 (-1.3)
Nov	---	---	0.6 (2.2)	0.7 (2.3)	0.9 (3.0)	0.6 (2.0)	0.3 (0.9)	-0.4 (-1.2)
Dec	---	---	0.6 (1.9)	0.6 (2.0)	0.9 (2.8)	0.6 (1.8)	0.2 (0.7)	-0.3 (-0.8)
Average	---	---	0.6 (1.7)	0.6 (1.8)	0.9 (2.6)	0.6 (1.7)	0.2 (0.6)	-0.3 (-0.9)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	3.2 (9.2)	3.4 (9.6)	3.5 (9.8)	3.8 (10.9)	3.4 (9.6)	3.4 (9.7)	2.8 (8.0)
Feb	---	1.1 (2.9)	1.6 (3.9)	1.6 (4.1)	1.9 (4.7)	1.6 (4.0)	1.2 (2.9)	0.8 (2.1)
Mar	---	1.5 (3.5)	2.0 (4.8)	2.0 (4.8)	2.2 (5.3)	1.9 (4.7)	1.5 (3.7)	1.3 (3.0)
Apr	---	1.5 (3.4)	2.0 (4.5)	2.0 (4.6)	2.2 (5.0)	2.0 (4.5)	1.6 (3.6)	1.3 (2.9)
May	---	1.8 (4.6)	2.3 (5.8)	2.3 (5.9)	2.5 (6.4)	2.3 (5.8)	2.0 (5.0)	1.6 (4.1)
Jun	---	2.3 (6.7)	3.0 (8.7)	3.0 (8.7)	3.3 (9.5)	3.0 (8.5)	2.6 (7.4)	2.1 (6.0)
Jul	---	3.3 (12.6)	4.1 (15.6)	4.1 (15.7)	4.4 (16.7)	4.0 (15.4)	3.6 (13.7)	2.9 (11.2)
Aug	---	3.2 (12.5)	4.1 (15.8)	4.1 (15.9)	4.4 (17.0)	4.0 (15.7)	3.5 (13.6)	2.9 (11.1)
Sep	---	3.2 (12.4)	4.0 (15.8)	4.1 (15.9)	4.4 (17.2)	4.0 (15.6)	3.4 (13.5)	2.8 (11.0)
Oct	---	3.2 (12.9)	4.0 (16.3)	4.1 (16.5)	4.4 (17.7)	4.0 (16.1)	3.5 (14.2)	2.8 (11.5)
Nov	---	3.2 (12.0)	3.8 (14.4)	3.8 (14.5)	4.1 (15.4)	3.8 (14.2)	3.4 (13.0)	2.8 (10.6)
Dec	---	2.5 (8.8)	3.1 (10.9)	3.2 (11.0)	3.4 (11.8)	3.1 (10.8)	2.8 (9.6)	2.3 (7.9)
Average	---	2.5 (7.7)	3.1 (9.5)	3.1 (9.7)	3.4 (10.5)	3.1 (9.4)	2.7 (8.3)	2.2 (6.8)

Table 88. Monthly Depth Dry Year (2004) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	30.5	34.8	35.0	35.1	35.5	35.1	35.1	34.4
Feb	31.6	35.8	36.0	36.1	36.5	36.0	36.1	35.4
Mar	30.3	34.4	34.5	34.6	35.0	34.6	34.6	33.9
Apr	22.7	28.3	28.5	28.6	29.2	28.5	28.5	27.6
May	21.5	26.9	27.1	27.3	27.8	27.2	27.2	26.3
Jun	21.2	26.5	26.7	26.9	27.4	26.8	26.8	25.9
Jul	22.2	27.3	27.5	27.7	28.2	27.6	27.6	26.7
Aug	26.3	30.9	31.0	31.1	31.5	31.0	31.1	30.5
Sep	25.6	30.3	30.5	30.5	30.9	30.5	30.5	29.9
Oct	25.3	30.0	30.2	30.3	30.6	30.2	30.2	29.5
Nov	29.0	32.6	32.8	32.9	33.2	32.8	32.8	32.2
Dec	32.0	35.4	35.6	35.6	36.0	35.6	35.6	35.0
Average	26.5	31.1	31.3	31.4	31.8	31.3	31.3	30.6
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.2 (0.6)	0.3 (0.9)	0.7 (2.0)	0.2 (0.6)	0.2 (0.6)	-0.5 (-1.4)
Feb	---	---	0.2 (0.5)	0.3 (0.8)	0.7 (1.9)	0.2 (0.5)	0.2 (0.6)	-0.5 (-1.3)
Mar	---	---	0.2 (0.5)	0.3 (0.8)	0.7 (2.0)	0.2 (0.5)	0.2 (0.6)	-0.5 (-1.4)
Apr	---	---	0.2 (0.8)	0.4 (1.3)	0.9 (3.2)	0.2 (0.9)	0.3 (1.0)	-0.6 (-2.3)
May	---	---	0.2 (0.8)	0.3 (1.3)	0.9 (3.3)	0.2 (0.9)	0.3 (1.0)	-0.6 (-2.4)
Jun	---	---	0.2 (0.8)	0.3 (1.3)	0.9 (3.3)	0.2 (0.9)	0.3 (1.0)	-0.6 (-2.3)
Jul	---	---	0.2 (0.7)	0.3 (1.2)	0.8 (3.1)	0.2 (0.8)	0.2 (0.9)	-0.6 (-2.2)
Aug	---	---	0.1 (0.4)	0.2 (0.7)	0.6 (1.9)	0.1 (0.5)	0.2 (0.6)	-0.4 (-1.3)
Sep	---	---	0.1 (0.5)	0.2 (0.7)	0.6 (1.9)	0.1 (0.5)	0.2 (0.6)	-0.4 (-1.4)
Oct	---	---	0.2 (0.5)	0.2 (0.8)	0.6 (2.1)	0.2 (0.6)	0.2 (0.7)	-0.5 (-1.7)
Nov	---	---	0.2 (0.5)	0.2 (0.8)	0.6 (1.9)	0.2 (0.5)	0.2 (0.6)	-0.4 (-1.2)
Dec	---	---	0.2 (0.5)	0.2 (0.7)	0.6 (1.7)	0.2 (0.5)	0.2 (0.6)	-0.4 (-1.1)
Average	---	---	0.2 (0.6)	0.3 (0.9)	0.7 (2.3)	0.2 (0.6)	0.2 (0.7)	-0.5 (-1.6)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	4.3 (14.1)	4.5 (14.8)	4.6 (15.1)	5.0 (16.4)	4.5 (14.8)	4.5 (14.8)	3.8 (12.6)
Feb	---	4.2 (13.3)	4.4 (13.8)	4.5 (14.2)	4.9 (15.5)	4.4 (13.9)	4.4 (14.0)	3.7 (11.8)
Mar	---	4.1 (13.4)	4.2 (14.0)	4.3 (14.3)	4.7 (15.7)	4.3 (14.0)	4.3 (14.1)	3.6 (11.9)
Apr	---	5.6 (24.5)	5.8 (25.4)	5.9 (26.0)	6.5 (28.5)	5.8 (25.5)	5.8 (25.7)	4.9 (21.6)
May	---	5.4 (25.2)	5.6 (26.2)	5.8 (26.8)	6.3 (29.4)	5.7 (26.3)	5.7 (26.5)	4.8 (22.3)
Jun	---	5.3 (24.9)	5.5 (25.8)	5.6 (26.5)	6.2 (29.0)	5.5 (25.9)	5.5 (26.1)	4.7 (22.0)
Jul	---	5.1 (23.0)	5.3 (23.9)	5.4 (24.4)	5.9 (26.8)	5.3 (23.9)	5.4 (24.1)	4.5 (20.3)
Aug	---	4.5 (17.2)	4.7 (17.8)	4.8 (18.1)	5.1 (19.5)	4.7 (17.8)	4.7 (17.9)	4.1 (15.7)
Sep	---	4.7 (18.2)	4.8 (18.8)	4.9 (19.1)	5.2 (20.5)	4.8 (18.8)	4.8 (18.9)	4.3 (16.6)
Oct	---	4.7 (18.6)	4.9 (19.3)	5.0 (19.6)	5.3 (21.1)	4.9 (19.3)	4.9 (19.4)	4.2 (16.6)
Nov	---	3.7 (12.6)	3.8 (13.2)	3.9 (13.5)	4.3 (14.8)	3.8 (13.3)	3.9 (13.3)	3.3 (11.3)
Dec	---	3.4 (10.7)	3.6 (11.2)	3.7 (11.4)	4.0 (12.6)	3.6 (11.2)	3.6 (11.3)	3.0 (9.4)
Average	---	4.6 (17.3)	4.8 (17.9)	4.9 (18.3)	5.3 (20.0)	4.8 (18.0)	4.8 (18.1)	4.1 (15.4)

Table 89. Monthly Depth Wet Year (1997) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Depth (ft)								
Jan	58.5	57.3	57.3	57.4	56.9	57.5	57.1	57.9
Feb	61.1	60.1	60.1	60.2	59.7	60.2	59.9	60.6
Mar	60.5	59.5	59.5	59.6	59.1	59.7	59.3	60.1
Apr	55.1	54.0	54.1	54.1	53.7	54.2	53.8	54.7
May	51.6	50.5	50.6	50.6	50.2	50.7	50.3	51.2
Jun	64.6	63.9	63.9	63.9	63.6	64.0	63.7	64.4
Jul	55.1	54.2	54.2	54.3	53.9	54.4	54.0	54.8
Aug	61.9	61.3	61.3	61.3	61.0	61.4	61.1	61.7
Sep	59.0	58.3	58.3	58.4	58.0	58.5	58.1	58.9
Oct	60.1	59.5	59.5	59.6	59.2	59.7	59.4	60.1
Nov	65.1	64.6	64.6	64.7	64.4	64.7	64.5	65.1
Dec	65.3	64.8	64.8	64.9	64.6	64.9	64.7	65.2
Average	59.8	59.0	59.0	59.1	58.7	59.2	58.8	59.6
Change in Depth Compared to No Action [ft (%)]								
Jan	---	---	0.0 (0.0)	0.1 (0.2)	-0.4 (-0.6)	0.2 (0.4)	-0.2 (-0.4)	0.6 (1.1)
Feb	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.6)	0.2 (0.3)	-0.2 (-0.3)	0.5 (0.8)
Mar	---	---	0.0 (0.1)	0.1 (0.2)	-0.4 (-0.6)	0.2 (0.4)	-0.2 (-0.4)	0.6 (1.1)
Apr	---	---	0.0 (0.1)	0.1 (0.2)	-0.4 (-0.7)	0.2 (0.4)	-0.2 (-0.4)	0.7 (1.2)
May	---	---	0.0 (0.1)	0.1 (0.2)	-0.4 (-0.7)	0.2 (0.4)	-0.2 (-0.4)	0.7 (1.3)
Jun	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.4)	0.2 (0.2)	-0.2 (-0.2)	0.5 (0.8)
Jul	---	---	0.0 (0.0)	0.1 (0.2)	-0.3 (-0.6)	0.2 (0.3)	-0.2 (-0.4)	0.6 (1.2)
Aug	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.4)	0.1 (0.2)	-0.1 (-0.2)	0.5 (0.8)
Sep	---	---	0.0 (0.0)	0.1 (0.2)	-0.3 (-0.5)	0.2 (0.3)	-0.1 (-0.2)	0.6 (1.0)
Oct	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.5)	0.1 (0.2)	-0.2 (-0.3)	0.5 (0.9)
Nov	---	---	0.0 (0.0)	0.1 (0.1)	-0.2 (-0.4)	0.1 (0.2)	-0.1 (-0.2)	0.4 (0.7)
Dec	---	---	0.0 (0.0)	0.1 (0.1)	-0.2 (-0.4)	0.1 (0.2)	-0.1 (-0.2)	0.4 (0.7)
Average	---	---	0.0 (0.0)	0.1 (0.1)	-0.3 (-0.5)	0.2 (0.3)	-0.2 (-0.3)	0.6 (0.9)
Change in Depth Compared to Existing Conditions [ft (%)]								
Jan	---	-1.2 (-2.1)	-1.2 (-2.1)	-1.1 (-1.9)	-1.6 (-2.7)	-1.0 (-1.8)	-1.4 (-2.5)	-0.6 (-1.1)
Feb	---	-1.0 (-1.6)	-1.0 (-1.6)	-0.9 (-1.4)	-1.3 (-2.1)	-0.8 (-1.3)	-1.2 (-1.9)	-0.5 (-0.8)
Mar	---	-1.0 (-1.7)	-1.0 (-1.6)	-0.9 (-1.5)	-1.4 (-2.3)	-0.8 (-1.3)	-1.2 (-2.0)	-0.4 (-0.6)
Apr	---	-1.1 (-2.0)	-1.1 (-1.9)	-1.0 (-1.8)	-1.4 (-2.6)	-0.9 (-1.6)	-1.3 (-2.4)	-0.4 (-0.8)
May	---	-1.0 (-2.0)	-1.0 (-1.9)	-0.9 (-1.8)	-1.4 (-2.7)	-0.8 (-1.6)	-1.2 (-2.4)	-0.4 (-0.7)
Jun	---	-0.8 (-1.2)	-0.7 (-1.1)	-0.7 (-1.0)	-1.0 (-1.6)	-0.6 (-0.9)	-0.9 (-1.4)	-0.2 (-0.4)
Jul	---	-0.9 (-1.6)	-0.9 (-1.6)	-0.8 (-1.5)	-1.2 (-2.2)	-0.7 (-1.3)	-1.1 (-2.0)	-0.3 (-0.5)
Aug	---	-0.7 (-1.1)	-0.6 (-1.0)	-0.6 (-0.9)	-0.9 (-1.5)	-0.5 (-0.8)	-0.8 (-1.3)	-0.2 (-0.3)
Sep	---	-0.8 (-1.3)	-0.7 (-1.3)	-0.7 (-1.1)	-1.1 (-1.8)	-0.6 (-1.0)	-0.9 (-1.6)	-0.2 (-0.3)
Oct	---	-0.6 (-1.0)	-0.6 (-1.0)	-0.5 (-0.9)	-0.9 (-1.5)	-0.4 (-0.7)	-0.8 (-1.3)	0.0 (-0.1)
Nov	---	-0.5 (-0.8)	-0.5 (-0.8)	-0.4 (-0.7)	-0.7 (-1.1)	-0.4 (-0.6)	-0.6 (-0.9)	-0.1 (-0.1)
Dec	---	-0.5 (-0.8)	-0.5 (-0.8)	-0.5 (-0.7)	-0.7 (-1.1)	-0.4 (-0.6)	-0.6 (-1.0)	-0.1 (-0.1)
Average	---	-0.8 (-1.4)	-0.8 (-1.4)	-0.7 (-1.2)	-1.1 (-1.9)	-0.7 (-1.1)	-1.0 (-1.7)	-0.3 (-0.5)

Table 90. Monthly Surface Area Overall Average – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	5,976.6	6,080.3	6,113.9	6,118.8	6,111.7	6,118.1	6,089.1	6,091.5
Feb	6,318.0	6,464.1	6,499.3	6,503.5	6,496.6	6,502.7	6,465.7	6,475.0
Mar	6,454.8	6,654.0	6,688.8	6,692.7	6,685.9	6,690.5	6,658.3	6,660.3
Apr	6,162.3	6,315.6	6,355.2	6,359.2	6,347.5	6,356.7	6,316.0	6,323.3
May	6,045.1	6,201.8	6,233.2	6,237.2	6,225.4	6,233.5	6,196.2	6,208.4
Jun	6,234.0	6,325.0	6,354.6	6,359.2	6,344.5	6,356.3	6,325.0	6,335.8
Jul	5,460.5	5,624.7	5,653.1	5,659.7	5,642.8	5,658.1	5,624.4	5,639.6
Aug	5,189.9	5,413.6	5,440.7	5,445.1	5,423.2	5,443.8	5,405.0	5,431.6
Sep	4,907.5	5,076.5	5,113.9	5,122.0	5,098.0	5,118.8	5,074.1	5,092.9
Oct	4,873.8	5,033.8	5,083.5	5,089.1	5,072.6	5,086.2	5,043.8	5,048.7
Nov	5,208.7	5,400.5	5,427.3	5,431.0	5,417.4	5,430.6	5,400.9	5,420.4
Dec	5,594.2	5,701.6	5,723.1	5,727.8	5,716.6	5,726.5	5,697.0	5,714.8
Average	5,702.1	5,857.6	5,890.6	5,895.5	5,881.8	5,893.5	5,858.0	5,870.2
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	33.6 (0.6)	38.5 (0.6)	31.4 (0.5)	37.8 (0.6)	8.8 (0.1)	11.2 (0.2)
Feb	---	---	35.1 (0.5)	39.4 (0.6)	32.5 (0.5)	38.6 (0.6)	1.6 (0.0)	10.9 (0.2)
Mar	---	---	34.8 (0.5)	38.7 (0.6)	31.9 (0.5)	36.6 (0.5)	4.3 (0.1)	6.3 (0.1)
Apr	---	---	39.7 (0.6)	43.7 (0.7)	32.0 (0.5)	41.1 (0.7)	0.4 (0.0)	7.8 (0.1)
May	---	---	31.4 (0.5)	35.4 (0.6)	23.6 (0.4)	31.7 (0.5)	-5.6 (-0.1)	6.6 (0.1)
Jun	---	---	29.5 (0.5)	34.2 (0.5)	19.5 (0.3)	31.3 (0.5)	0.0 (0.0)	10.8 (0.2)
Jul	---	---	28.4 (0.5)	35.0 (0.6)	18.0 (0.3)	33.3 (0.6)	-0.4 (0.0)	14.8 (0.3)
Aug	---	---	27.1 (0.5)	31.5 (0.6)	9.6 (0.2)	30.2 (0.6)	-8.5 (-0.2)	18.0 (0.3)
Sep	---	---	37.4 (0.7)	45.6 (0.9)	21.5 (0.4)	42.3 (0.8)	-2.4 (0.0)	16.5 (0.3)
Oct	---	---	49.7 (1.0)	55.3 (1.1)	38.8 (0.8)	52.5 (1.0)	10.0 (0.2)	15.0 (0.3)
Nov	---	---	26.7 (0.5)	30.5 (0.6)	16.9 (0.3)	30.1 (0.6)	0.4 (0.0)	19.9 (0.4)
Dec	---	---	21.5 (0.4)	26.2 (0.5)	15.0 (0.3)	24.9 (0.4)	-4.6 (-0.1)	13.2 (0.2)
Average	---	---	32.9 (0.6)	37.8 (0.6)	24.2 (0.4)	35.9 (0.6)	0.3 (0.0)	12.6 (0.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	103.7 (1.7)	137.3 (2.3)	142.2 (2.4)	135.1 (2.3)	141.5 (2.4)	112.5 (1.9)	114.9 (1.9)
Feb	---	146.1 (2.3)	181.3 (2.9)	185.6 (2.9)	178.6 (2.8)	184.7 (2.9)	147.7 (2.3)	157.0 (2.5)
Mar	---	199.1 (3.1)	234.0 (3.6)	237.8 (3.7)	231.0 (3.6)	235.7 (3.7)	203.4 (3.2)	205.5 (3.2)
Apr	---	153.2 (2.5)	192.9 (3.1)	196.9 (3.2)	185.2 (3.0)	194.3 (3.2)	153.7 (2.5)	161.0 (2.6)
May	---	156.7 (2.6)	188.1 (3.1)	192.1 (3.2)	180.3 (3.0)	188.4 (3.1)	151.1 (2.5)	163.3 (2.7)
Jun	---	91.0 (1.5)	120.6 (1.9)	125.2 (2.0)	110.6 (1.8)	122.3 (2.0)	91.0 (1.5)	101.8 (1.6)
Jul	---	164.2 (3.0)	192.6 (3.5)	199.2 (3.6)	182.2 (3.3)	197.6 (3.6)	163.8 (3.0)	179.1 (3.3)
Aug	---	223.6 (4.3)	250.7 (4.8)	255.2 (4.9)	233.2 (4.5)	253.9 (4.9)	215.1 (4.1)	241.6 (4.7)
Sep	---	169.0 (3.4)	206.4 (4.2)	214.5 (4.4)	190.5 (3.9)	211.3 (4.3)	166.6 (3.4)	185.5 (3.8)
Oct	---	159.9 (3.3)	209.7 (4.3)	215.3 (4.4)	198.8 (4.1)	212.4 (4.4)	169.9 (3.5)	174.9 (3.6)
Nov	---	191.8 (3.7)	218.6 (4.2)	222.3 (4.3)	208.7 (4.0)	221.9 (4.3)	192.2 (3.7)	211.7 (4.1)
Dec	---	107.4 (1.9)	128.9 (2.3)	133.6 (2.4)	122.4 (2.2)	132.3 (2.4)	102.7 (1.8)	120.6 (2.2)
Average	---	155.5 (2.7)	188.4 (3.3)	193.3 (3.4)	179.7 (3.2)	191.4 (3.4)	155.8 (2.7)	168.1 (2.9)

Table 91. Monthly Surface Area Normal Year (2005) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	4,003.6	4,444.7	4,458.6	4,466.3	4,514.7	4,459.6	4,462.3	4,407.3
Feb	4,654.7	4,877.9	4,954.5	4,964.6	5,016.3	4,956.0	4,881.1	4,824.0
Mar	4,934.9	5,246.4	5,370.5	5,376.6	5,425.9	5,363.7	5,265.8	5,196.6
Apr	5,528.8	5,837.7	5,943.1	5,948.6	5,989.2	5,937.9	5,854.5	5,795.0
May	4,567.8	4,934.4	5,025.9	5,030.8	5,070.1	5,021.3	4,963.5	4,898.7
Jun	3,934.7	4,286.5	4,377.9	4,382.3	4,413.3	4,372.7	4,316.1	4,251.1
Jul	2,853.1	3,482.5	3,535.3	3,538.1	3,561.8	3,532.1	3,500.5	3,460.5
Aug	2,803.0	3,453.1	3,509.5	3,511.6	3,532.6	3,507.0	3,473.4	3,382.4
Sep	2,777.3	3,386.8	3,489.4	3,492.0	3,512.4	3,486.3	3,443.6	3,317.4
Oct	2,712.6	3,218.4	3,387.1	3,395.6	3,457.9	3,377.1	3,280.2	3,146.8
Nov	2,947.3	3,500.8	3,549.7	3,552.4	3,572.5	3,546.7	3,517.3	3,478.6
Dec	3,430.5	3,646.6	3,702.9	3,704.7	3,716.7	3,700.9	3,668.6	3,622.0
Average	3,762.3	4,193.0	4,275.4	4,280.3	4,315.3	4,271.8	4,218.9	4,148.4
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	13.9 (0.3)	21.6 (0.5)	70.0 (1.6)	14.9 (0.3)	17.6 (0.4)	-37.4 (-0.8)
Feb	---	---	76.6 (1.6)	86.7 (1.8)	138.4 (2.8)	78.1 (1.6)	3.2 (0.1)	-53.9 (-1.1)
Mar	---	---	124.1 (2.4)	130.3 (2.5)	179.5 (3.4)	117.4 (2.2)	19.5 (0.4)	-49.7 (-0.9)
Apr	---	---	105.4 (1.8)	110.9 (1.9)	151.5 (2.6)	100.2 (1.7)	16.8 (0.3)	-42.8 (-0.7)
May	---	---	91.5 (1.9)	96.4 (2.0)	135.7 (2.7)	86.9 (1.8)	29.1 (0.6)	-35.7 (-0.7)
Jun	---	---	91.4 (2.1)	95.8 (2.2)	126.8 (3.0)	86.2 (2.0)	29.6 (0.7)	-35.4 (-0.8)
Jul	---	---	52.9 (1.5)	55.6 (1.6)	79.3 (2.3)	49.6 (1.4)	18.0 (0.5)	-22.0 (-0.6)
Aug	---	---	56.3 (1.6)	58.5 (1.7)	79.5 (2.3)	53.9 (1.6)	20.3 (0.6)	-70.7 (-2.0)
Sep	---	---	102.6 (3.0)	105.2 (3.1)	125.6 (3.7)	99.5 (2.9)	56.8 (1.7)	-69.4 (-2.1)
Oct	---	---	168.7 (5.2)	177.2 (5.5)	239.5 (7.4)	158.7 (4.9)	61.8 (1.9)	-71.6 (-2.2)
Nov	---	---	48.9 (1.4)	51.5 (1.5)	71.7 (2.0)	45.8 (1.3)	16.4 (0.5)	-22.2 (-0.6)
Dec	---	---	56.4 (1.5)	58.1 (1.6)	70.1 (1.9)	54.3 (1.5)	22.1 (0.6)	-24.5 (-0.7)
Average	---	---	82.4 (2.0)	87.3 (2.1)	122.3 (2.9)	78.8 (1.9)	25.9 (0.6)	-44.6 (-1.1)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	441.1 (11.0)	455.0 (11.4)	462.7 (11.6)	511.1 (12.8)	456.0 (11.4)	458.8 (11.5)	403.7 (10.1)
Feb	---	223.2 (4.8)	299.8 (6.4)	309.9 (6.7)	361.6 (7.8)	301.3 (6.5)	226.4 (4.9)	169.3 (3.6)
Mar	---	311.5 (6.3)	435.6 (8.8)	441.8 (9.0)	491.0 (9.9)	428.9 (8.7)	331.0 (6.7)	261.8 (5.3)
Apr	---	308.9 (5.6)	414.2 (7.5)	419.7 (7.6)	460.4 (8.3)	409.1 (7.4)	325.6 (5.9)	266.1 (4.8)
May	---	366.6 (8.0)	458.1 (10.0)	463.0 (10.1)	502.3 (11.0)	453.5 (9.9)	395.7 (8.7)	330.9 (7.2)
Jun	---	351.8 (8.9)	443.2 (11.3)	447.6 (11.4)	478.6 (12.2)	438.0 (11.1)	381.4 (9.7)	316.4 (8.0)
Jul	---	629.4 (22.1)	682.3 (23.9)	685.1 (24.0)	708.7 (24.8)	679.0 (23.8)	647.4 (22.7)	607.4 (21.3)
Aug	---	650.1 (23.2)	706.5 (25.2)	708.6 (25.3)	729.6 (26.0)	704.0 (25.1)	670.4 (23.9)	579.4 (20.7)
Sep	---	609.5 (21.9)	712.1 (25.6)	714.7 (25.7)	735.1 (26.5)	709.0 (25.5)	666.2 (24.0)	540.0 (19.4)
Oct	---	505.8 (18.6)	674.5 (24.9)	683.0 (25.2)	745.3 (27.5)	664.5 (24.5)	567.6 (20.9)	434.2 (16.0)
Nov	---	553.6 (18.8)	602.5 (20.4)	605.1 (20.5)	625.2 (21.2)	599.4 (20.3)	570.0 (19.3)	531.3 (18.0)
Dec	---	216.1 (6.3)	272.5 (7.9)	274.2 (8.0)	286.2 (8.3)	270.4 (7.9)	238.2 (6.9)	191.6 (5.6)
Average	---	430.6 (11.4)	513.0 (13.6)	517.9 (13.8)	552.9 (14.7)	509.4 (13.5)	456.6 (12.1)	386.0 (10.3)

Table 92. Monthly Surface Area Wet Year (1997) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	8,596.0	8,320.1	8,319.6	8,346.9	8,238.0	8,367.5	8,271.6	8,460.2
Feb	9,117.0	8,908.2	8,907.3	8,927.6	8,840.2	8,942.9	8,869.3	9,012.5
Mar	8,999.4	8,791.0	8,796.9	8,812.3	8,721.2	8,831.9	8,749.7	8,919.1
Apr	7,867.9	7,602.6	7,609.7	7,629.2	7,493.1	7,654.1	7,538.4	7,770.0
May	7,048.8	6,913.9	6,916.5	6,924.4	6,878.1	6,934.3	6,892.6	6,991.3
Jun	9,876.5	9,695.6	9,700.6	9,715.4	9,627.6	9,734.2	9,655.1	9,817.1
Jul	7,862.9	7,644.1	7,649.9	7,668.2	7,551.6	7,691.4	7,593.5	7,800.9
Aug	9,249.4	9,148.7	9,151.7	9,160.6	9,109.6	9,171.3	9,129.5	9,222.5
Sep	8,703.0	8,539.2	8,544.8	8,560.4	8,471.8	8,579.0	8,508.5	8,668.0
Oct	8,917.2	8,798.4	8,796.2	8,810.9	8,738.1	8,827.2	8,767.3	8,907.2
Nov	9,991.9	9,881.5	9,879.9	9,893.9	9,824.7	9,909.5	9,852.5	9,983.0
Dec	10,024.9	9,924.1	9,922.3	9,936.3	9,867.0	9,951.9	9,894.7	10,014.6
Average	8,854.6	8,680.6	8,683.0	8,698.8	8,613.4	8,716.3	8,643.6	8,797.2
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	-0.5 (0.0)	26.8 (0.3)	-82.1 (-1.0)	47.4 (0.6)	-48.5 (-0.6)	140.1 (1.7)
Feb	---	---	-0.9 (0.0)	19.4 (0.2)	-67.9 (-0.8)	34.8 (0.4)	-38.9 (-0.4)	104.4 (1.2)
Mar	---	---	5.9 (0.1)	21.3 (0.2)	-69.9 (-0.8)	40.9 (0.5)	-41.4 (-0.5)	128.1 (1.5)
Apr	---	---	7.2 (0.1)	26.7 (0.4)	-109.4 (-1.4)	51.5 (0.7)	-64.2 (-0.8)	167.4 (2.2)
May	---	---	2.7 (0.0)	10.5 (0.2)	-35.8 (-0.5)	20.4 (0.3)	-21.3 (-0.3)	77.5 (1.1)
Jun	---	---	5.0 (0.1)	19.8 (0.2)	-68.0 (-0.7)	38.6 (0.4)	-40.5 (-0.4)	121.5 (1.3)
Jul	---	---	5.8 (0.1)	24.1 (0.3)	-92.4 (-1.2)	47.4 (0.6)	-50.6 (-0.7)	156.8 (2.1)
Aug	---	---	3.0 (0.0)	11.9 (0.1)	-39.1 (-0.4)	22.6 (0.2)	-19.2 (-0.2)	73.8 (0.8)
Sep	---	---	5.6 (0.1)	21.2 (0.2)	-67.4 (-0.8)	39.8 (0.5)	-30.7 (-0.4)	128.8 (1.5)
Oct	---	---	-2.2 (0.0)	12.5 (0.1)	-60.3 (-0.7)	28.8 (0.3)	-31.1 (-0.4)	108.8 (1.2)
Nov	---	---	-1.6 (0.0)	12.4 (0.1)	-56.8 (-0.6)	27.9 (0.3)	-29.0 (-0.3)	101.5 (1.0)
Dec	---	---	-1.8 (0.0)	12.2 (0.1)	-57.2 (-0.6)	27.7 (0.3)	-29.4 (-0.3)	90.5 (0.9)
Average	---	---	2.3 (0.0)	18.2 (0.2)	-67.2 (-0.8)	35.7 (0.4)	-37.1 (-0.4)	116.6 (1.3)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	-275.9 (-3.2)	-276.4 (-3.2)	-249.1 (-2.9)	-358.0 (-4.2)	-228.5 (-2.7)	-324.4 (-3.8)	-135.8 (-1.6)
Feb	---	-208.8 (-2.3)	-209.8 (-2.3)	-189.4 (-2.1)	-276.8 (-3.0)	-174.1 (-1.9)	-247.8 (-2.7)	-104.5 (-1.1)
Mar	---	-208.4 (-2.3)	-202.5 (-2.2)	-187.1 (-2.1)	-278.3 (-3.1)	-167.5 (-1.9)	-249.7 (-2.8)	-80.3 (-0.9)
Apr	---	-265.3 (-3.4)	-258.2 (-3.3)	-238.7 (-3.0)	-374.8 (-4.8)	-213.8 (-2.7)	-329.5 (-4.2)	-97.9 (-1.2)
May	---	-134.9 (-1.9)	-132.3 (-1.9)	-124.5 (-1.8)	-170.7 (-2.4)	-114.5 (-1.6)	-156.2 (-2.2)	-57.5 (-0.8)
Jun	---	-180.9 (-1.8)	-175.9 (-1.8)	-161.1 (-1.6)	-248.9 (-2.5)	-142.3 (-1.4)	-221.5 (-2.2)	-59.4 (-0.6)
Jul	---	-218.8 (-2.8)	-213.0 (-2.7)	-194.7 (-2.5)	-311.3 (-4.0)	-171.5 (-2.2)	-269.4 (-3.4)	-62.0 (-0.8)
Aug	---	-100.7 (-1.1)	-97.6 (-1.1)	-88.7 (-1.0)	-139.8 (-1.5)	-78.1 (-0.8)	-119.8 (-1.3)	-26.9 (-0.3)
Sep	---	-163.8 (-1.9)	-158.3 (-1.8)	-142.6 (-1.6)	-231.3 (-2.7)	-124.0 (-1.4)	-194.5 (-2.2)	-35.0 (-0.4)
Oct	---	-118.8 (-1.3)	-121.0 (-1.4)	-106.3 (-1.2)	-179.1 (-2.0)	-89.9 (-1.0)	-149.9 (-1.7)	-10.0 (-0.1)
Nov	---	-110.3 (-1.1)	-111.9 (-1.1)	-98.0 (-1.0)	-167.2 (-1.7)	-82.4 (-0.8)	-139.4 (-1.4)	-8.9 (-0.1)
Dec	---	-100.8 (-1.0)	-102.6 (-1.0)	-88.7 (-0.9)	-158.0 (-1.6)	-73.1 (-0.7)	-130.2 (-1.3)	-10.3 (-0.1)
Average	---	-174.0 (-2.0)	-171.6 (-1.9)	-155.7 (-1.8)	-241.2 (-2.7)	-138.3 (-1.6)	-211.0 (-2.4)	-57.4 (-0.6)

Table 93. Monthly Surface Area Dry Year (2004) – John Martin Reservoir (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Surface Area (acres)								
Jan	3,565.4	3,936.2	3,965.5	3,983.4	4,052.6	3,968.4	3,967.6	3,870.7
Feb	3,667.8	4,103.9	4,133.5	4,146.8	4,201.0	4,135.6	4,139.0	4,020.3
Mar	3,545.6	3,872.0	3,894.6	3,908.1	3,966.2	3,896.7	3,900.3	3,814.1
Apr	2,588.9	3,305.1	3,350.3	3,377.9	3,467.7	3,354.7	3,362.0	3,174.9
May	2,477.2	3,036.1	3,080.5	3,106.8	3,215.9	3,084.7	3,091.7	2,891.1
Jun	2,436.4	2,945.0	2,992.1	3,021.6	3,132.1	2,996.8	3,004.6	2,816.1
Jul	2,568.2	3,122.7	3,161.8	3,186.4	3,289.8	3,164.6	3,169.9	2,994.7
Aug	2,904.0	3,596.9	3,609.3	3,617.4	3,651.7	3,610.4	3,612.9	3,560.5
Sep	2,791.1	3,547.1	3,559.3	3,566.7	3,597.9	3,560.3	3,562.6	3,513.0
Oct	2,757.7	3,519.8	3,533.9	3,541.3	3,574.0	3,534.9	3,537.2	3,488.6
Nov	3,447.9	3,734.1	3,742.7	3,747.0	3,769.7	3,743.3	3,744.6	3,713.3
Dec	3,700.6	4,026.3	4,053.9	4,068.2	4,131.9	4,055.8	4,060.3	3,957.4
Average	3,037.6	3,562.1	3,589.8	3,606.0	3,670.9	3,592.2	3,596.1	3,484.6
Change in Surface Area Compared to No Action [acres (%)]								
Jan	---	---	29.3 (0.7)	47.1 (1.2)	116.4 (3.0)	32.1 (0.8)	31.4 (0.8)	-65.6 (-1.7)
Feb	---	---	29.6 (0.7)	42.8 (1.0)	97.0 (2.4)	31.7 (0.8)	35.1 (0.9)	-83.6 (-2.0)
Mar	---	---	22.6 (0.6)	36.2 (0.9)	94.2 (2.4)	24.8 (0.6)	28.4 (0.7)	-57.8 (-1.5)
Apr	---	---	45.2 (1.4)	72.7 (2.2)	162.6 (4.9)	49.6 (1.5)	56.9 (1.7)	-130.2 (-3.9)
May	---	---	44.3 (1.5)	70.6 (2.3)	179.8 (5.9)	48.5 (1.6)	55.5 (1.8)	-145.0 (-4.8)
Jun	---	---	47.1 (1.6)	76.5 (2.6)	187.1 (6.4)	51.8 (1.8)	59.6 (2.0)	-128.9 (-4.4)
Jul	---	---	39.1 (1.3)	63.7 (2.0)	167.1 (5.4)	41.9 (1.3)	47.1 (1.5)	-128.0 (-4.1)
Aug	---	---	12.3 (0.3)	20.5 (0.6)	54.8 (1.5)	13.4 (0.4)	16.0 (0.4)	-36.5 (-1.0)
Sep	---	---	12.2 (0.3)	19.6 (0.6)	50.8 (1.4)	13.1 (0.4)	15.5 (0.4)	-34.1 (-1.0)
Oct	---	---	14.2 (0.4)	21.5 (0.6)	54.2 (1.5)	15.1 (0.4)	17.5 (0.5)	-31.1 (-0.9)
Nov	---	---	8.6 (0.2)	12.9 (0.3)	35.7 (1.0)	9.2 (0.2)	10.5 (0.3)	-20.8 (-0.6)
Dec	---	---	27.6 (0.7)	41.9 (1.0)	105.6 (2.6)	29.5 (0.7)	34.0 (0.8)	-68.9 (-1.7)
Average	---	---	27.7 (0.8)	43.9 (1.2)	108.8 (3.1)	30.1 (0.8)	34.0 (1.0)	-77.5 (-2.2)
Change in Surface Area Compared to Existing Conditions [acres (%)]								
Jan	---	370.9 (10.4)	400.1 (11.2)	418.0 (11.7)	487.3 (13.7)	403.0 (11.3)	402.3 (11.3)	305.3 (8.6)
Feb	---	436.1 (11.9)	465.7 (12.7)	479.0 (13.1)	533.2 (14.5)	467.8 (12.8)	471.2 (12.8)	352.5 (9.6)
Mar	---	326.4 (9.2)	349.0 (9.8)	362.6 (10.2)	420.6 (11.9)	351.1 (9.9)	354.8 (10.0)	268.5 (7.6)
Apr	---	716.2 (27.7)	761.3 (29.4)	788.9 (30.5)	878.8 (33.9)	765.7 (29.6)	773.1 (29.9)	586.0 (22.6)
May	---	558.9 (22.6)	603.3 (24.4)	629.6 (25.4)	738.7 (29.8)	607.5 (24.5)	614.5 (24.8)	413.9 (16.7)
Jun	---	508.6 (20.9)	555.7 (22.8)	585.1 (24.0)	695.7 (28.6)	560.4 (23.0)	568.2 (23.3)	379.7 (15.6)
Jul	---	554.5 (21.6)	593.6 (23.1)	618.2 (24.1)	721.6 (28.1)	596.4 (23.2)	601.7 (23.4)	426.5 (16.6)
Aug	---	692.9 (23.9)	705.2 (24.3)	713.4 (24.6)	747.7 (25.7)	706.3 (24.3)	708.9 (24.4)	656.4 (22.6)
Sep	---	756.0 (27.1)	768.2 (27.5)	775.6 (27.8)	806.8 (28.9)	769.2 (27.6)	771.5 (27.6)	721.9 (25.9)
Oct	---	762.1 (27.6)	776.3 (28.1)	783.6 (28.4)	816.3 (29.6)	777.2 (28.2)	779.5 (28.3)	730.9 (26.5)
Nov	---	286.2 (8.3)	294.8 (8.5)	299.1 (8.7)	321.8 (9.3)	295.3 (8.6)	296.7 (8.6)	265.4 (7.7)
Dec	---	325.7 (8.8)	353.3 (9.5)	367.6 (9.9)	431.2 (11.7)	355.2 (9.6)	359.7 (9.7)	256.7 (6.9)
Average	---	524.5 (17.3)	552.2 (18.2)	568.4 (18.7)	633.3 (20.8)	554.6 (18.3)	558.5 (18.4)	447.0 (14.7)

Arkansas River Near Granada Gage Streamflow

Direct effects on Arkansas River near Granada gage streamflow are presented in Table 94 through Table 97. Monthly average direct effects range between minor decreases to minor increases when compared to the No Action Alternative. The Joint Use Pipeline North Alternative has lower Pueblo Reservoir storage contents than the No Action Alternative and is able to capture more “free river” water in high spill years (e.g. mid-1980s, mid-1990s), whereas the other alternatives pass this water down through John Martin Reservoir and past the Granada gage. The Joint Use Pipeline North Alternative shows more minor decreases than the other alternatives on an overall average monthly basis.

Direct effects in typical normal, wet, and dry years are predominately negligible, though occasional minor effects occur in low flow periods (e.g. September) during the summer conservation storage season. During the summer conservation storage season, flows downstream from John Martin Reservoir are more sensitive to flow changes occurring upstream from John Martin Reservoir, as the reservoir does not store water except during high inflow conditions. Since Colorado District 67 demands remain constant between the alternatives, negligible effects on streamflow upstream from John Martin Reservoir can change to minor effects downstream from John Martin Reservoir as flow decreases in the downstream direction.

Cumulative effects on Arkansas River near Granada gage streamflow are presented in Table 98 through Table 101. Monthly average cumulative effects are negligible for all alternatives when compared to the No Action Alternative, except for the Pueblo Dam North Alternative, which has a minor two cfs increase in streamflow in March. Cumulative effects in typical normal, wet, and dry years are predominately negligible, though occasional minor and moderate effects occur in low flow periods (e.g. September and October) during the summer conservation storage season, as explained above for direct effects.

Table 94. Monthly Streamflow Overall Average – Arkansas River near Granada (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	111	112	113	113	112	113	113	113
Feb	116	114	112	112	109	112	115	119
Mar	103	104	104	104	99	104	104	107
Apr	166	170	173	173	169	173	174	175
May	322	328	330	329	331	331	331	335
Jun	339	343	343	343	343	343	343	344
Jul	483	485	488	481	465	487	488	491
Aug	199	201	202	202	199	202	202	204
Sep	93	94	94	94	94	94	94	94
Oct	70	71	70	70	71	70	71	70
Nov	88	88	88	88	88	88	88	88
Dec	113	113	113	113	113	113	113	113
Average	184	186	187	186	183	187	187	188
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	1 (0.9)	1 (0.9)	0 (0.0)	1 (0.9)	1 (0.9)	1 (0.9)
Feb	---	---	-2 (-1.8)	-2 (-1.8)	-5 (-4.4)	-2 (-1.8)	1 (0.9)	5 (4.4)
Mar	---	---	0 (0.0)	0 (0.0)	-5 (-4.8)	0 (0.0)	0 (0.0)	3 (2.9)
Apr	---	---	3 (1.8)	3 (1.8)	-1 (-0.6)	3 (1.8)	4 (2.4)	5 (2.9)
May	---	---	2 (0.6)	1 (0.3)	3 (0.9)	3 (0.9)	3 (0.9)	7 (2.1)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Jul	---	---	3 (0.6)	-4 (-0.8)	-20 (-4.1)	2 (0.4)	3 (0.6)	6 (1.2)
Aug	---	---	1 (0.5)	1 (0.5)	-2 (-1.0)	1 (0.5)	1 (0.5)	3 (1.5)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	-1 (-1.4)	-1 (-1.4)	0 (0.0)	-1 (-1.4)	0 (0.0)	-1 (-1.4)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	1 (0.4)	0 (0.1)	-3 (-1.4)	1 (0.4)	1 (0.6)	2 (1.3)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	1 (0.9)	2 (1.8)	2 (1.8)	1 (0.9)	2 (1.8)	2 (1.8)	2 (1.8)
Feb	---	-2 (-1.7)	-4 (-3.4)	-4 (-3.4)	-7 (-6.0)	-4 (-3.4)	-1 (-0.9)	3 (2.6)
Mar	---	1 (1.0)	1 (1.0)	1 (1.0)	-4 (-3.9)	1 (1.0)	1 (1.0)	4 (3.9)
Apr	---	4 (2.4)	7 (4.2)	7 (4.2)	3 (1.8)	7 (4.2)	8 (4.8)	9 (5.4)
May	---	6 (1.9)	8 (2.5)	7 (2.2)	9 (2.8)	9 (2.8)	9 (2.8)	13 (4.0)
Jun	---	4 (1.2)	4 (1.2)	4 (1.2)	4 (1.2)	4 (1.2)	4 (1.2)	5 (1.5)
Jul	---	2 (0.4)	5 (1.0)	-2 (-0.4)	-18 (-3.7)	4 (0.8)	5 (1.0)	8 (1.7)
Aug	---	2 (1.0)	3 (1.5)	3 (1.5)	0 (0.0)	3 (1.5)	3 (1.5)	5 (2.5)
Sep	---	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)
Oct	---	1 (1.4)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	1 (1.4)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	2 (0.9)	2 (1.2)	2 (0.9)	-1 (-0.5)	2 (1.3)	3 (1.5)	4 (2.2)

Table 95. Monthly Streamflow Normal Year (2005) – Arkansas River near Granada (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	46	46	46	46	46	46	46	46
Feb	52	52	52	52	52	52	52	52
Mar	42	42	42	42	42	42	42	42
Apr	38	38	38	38	38	38	38	38
May	273	273	273	273	273	273	273	273
Jun	390	389	389	389	389	389	389	389
Jul	473	473	473	473	473	473	473	473
Aug	53	59	60	60	60	60	60	59
Sep	9	13	13	13	13	13	13	12
Oct	18	18	18	18	18	18	18	18
Nov	7	7	7	7	7	7	7	7
Dec	52	52	52	52	52	52	52	52
Average	122	123	123	123	123	123	123	122
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	1 (1.7)	1 (1.7)	1 (1.7)	1 (1.7)	1 (1.7)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-7.7)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.1)	0 (0.0)	0 (0.1)	0 (-0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	6 (11.3)	7 (13.2)	7 (13.2)	7 (13.2)	7 (13.2)	7 (13.2)	6 (11.3)
Sep	---	4 (44.4)	4 (44.4)	4 (44.4)	4 (44.4)	4 (44.4)	4 (44.4)	3 (33.3)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.6)	1 (0.5)

Table 96. Monthly Streamflow Wet Year (1997) – Arkansas River near Granada (Direct Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	147	147	147	147	147	147	147	147
Feb	147	147	147	147	147	147	147	147
Mar	267	267	267	267	267	267	267	267
Apr	297	297	297	297	297	297	297	297
May	150	150	150	150	150	150	150	150
Jun	190	190	190	190	190	190	190	190
Jul	804	804	804	804	804	804	804	804
Aug	701	701	701	701	701	701	701	701
Sep	195	195	195	195	195	195	195	195
Oct	194	194	194	194	194	194	194	194
Nov	307	307	307	307	307	307	307	307
Dec	534	534	534	534	534	534	534	534
Average	330	330	330	330	330	330	330	330
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 97. Monthly Streamflow Dry Year (2004) – Arkansas River near Granada (Direct Effects)

Month	Existing Conditions	No Action		Comanche South		Pueblo Dam South		JUP North		Pueblo Dam North		River South		Master Contract Only	
Simulated Streamflow (cfs)															
Jan	30	30		30		30		30		30		30		30	
Feb	29	29		29		29		29		29		29		29	
Mar	67	67		67		67		67		67		67		67	
Apr	312	312		312		312		312		312		312		312	
May	35	35		35		35		35		35		35		35	
Jun	102	107		108		108		108		108		107		107	
Jul	70	70		70		70		70		70		70		70	
Aug	75	75		75		75		75		75		75		75	
Sep	19	19		19		19		19		19		19		19	
Oct	23	22		22		22		22		22		22		23	
Nov	36	36		36		36		36		36		36		36	
Dec	44	44		44		44		44		44		44		44	
Average	70	70		70		70		70		70		70		70	
Change in Flow Compared to No Action [cfs (%)]															
Jan	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	---		1	(0.9)	1	(0.9)	1	(0.9)	1	(0.9)	0	(0.0)	0	(0.0)
Jul	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	1	(4.5)
Nov	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	---		0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]															
Jan	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Feb	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Mar	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Apr	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
May	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Jun	---	5	(4.9)	6	(5.9)	6	(5.9)	6	(5.9)	6	(5.9)	5	(4.9)	5	(4.9)
Jul	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Aug	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sep	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Oct	---	-1	(-4.3)	-1	(-4.3)	-1	(-4.3)	-1	(-4.3)	-1	(-4.3)	-1	(-4.3)	0	(0.0)
Nov	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dec	---	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Average	---	0	(0.6)	0	(0.6)	0	(0.6)	0	(0.6)	0	(0.6)	0	(0.6)	0	(0.6)

Table 98. Monthly Streamflow Overall Average – Arkansas River near Granada (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	111	103	102	103	103	103	103	104
Feb	116	107	107	107	106	107	107	107
Mar	103	91	93	93	92	93	92	92
Apr	166	163	163	163	163	163	163	163
May	322	291	291	291	286	291	290	296
Jun	339	323	325	324	321	325	325	326
Jul	483	435	437	436	434	436	435	436
Aug	199	192	193	193	192	193	192	193
Sep	93	94	94	94	94	94	94	94
Oct	70	70	71	71	70	71	71	70
Nov	88	88	88	88	88	88	88	88
Dec	113	113	113	113	113	113	113	113
Average	184	173	174	174	172	174	173	174
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	-1 (-1.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)
Feb	---	---	0 (0.0)	0 (0.0)	-1 (-0.9)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	2 (2.2)	2 (2.2)	1 (1.1)	2 (2.2)	1 (1.1)	1 (1.1)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	-5 (-1.7)	0 (0.0)	-1 (-0.3)	5 (1.7)
Jun	---	---	2 (0.6)	1 (0.3)	-2 (-0.6)	2 (0.6)	2 (0.6)	3 (0.9)
Jul	---	---	2 (0.5)	1 (0.2)	-1 (-0.2)	1 (0.2)	0 (0.0)	1 (0.2)
Aug	---	---	1 (0.5)	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.5)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	1 (1.4)	1 (1.4)	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.3)	0 (0.2)	-1 (-0.4)	0 (0.3)	0 (0.1)	1 (0.6)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	-8 (-7.2)	-9 (-8.1)	-8 (-7.2)	-8 (-7.2)	-8 (-7.2)	-8 (-7.2)	-7 (-6.3)
Feb	---	-9 (-7.8)	-9 (-7.8)	-9 (-7.8)	-10 (-8.6)	-9 (-7.8)	-9 (-7.8)	-9 (-7.8)
Mar	---	-12 (-11.7)	-10 (-9.7)	-10 (-9.7)	-11 (-10.7)	-10 (-9.7)	-11 (-10.7)	-11 (-10.7)
Apr	---	-3 (-1.8)	-3 (-1.8)	-3 (-1.8)	-3 (-1.8)	-3 (-1.8)	-3 (-1.8)	-3 (-1.8)
May	---	-31 (-9.6)	-31 (-9.6)	-31 (-9.6)	-36 (-11.2)	-31 (-9.6)	-32 (-9.9)	-26 (-8.1)
Jun	---	-16 (-4.7)	-14 (-4.1)	-15 (-4.4)	-18 (-5.3)	-14 (-4.1)	-14 (-4.1)	-13 (-3.8)
Jul	---	-48 (-9.9)	-46 (-9.5)	-47 (-9.7)	-49 (-10.1)	-47 (-9.7)	-48 (-9.9)	-47 (-9.7)
Aug	---	-7 (-3.5)	-6 (-3.0)	-6 (-3.0)	-7 (-3.5)	-6 (-3.0)	-7 (-3.5)	-6 (-3.0)
Sep	---	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)	1 (1.1)
Oct	---	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)	1 (1.4)	1 (1.4)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	-11 (-6.0)	-11 (-5.7)	-11 (-5.8)	-12 (-6.4)	-11 (-5.8)	-11 (-5.9)	-10 (-5.5)

Table 99. Monthly Streamflow Normal Year (2005) – Arkansas River near Granada (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	46	46	46	46	46	46	46	46
Feb	52	52	52	52	52	52	52	52
Mar	42	42	42	42	42	42	42	42
Apr	38	38	38	38	38	38	38	38
May	273	273	273	273	273	273	273	273
Jun	390	389	389	389	389	389	389	389
Jul	473	473	473	473	473	473	473	473
Aug	53	59	59	59	59	59	59	59
Sep	9	19	19	18	18	18	18	17
Oct	18	18	18	18	18	18	18	18
Nov	7	7	7	7	7	7	7	7
Dec	52	52	52	52	52	52	52	52
Average	122	123	123	123	123	123	123	123
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	-1 (-5.3)	-1 (-5.3)	-1 (-5.3)	-1 (-5.3)	-2 (-10.5)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)	-1 (-0.3)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	6 (11.3)	6 (11.3)	6 (11.3)	6 (11.3)	6 (11.3)	6 (11.3)	6 (11.3)
Sep	---	10 (111.1)	10 (111.1)	9 (100.0)	9 (100.0)	9 (100.0)	9 (100.0)	8 (88.9)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	1 (0.9)	1 (0.9)	1 (0.9)	1 (0.8)	1 (0.9)	1 (0.9)	1 (0.8)

Table 100. Monthly Streamflow Wet Year (1997) – Arkansas River near Granada (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	147	147	147	147	147	147	147	147
Feb	147	147	147	147	147	147	147	147
Mar	267	267	267	267	267	267	267	267
Apr	297	297	297	297	297	297	297	297
May	150	150	150	150	150	150	150	150
Jun	190	190	190	190	190	190	190	190
Jul	804	804	804	804	804	804	804	804
Aug	701	701	701	701	701	701	701	701
Sep	195	195	195	195	195	195	195	195
Oct	194	194	194	194	194	194	194	194
Nov	307	307	307	307	307	307	307	307
Dec	534	534	534	534	534	534	534	534
Average	330	330	330	330	330	330	330	330
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 101. Monthly Streamflow Dry Year (2004) – Arkansas River near Granada (Cumulative Effects)

Month	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Simulated Streamflow (cfs)								
Jan	30	31	31	31	31	31	31	31
Feb	29	34	34	34	34	34	34	34
Mar	67	67	67	67	67	67	67	67
Apr	312	312	312	312	312	312	312	312
May	35	35	35	35	35	35	35	35
Jun	102	102	102	102	102	102	102	102
Jul	70	70	70	70	70	70	70	70
Aug	75	75	75	75	75	75	75	75
Sep	19	19	19	19	19	19	19	19
Oct	23	23	23	23	22	23	23	23
Nov	36	36	36	36	36	36	36	36
Dec	44	44	44	44	44	44	44	44
Average	70	70	70	70	70	70	70	70
Change in Flow Compared to No Action [cfs (%)]								
Jan	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Feb	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mar	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	---	0 (0.0)	0 (0.0)	-1 (-4.3)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	---	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (-0.1)	0 (0.0)
Change in Flow Compared to Existing Conditions [cfs (%)]								
Jan	---	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)
Feb	---	5 (17.2)	5 (17.2)	5 (17.2)	5 (17.2)	5 (17.2)	5 (17.2)	5 (17.2)
Mar	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apr	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
May	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jun	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jul	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Aug	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Sep	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Oct	---	0 (0.0)	0 (0.0)	0 (0.0)	-1 (-4.3)	0 (0.0)	0 (0.0)	0 (0.0)
Nov	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dec	---	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	---	0 (0.7)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.6)	0 (0.7)

Lower Arkansas River Transit Loss Analysis

Changes in streamflow would affect transit losses incurred in the river. In general, transit losses typically increase as a percentage of streamflow as streamflow decreases, and decrease as a percentage of streamflow as streamflow increases. Calculations based on recent transit loss studies to determine the full effects of alternatives on transit loss are presented. This was done to ensure that the simplifications necessary in the Daily Model analysis to assess transit loss do not significantly misconstrue the effect of transit loss on streamflow.

Methods

The study area for the transit loss analysis is the Arkansas River between Pueblo Reservoir and John Martin Reservoir. Although transit losses occur in all stream reaches analyzed in the EIS, other reaches were not identified in the scoping process as reaches of concern. Furthermore, changes in transit losses in the Arkansas River below Pueblo Reservoir affect streamflow to John Martin Reservoir, and ultimately, the Colorado-Kansas state line.

The Daily Model assesses transit loss to all flow in the river at a constant percentage based on typical flow conditions (see Appendix D.3). Any variance from the average transit loss condition is implicitly accounted for in ungaged gains and losses calculated from historical streamflow, inflows and diversions. As long as simulated streamflow remains in the same range as historical streamflow, the model simulates transit losses within the overall accuracy of the model. Because transit losses could vary between alternatives (based on changes in streamflow), this analysis was developed to estimate overall transit loss for each alternative, so that effects of changes in transit loss for each alternative can be calculated.

A transit loss study in the Lower Arkansas River was recently conducted (Livingston 2011) to evaluate losses incurred by Pueblo Reservoir releases delivered to ditch headgates on the Arkansas River above John Martin Reservoir and to John Martin Reservoir. The study developed transit losses for deliveries of water to three different locations (Catlin Canal, Fort Lyon Canal and John Martin Reservoir) at three different antecedent flow conditions (low, average and high), and four different reservoir release rates (100 cfs for 10 days and 20 days duration, and 400 cfs for 10 days and 20 days duration). A summary of antecedent flow conditions and transit losses from the study is in Table 102. For purposes of this analysis, the “10 percent rule” (the specific time required for the release discharge to diminish to less than 10 percent of its maximum rate at the diversion point) and 400 cfs for 10 day release conditions were used, resulting in the second highest transit loss for the 4 release rates.

Table 102. Summary of Antecedent Flow and Transit Loss from Transit Loss Study

Antecedent Flow Condition			Median Antecedent Flow at Gage (cfs)				Transit Loss [1]		
			Above Pueblo (Pueblo Res.)	Catlin	Ft Lyon (La Junta Gage)	John Martin (Las Animas Gage)	Pueblo Reservoir to Catlin Canal [2] (%)	Pueblo Reservoir to Fort Lyon Canal [2] (%)	Pueblo Reservoir to John Martin Reservoir [3] (%)
Low	Median	Apr-02	161.0	101.0	12.0	25.0	8.50	13.90	20.60
Med	Average	2000-2008	471.0	424.5	165.1	166.1	6.60	10.70	15.30
High	Median	Apr-98	655.5	943.0	395.0	493.5	4.60	7.50	9.40

Source: Livingston 2011
Notes:
(1) All transit losses for 400 cfs at 10 day duration reservoir release rate.
(2) Transit loss for 10% rule.
(3) Transit loss for 5% rule.

Using information from the transit loss study, transit losses within three reaches of the Arkansas River between Pueblo Reservoir and John Martin Reservoir were calculated, including the Pueblo Reservoir to the Catlin gage, Catlin gage to La Junta gage, and La Junta gage to Las Animas gage. For each of the three reaches, a linear relationship was developed between the total flow condition (antecedent flow plus reservoir release) and the calculated incremental transit loss in the reach shown in Table 102. This linear relationship was extended back to the zero flow condition using the same linear relationship, and extended forward to higher streamflow than the maximum measured flow at the minimum calculated transit loss percentage (Table 103 and Figure 25). These linear relationships for estimating transit loss were then applied to average daily simulated flow in each reach. Average daily simulated flow in the reach was calculated as the average of the upstream and downstream gage, consistent with the methodology used to calculate average total flow in the reach in Table 103.

Table 103. Methods for Calculating Transit Loss in Reach

Measure	Flow Condition	Pueblo Reservoir to Catlin Canal	Catlin Canal to La Junta Gage	La Junta Gage to Las Animas Gage
Total Flow (cfs) (Average of U/S and D/S antecedent flow + reservoir release)	Low	531	457	419
	Med	848	695	566
	High	1,200	1,069	845
Transit Loss from Pueblo Res	Low	8.5%	13.9%	20.6%
	Med	6.6%	10.7%	15.3%
	High	4.6%	7.5%	9.4%
Incremental Transit Loss %	Low	8.5%	5.4%	6.7%
	Med	6.6%	4.1%	4.6%
	High	4.6%	2.9%	1.9%
Linear Estimation (y = mx+b)	Slope (m)	-5.831E-05	-4.003E-05	-1.106E-04
	Intercept (b)	0.1158	0.0710	0.1114

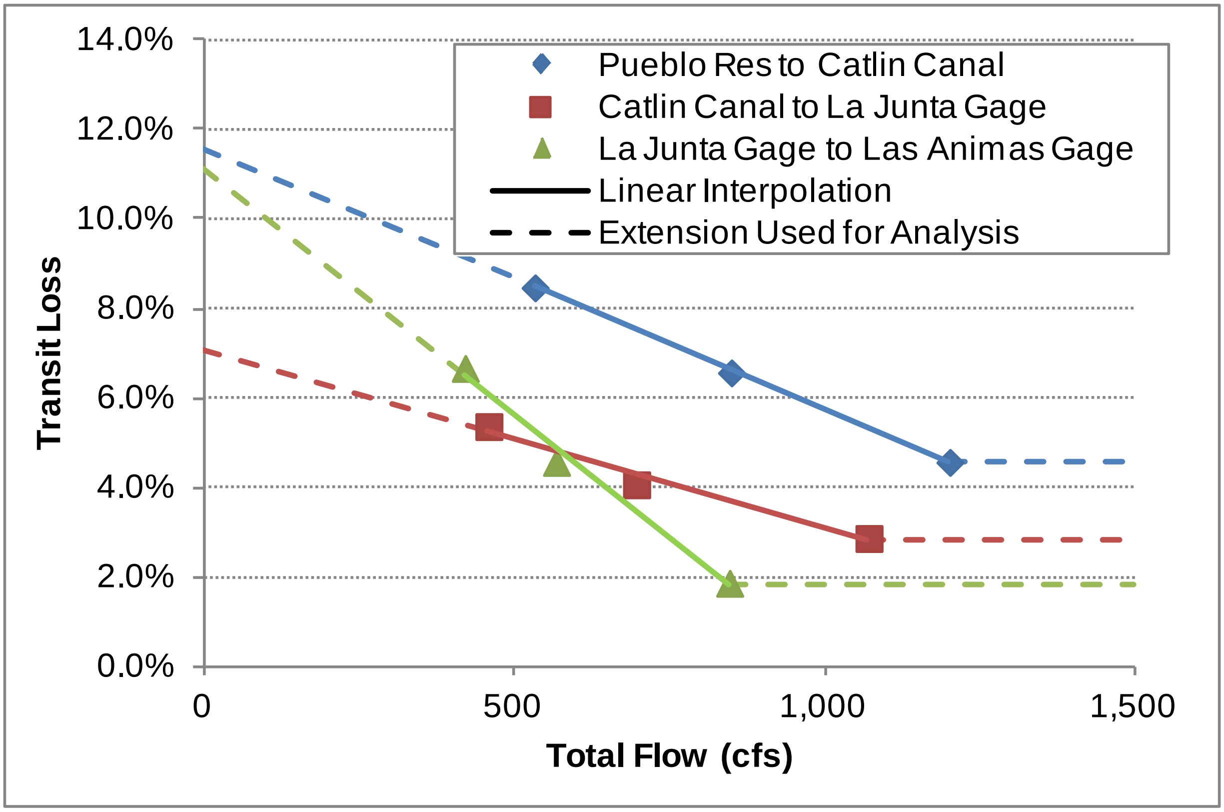


Figure 25. Relationship of Total Flow and Transit Loss Used in Analysis

Results

Direct and cumulative effects of alternatives on transit losses in the Lower Arkansas Valley are presented in this section. Consistent with the definition of direct and cumulative effects described in Chapter 4 of the EIS, direct and cumulative effects are calculated based on a comparison with the No Action Alternative. Comparisons with existing conditions are also provided in the tables, but not used to determine effects.

Summaries of direct and cumulative transit loss effects are presented in Table 104 and Table 105. More specific data pertaining to each river reach, as well as changes in transit loss percentages, are presented in the following sub-sections for overall average conditions and typical dry, normal and wet years.

Table 104. Summary of Daily Transit Loss Analysis – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Change in Volumetric Transit Loss Compared to No Action [ac-ft (%)]								
Overall Average	-	-	-498 (-0.9)	-517 (-0.9)	-539 (-0.9)	-494 (-0.9)	-192 (-0.3)	49 (0.1)
Dry Year	-	-	-519 (-1.5)	-494 (-1.4)	-481 (-1.3)	-507 (-1.4)	-61 (-0.2)	61 (0.2)
Normal Year	-	-	-598 (-1.3)	-536 (-1.2)	-457 (-1.0)	-585 (-1.3)	-285 (-0.6)	-77 (-0.2)
Wet Year	-	-	-179 (-0.2)	-166 (-0.2)	-268 (-0.4)	-154 (-0.2)	56 (0.1)	156 (0.2)
Change in Volumetric Transit Loss Compared to Existing Conditions [ac-ft (%)]								
Overall Average	-	-227 (-0.4)	-725 (-1.2)	-744 (-1.3)	-766 (-1.3)	-721 (-1.2)	-419 (-0.7)	-177 (-0.3)
Dry Year	-	-205 (-0.6)	-724 (-2.0)	-698 (-1.9)	-686 (-1.9)	-712 (-2.0)	-266 (-0.7)	-144 (-0.4)
Normal Year	-	-708 (-1.5)	-1,306 (-2.8)	-1,243 (-2.6)	-1,165 (-2.5)	-1,293 (-2.7)	-992 (-2.1)	-784 (-1.7)
Wet Year	-	-169 (-0.2)	-348 (-0.5)	-334 (-0.4)	-436 (-0.6)	-323 (-0.4)	-113 (-0.1)	-13 (0.0)
Percent Transit Loss								
Overall Average	16.0	16.1	16.1	16.1	16.1	16.1	16.1	16.0
Dry Year	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Normal Year	14.6	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Wet Year	20.6	20.7	20.7	20.7	20.8	20.7	20.6	20.6

Table 105. Summary of Daily Transit Loss Analysis – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Change in Volumetric Transit Loss Compared to No Action [ac-ft (%)]								
Overall Average	-	-	-359 (-0.7)	-359 (-0.7)	-432 (-0.8)	-360 (-0.7)	-193 (-0.4)	20 (0.0)
Dry Year	-	-	38 (0.1)	84 (0.2)	-139 (-0.4)	64 (0.2)	-53 (-0.2)	29 (0.1)
Normal Year	-	-	74 (0.2)	57 (0.1)	-30 (-0.1)	44 (0.1)	-205 (-0.5)	118 (0.3)
Wet Year	-	-	-289 (-0.4)	-278 (-0.4)	-305 (-0.4)	-269 (-0.4)	-55 (-0.1)	86 (0.1)
Change in Volumetric Transit Loss Compared to Existing Conditions [ac-ft (%)]								
Overall Average	-	-3,706 (-6.4)	-4,065 (-7.0)	-4,065 (-7.0)	-4,138 (-7.1)	-4,066 (-7.0)	-3,899 (-6.7)	-3,686 (-6.3)
Dry Year	-	-1,839 (-5.1)	-1,801 (-5.0)	-1,756 (-4.9)	-1,978 (-5.5)	-1,776 (-4.9)	-1,893 (-5.3)	-1,810 (-5.0)
Normal Year	-	-4,109 (-8.7)	-4,035 (-8.5)	-4,052 (-8.6)	-4,139 (-8.8)	-4,065 (-8.6)	-4,314 (-9.1)	-3,991 (-8.4)
Wet Year	-	-3,726 (-4.9)	-4,015 (-5.3)	-4,004 (-5.3)	-4,031 (-5.3)	-3,995 (-5.3)	-3,781 (-5.0)	-3,640 (-4.8)
Percent Transit Loss								
Overall Average	16.0	16.4	16.4	16.4	16.5	16.4	16.4	16.4
Typical Dry Year	18.3	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Typical Normal Year	14.6	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Typical Wet Year	20.6	21.5	21.5	21.5	21.5	21.5	21.5	21.5

Changes in average annual volumetric transit loss for all reaches and all alternatives are negligible (Table 106). The reach between Pueblo Dam and the Catlin gage shows the largest changes between the alternatives and both the No Action Alternative and existing conditions. There is no change in average annual transit loss percentages between the alternatives and the No Action Alternative (Table 107). Only the Joint Use Pipeline North Alternative results in a 0.1 percent increase in average annual transit loss percentage for the entire reach.

A scatter plot shows that the total average annual volumetric transit loss decreases as average annual streamflow decreases, while average percent transit loss increases while average annual streamflow decreases (Figure 26). Percent transit varies between 0.06 percent greater and 0.04 percent less than the No Action Alternative. These differences are not reflected in the values previously shown (Table 107), because the values in the table are rounded to reflect the accuracy of the analysis.

Changes in annual volumetric transit loss from the No Action Alternative for typical normal, wet and dry years by reach range from minor decreases to negligible increases (Table 108, Table 110 and Table 112). The largest changes occur in the Pueblo Reservoir to Catlin reach, which shows minor decreases for most AVC alternatives that divert directly from Pueblo Dam during the typical normal and dry years (2005 and 2004) due to decreases in streamflow through these reaches. There is no change in annual transit loss percentage during typical normal and wet years, and a 0.1 percent increase in transit loss percent for the Joint Use Pipeline North Alternative in the Pueblo Reservoir to Catlin reach for dry years (Table 109, Table 111 and Table 113)

Table 106. Summary of Overall Average Annual Volumetric Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	497,151	487,513	479,621	479,515	479,857	479,551	485,007	487,023
Catlin to La Junta	372,502	371,570	369,640	369,341	367,363	369,646	369,860	373,345
La Junta to Las Animas	221,943	225,001	225,717	225,315	223,032	225,778	226,003	227,259
Total	363,881	361,377	358,342	358,073	356,766	358,340	360,306	362,558
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	31,592	31,157	30,690	30,686	30,766	30,691	31,000	31,096
Catlin to La Junta	15,715	15,724	15,649	15,643	15,593	15,650	15,650	15,772
La Junta to Las Animas	11,022	11,222	11,265	11,256	11,204	11,267	11,260	11,283
Total	58,329	58,102	57,605	57,585	57,563	57,608	57,911	58,152
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-466 (-1.5)	-471 (-1.5)	-391 (-1.3)	-466 (-1.5)	-157 (-0.5)	-61 (-0.2)
Catlin to La Junta	-	-	-75 (-0.5)	-81 (-0.5)	-131 (-0.8)	-74 (-0.5)	-74 (-0.5)	48 (0.3)
La Junta to Las Animas	-	-	44 (0.4)	35 (0.3)	-18 (-0.2)	46 (0.4)	38 (0.3)	62 (0.5)
Total	-	-	-498 (-0.9)	-517 (-0.9)	-539 (-0.9)	-494 (-0.9)	-192 (-0.3)	49 (0.1)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-436 (-1.4)	-902 (-2.9)	-907 (-2.9)	-826 (-2.6)	-901 (-2.9)	-592 (-1.9)	-496 (-1.6)
Catlin to La Junta	-	9 (0.1)	-66 (-0.4)	-72 (-0.5)	-121 (-0.8)	-65 (-0.4)	-64 (-0.4)	58 (0.4)
La Junta to Las Animas	-	199 (1.8)	243 (2.2)	234 (2.1)	181 (1.6)	245 (2.2)	238 (2.2)	261 (2.4)
Total	-	-227 (-0.4)	-725 (-1.2)	-744 (-1.3)	-766 (-1.3)	-721 (-1.2)	-419 (-0.7)	-177 (-0.3)

Table 107. Summary of Overall Average Annual Percent Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Catlin to La Junta	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
La Junta to Las Animas	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total	16.0	16.1	16.1	16.1	16.1	16.1	16.1	16.0
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.1	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Catlin to La Junta	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total	-	0.0	0.0	0.1	0.1	0.0	0.0	0.0

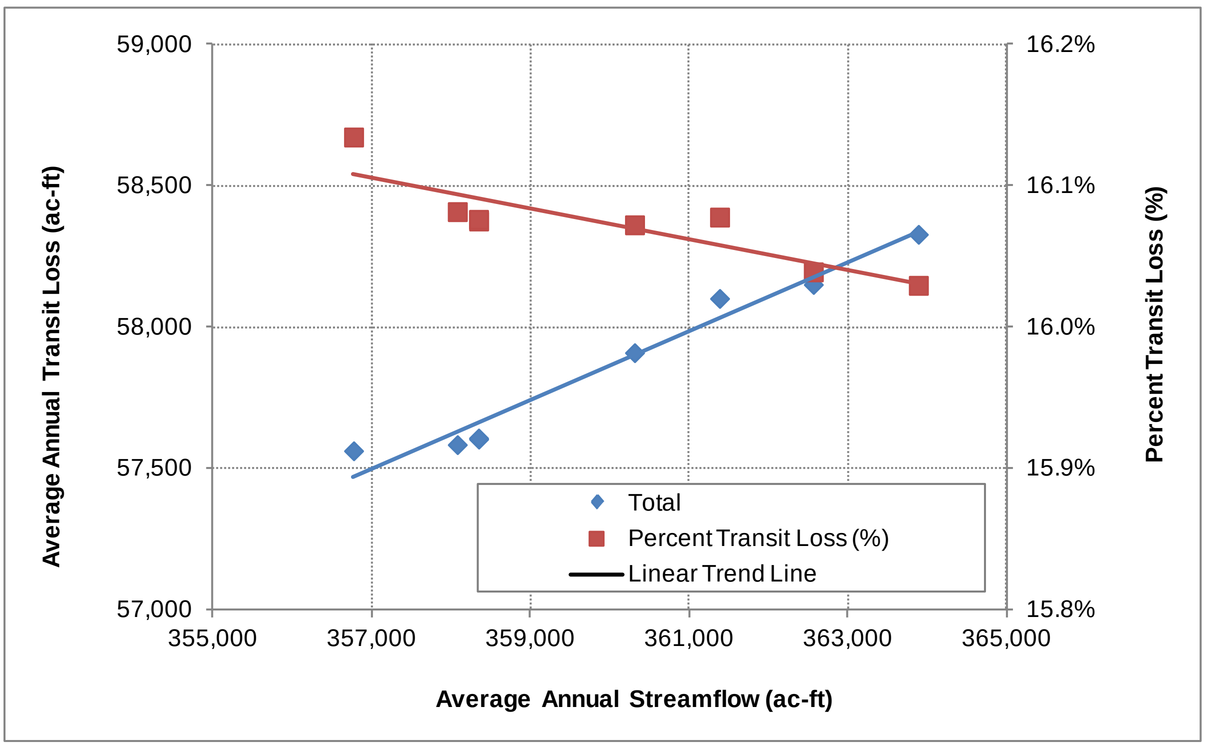


Figure 26. Scatter Plot of Average Annual Streamflow and Transit Loss – Direct Effects Streamflows

Table 108. Summary of Typical Normal Year (2005) Annual Volumetric Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	370,645	359,539	350,649	350,639	353,407	350,617	355,948	357,763
Catlin to La Junta	280,565	278,556	276,024	276,416	276,084	276,030	275,652	278,530
La Junta to Las Animas	124,209	125,497	125,836	126,206	125,584	125,914	125,603	125,730
Total	258,473	254,531	250,836	251,087	251,692	250,854	252,401	254,008
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	25,581	24,866	24,351	24,362	24,508	24,356	24,681	24,779
Catlin to La Junta	12,603	12,510	12,420	12,445	12,411	12,421	12,406	12,519
La Junta to Las Animas	9,050	9,150	9,157	9,183	9,150	9,164	9,154	9,150
Total	47,233	46,526	45,928	45,990	46,069	45,941	46,241	46,449
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-515 (-2.1)	-504 (-2.0)	-358 (-1.4)	-511 (-2.1)	-185 (-0.7)	-87 (-0.3)
Catlin to La Junta	-	-	-90 (-0.7)	-65 (-0.5)	-99 (-0.8)	-89 (-0.7)	-104 (-0.8)	9 (0.1)
La Junta to Las Animas	-	-	7 (0.1)	33 (0.4)	0 (0.0)	14 (0.2)	4 (0.0)	1 (0.0)
Total	-	-	-598 (-1.3)	-536 (-1.2)	-457 (-1.0)	-585 (-1.3)	-285 (-0.6)	-77 (-0.2)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-715 (-2.8)	-1,230 (-4.8)	-1,219 (-4.8)	-1,073 (-4.2)	-1,225 (-4.8)	-900 (-3.5)	-802 (-3.1)
Catlin to La Junta	-	-93 (-0.7)	-183 (-1.4)	-157 (-1.2)	-192 (-1.5)	-181 (-1.4)	-196 (-1.6)	-84 (-0.7)
La Junta to Las Animas	-	100 (1.1)	107 (1.2)	133 (1.5)	100 (1.1)	114 (1.3)	104 (1.2)	101 (1.1)
Total	-	-708 (-1.5)	-1,306 (-2.8)	-1,243 (-2.6)	-1,165 (-2.5)	-1,293 (-2.7)	-992 (-2.1)	-784 (-1.7)

Table 109. Summary of Typical Normal Year (2005) Annual Percent Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Catlin to La Junta	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
La Junta to Las Animas	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Total	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 110. Summary of Typical Wet Year (1997) Annual Volumetric Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	709,172	695,366	692,463	692,554	689,240	692,603	697,715	698,413
Catlin to La Junta	511,279	509,827	509,211	509,363	507,997	509,392	509,244	511,370
La Junta to Las Animas	325,535	329,410	329,545	329,690	329,624	329,705	329,558	329,384
Total	515,328	511,534	510,406	510,536	508,954	510,567	512,172	513,055
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	41,814	41,394	41,241	41,237	41,151	41,244	41,469	41,517
Catlin to La Junta	20,498	20,495	20,467	20,475	20,447	20,477	20,470	20,540
La Junta to Las Animas	13,047	13,303	13,304	13,314	13,326	13,316	13,309	13,291
Total	75,360	75,191	75,012	75,025	74,923	75,037	75,247	75,347
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-153 (-0.4)	-157 (-0.4)	-243 (-0.6)	-149 (-0.4)	75 (0.2)	123 (0.3)
Catlin to La Junta	-	-	-28 (-0.1)	-20 (-0.1)	-48 (-0.2)	-18 (-0.1)	-25 (-0.1)	45 (0.2)
La Junta to Las Animas	-	-	1 (0.0)	11 (0.1)	23 (0.2)	13 (0.1)	6 (0.0)	-12 (-0.1)
Total	-	-	-179 (-0.2)	-166 (-0.2)	-268 (-0.4)	-154 (-0.2)	56 (0.1)	156 (0.2)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-421 (-1.0)	-573 (-1.4)	-577 (-1.4)	-663 (-1.6)	-570 (-1.4)	-346 (-0.8)	-298 (-0.7)
Catlin to La Junta	-	-3 (0.0)	-31 (-0.2)	-24 (-0.1)	-52 (-0.3)	-22 (-0.1)	-28 (-0.1)	41 (0.2)
La Junta to Las Animas	-	255 (2.0)	257 (2.0)	267 (2.0)	278 (2.1)	269 (2.1)	261 (2.0)	244 (1.9)
Total	-	-169 (-0.2)	-348 (-0.5)	-334 (-0.4)	-436 (-0.6)	-323 (-0.4)	-113 (-0.1)	-13 (0.0)

Table 111. Summary of Typical Wet Year (1997) Annual Percent Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	5.9	6.0	6.0	6.0	6.0	6.0	5.9	5.9
Catlin to La Junta	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
La Junta to Las Animas	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total	14.6	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Catlin to La Junta	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 112. Summary of Typical Dry Year (2004) Annual Volumetric Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	243,570	235,959	227,946	228,332	228,386	228,085	234,589	234,342
Catlin to La Junta	164,380	164,247	162,825	163,106	161,483	162,916	164,188	165,819
La Junta to Las Animas	115,965	119,101	120,244	120,211	120,107	120,318	120,589	120,309
Total	174,638	173,102	170,338	170,550	169,992	170,439	173,122	173,490
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	19,254	18,795	18,224	18,239	18,328	18,228	18,607	18,664
Catlin to La Junta	8,351	8,397	8,349	8,361	8,294	8,350	8,397	8,487
La Junta to Las Animas	8,355	8,563	8,664	8,663	8,653	8,670	8,690	8,666
Total	35,961	35,756	35,237	35,262	35,275	35,249	35,695	35,817
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-571 (-3.0)	-556 (-3.0)	-467 (-2.5)	-567 (-3.0)	-188 (-1.0)	-131 (-0.7)
Catlin to La Junta	-	-	-48 (-0.6)	-37 (-0.4)	-104 (-1.2)	-47 (-0.6)	0 (0.0)	90 (1.1)
La Junta to Las Animas	-	-	101 (1.2)	99 (1.2)	90 (1.1)	107 (1.2)	127 (1.5)	102 (1.2)
Total	-	-	-519 (-1.5)	-494 (-1.4)	-481 (-1.3)	-507 (-1.4)	-61 (-0.2)	61 (0.2)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-459 (-2.4)	-1,030 (-5.3)	-1,015 (-5.3)	-926 (-4.8)	-1,026 (-5.3)	-647 (-3.4)	-590 (-3.1)
Catlin to La Junta	-	46 (0.6)	-2 (0.0)	9 (0.1)	-58 (-0.7)	-1 (0.0)	46 (0.6)	136 (1.6)
La Junta to Las Animas	-	208 (2.5)	309 (3.7)	307 (3.7)	298 (3.6)	315 (3.8)	335 (4.0)	310 (3.7)
Total	-	-205 (-0.6)	-724 (-2.0)	-698 (-1.9)	-686 (-1.9)	-712 (-2.0)	-266 (-0.7)	-144 (-0.4)

Table 113. Summary of Typical Dry Year (2004) Annual Percent Transit Loss – Direct Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	7.9	8.0	8.0	8.0	8.0	8.0	7.9	8.0
Catlin to La Junta	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
La Junta to Las Animas	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Total	20.6	20.7	20.7	20.7	20.8	20.7	20.6	20.6
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.1	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.1	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Catlin to La Junta	-	0.0	0.0	0.0	0.1	0.0	0.0	0.0
La Junta to Las Animas	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	0.1	0.1	0.1	0.2	0.1	0.0	0.1

In the cumulative effects analysis, all alternatives except the Master Contract Only Alternative result in a negligible decrease in overall average annual volumetric transit loss (Table 114) when compared with the No Action Alternative. All alternatives result in a negligible decrease in transit loss for the Pueblo Reservoir to Catlin reach, and a negligible increase in transit loss in the La Junta to Las Animas reach. All alternatives except the Master Contract Only Alternative result in a negligible decrease in transit loss in the Catlin to La Junta reach. When compared with existing conditions, all alternatives show a decrease in overall transit loss and in the Pueblo Reservoir to Catlin and Catlin to La Junta reaches, and an increase in the La Junta to Las Animas reach.

When compared with the No Action Alternative, none of the alternatives show a change in transit loss percentage for any of the reaches in the cumulative effects analysis (Table 115). When compared with existing conditions, all alternatives result in a 0.1 to 0.4 percent increase in transit loss percentage for all reaches.

Typical normal, wet and dry years also show negligible changes in volumetric transit loss when compared with the No Action Alternative for all reaches except the La Junta to Las Animas reach where the Comanche-South, Pueblo Dam-South and Pueblo Dam-North alternatives result in a minor increase in transit loss (Table 116, Table 118 and Table 120). All alternatives show a decrease in average annual transit loss for all reaches when compared with existing conditions during normal years. During wet years, transit losses are less in the Pueblo Reservoir to Catlin and Catlin to La Junta reaches, and greater in the La Junta to Las Animas reach. During dry years, transit losses are less in the Pueblo Reservoir to Catlin reach, and greater in the Catlin to La Junta and La Junta to Las Animas reaches.

During all years, transit loss percentages are the same as the No Action Alternative for nearly all reaches and alternatives (Table 117, Table 119 and Table 121). Percentages differ within 0.1 percent. When compared with existing conditions, transit loss percentages vary from a 0.1 decrease to a 1.2 percent increase. The largest differences occur during dry years in the Pueblo Reservoir to Catlin reach, which shows a 1.1 to 1.2 percent increase from existing conditions for all alternatives.

Table 114. Summary of Overall Average Annual Volumetric Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	497,151	425,872	419,377	419,136	418,825	419,337	423,723	425,145
Catlin to La Junta	372,502	354,271	352,602	352,452	351,443	352,595	351,863	354,697
La Junta to Las Animas	221,943	217,849	218,301	218,310	217,382	218,296	217,712	218,606
Total	363,881	332,678	330,107	329,980	329,230	330,090	331,113	332,830
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	31,592	28,123	27,788	27,786	27,776	27,789	28,009	28,105
Catlin to La Junta	15,715	15,249	15,196	15,196	15,159	15,197	15,164	15,266
La Junta to Las Animas	11,022	11,251	11,280	11,283	11,257	11,277	11,257	11,272
Total	58,329	54,623	54,264	54,265	54,191	54,263	54,430	54,643
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-335 (-1.2)	-337 (-1.2)	-347 (-1.2)	-334 (-1.2)	-114 (-0.4)	-18 (-0.1)
Catlin to La Junta	-	-	-53 (-0.3)	-54 (-0.4)	-91 (-0.6)	-53 (-0.3)	-85 (-0.6)	17 (0.1)
La Junta to Las Animas	-	-	29 (0.3)	32 (0.3)	6 (0.1)	26 (0.2)	6 (0.1)	21 (0.2)
Total	-	-	-359 (-0.7)	-359 (-0.7)	-432 (-0.8)	-360 (-0.7)	-193 (-0.4)	20 (0.0)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-3,469 (-11.0)	-3,804 (-12.0)	-3,806 (-12.0)	-3,816 (-12.1)	-3,803 (-12.0)	-3,583 (-11.3)	-3,488 (-11.0)
Catlin to La Junta	-	-465 (-3.0)	-518 (-3.3)	-519 (-3.3)	-556 (-3.5)	-518 (-3.3)	-550 (-3.5)	-448 (-2.9)
La Junta to Las Animas	-	229 (2.1)	258 (2.3)	260 (2.4)	234 (2.1)	255 (2.3)	234 (2.1)	250 (2.3)
Total	-	-3,706 (-6.4)	-4,065 (-7.0)	-4,065 (-7.0)	-4,138 (-7.1)	-4,066 (-7.0)	-3,899 (-6.7)	-3,686 (-6.3)

Table 115. Summary of Overall Average Annual Percent Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	6.4	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Catlin to La Junta	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3
La Junta to Las Animas	5.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Total	16.0	16.4	16.4	16.4	16.5	16.4	16.4	16.4
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Catlin to La Junta	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1
La Junta to Las Animas	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Table 116. Summary of Typical Normal Year (2005) Annual Volumetric Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	370,645	308,012	307,589	307,349	306,727	307,399	308,601	310,118
Catlin to La Junta	280,565	268,530	269,501	269,637	269,186	269,569	266,893	269,515
La Junta to Las Animas	124,209	122,040	124,130	123,911	123,709	123,858	121,903	122,371
Total	258,473	232,860	233,740	233,632	233,207	233,609	232,466	234,001
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	25,581	22,160	22,084	22,080	22,028	22,073	22,079	22,222
Catlin to La Junta	12,603	12,151	12,177	12,185	12,174	12,181	12,048	12,171
La Junta to Las Animas	9,050	8,813	8,938	8,916	8,893	8,915	8,793	8,850
Total	47,233	43,125	43,198	43,182	43,095	43,168	42,920	43,242
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-76 (-0.3)	-80 (-0.4)	-132 (-0.6)	-88 (-0.4)	-82 (-0.4)	61 (0.3)
Catlin to La Junta	-	-	26 (0.2)	34 (0.3)	23 (0.2)	30 (0.2)	-103 (-0.8)	20 (0.2)
La Junta to Las Animas	-	-	124 (1.4)	103 (1.2)	79 (0.9)	101 (1.1)	-20 (-0.2)	36 (0.4)
Total	-	-	74 (0.2)	57 (0.1)	-30 (-0.1)	44 (0.1)	-205 (-0.5)	118 (0.3)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-3,421 (-13.4)	-3,497 (-13.7)	-3,501 (-13.7)	-3,553 (-13.9)	-3,508 (-13.7)	-3,502 (-13.7)	-3,359 (-13.1)
Catlin to La Junta	-	-452 (-3.6)	-426 (-3.4)	-417 (-3.3)	-429 (-3.4)	-422 (-3.3)	-555 (-4.4)	-431 (-3.4)
La Junta to Las Animas	-	-236 (-2.6)	-112 (-1.2)	-134 (-1.5)	-157 (-1.7)	-135 (-1.5)	-257 (-2.8)	-200 (-2.2)
Total	-	-4,109 (-8.7)	-4,035 (-8.5)	-4,052 (-8.6)	-4,139 (-8.8)	-4,065 (-8.6)	-4,314 (-9.1)	-3,991 (-8.4)

Table 117. Summary of Typical Normal Year (2005) Annual Percent Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	6.9	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Catlin to La Junta	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
La Junta to Las Animas	7.3	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Total	18.3	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	-0.1	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Catlin to La Junta	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Total	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 118. Summary of Typical Wet Year (1997) Annual Volumetric Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	709,172	623,692	619,229	619,619	618,948	619,517	624,664	625,562
Catlin to La Junta	511,279	498,447	498,192	497,905	496,292	498,152	497,688	500,716
La Junta to Las Animas	325,535	329,661	329,116	328,869	329,503	328,964	329,381	329,715
Total	515,328	483,933	482,179	482,131	481,581	482,211	483,911	485,331
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	41,814	38,230	38,009	38,049	38,010	38,036	38,243	38,258
Catlin to La Junta	20,498	20,089	20,052	20,042	20,014	20,053	20,035	20,133
La Junta to Las Animas	13,047	13,315	13,284	13,265	13,306	13,275	13,301	13,329
Total	75,360	71,634	71,345	71,356	71,329	71,365	71,579	71,720
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-221 (-0.6)	-182 (-0.5)	-220 (-0.6)	-194 (-0.5)	13 (0.0)	28 (0.1)
Catlin to La Junta	-	-	-37 (-0.2)	-47 (-0.2)	-75 (-0.4)	-35 (-0.2)	-54 (-0.3)	45 (0.2)
La Junta to Las Animas	-	-	-31 (-0.2)	-50 (-0.4)	-9 (-0.1)	-40 (-0.3)	-14 (-0.1)	13 (0.1)
Total	-	-	-289 (-0.4)	-278 (-0.4)	-305 (-0.4)	-269 (-0.4)	-55 (-0.1)	86 (0.1)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-3,584 (-8.6)	-3,805 (-9.1)	-3,766 (-9.0)	-3,804 (-9.1)	-3,778 (-9.0)	-3,571 (-8.5)	-3,556 (-8.5)
Catlin to La Junta	-	-410 (-2.0)	-446 (-2.2)	-456 (-2.2)	-485 (-2.4)	-445 (-2.2)	-464 (-2.3)	-365 (-1.8)
La Junta to Las Animas	-	268 (2.1)	237 (1.8)	218 (1.7)	258 (2.0)	228 (1.7)	254 (1.9)	281 (2.2)
Total	-	-3,726 (-4.9)	-4,015 (-5.3)	-4,004 (-5.3)	-4,031 (-5.3)	-3,995 (-5.3)	-3,781 (-5.0)	-3,640 (-4.8)

Table 119. Summary of Typical Wet Year (1997) Annual Percent Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	5.9	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Catlin to La Junta	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
La Junta to Las Animas	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total	14.6	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Catlin to La Junta	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 120. Summary of Typical Dry Year (2004) Annual Volumetric Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Average Annual Streamflow (ac-ft)								
Pueblo Res. to Catlin	243,570	178,508	174,441	174,663	174,938	174,832	177,658	177,676
Catlin to La Junta	164,380	163,487	164,256	164,674	163,263	164,674	162,047	163,637
La Junta to Las Animas	115,965	134,447	137,252	137,656	136,529	137,574	134,567	134,394
Total	174,638	158,814	158,650	158,998	158,243	159,027	158,091	158,569
Average Annual Transit Loss (ac-ft)								
Pueblo Res. to Catlin	19,254	16,083	15,858	15,867	15,836	15,861	16,051	16,082
Catlin to La Junta	8,351	8,731	8,805	8,823	8,733	8,818	8,675	8,756
La Junta to Las Animas	8,355	9,307	9,496	9,515	9,413	9,507	9,342	9,312
Total	35,961	34,121	34,160	34,205	33,983	34,185	34,068	34,150
Change Compared to No Action [ac-ft (%)]								
Pueblo Res. to Catlin	-	-	-225 (-1.4)	-216 (-1.3)	-247 (-1.5)	-222 (-1.4)	-33 (-0.2)	-1 (0.0)
Catlin to La Junta	-	-	75 (0.9)	92 (1.1)	3 (0.0)	87 (1.0)	-56 (-0.6)	25 (0.3)
La Junta to Las Animas	-	-	189 (2.0)	207 (2.2)	106 (1.1)	199 (2.1)	35 (0.4)	5 (0.1)
Total	-	-	38 (0.1)	84 (0.2)	-139 (-0.4)	64 (0.2)	-53 (-0.2)	29 (0.1)
Change Compared to Existing Conditions [ac-ft (%)]								
Pueblo Res. to Catlin	-	-3,171 (-16.5)	-3,396 (-17.6)	-3,387 (-17.6)	-3,418 (-17.8)	-3,393 (-17.6)	-3,203 (-16.6)	-3,172 (-16.5)
Catlin to La Junta	-	379 (4.5)	454 (5.4)	471 (5.6)	382 (4.6)	466 (5.6)	324 (3.9)	404 (4.8)
La Junta to Las Animas	-	952 (11.4)	1,141 (13.7)	1,160 (13.9)	1,058 (12.7)	1,152 (13.8)	987 (11.8)	957 (11.5)
Total	-	-1,839 (-5.1)	-1,801 (-5.0)	-1,756 (-4.9)	-1,978 (-5.5)	-1,776 (-4.9)	-1,893 (-5.3)	-1,810 (-5.0)

Table 121. Summary of Typical Dry Year (2004) Annual Percent Transit Loss – Cumulative Effects

Hydrologic Condition	Existing Conditions	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Percent Transit Loss (%)								
Pueblo Res. to Catlin	7.9	9.0	9.1	9.1	9.1	9.1	9.0	9.1
Catlin to La Junta	5.1	5.3	5.4	5.4	5.3	5.4	5.4	5.4
La Junta to Las Animas	7.2	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Total	20.6	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Change Compared to No Action (%)								
Pueblo Res. to Catlin	-	-	0.1	0.1	0.0	0.1	0.0	0.0
Catlin to La Junta	-	-	0.0	0.0	0.0	0.0	0.0	0.0
La Junta to Las Animas	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total	-	-	0.0	0.0	0.0	0.0	0.1	0.1
Change Compared to Existing Conditions (%)								
Pueblo Res. to Catlin	-	1.1	1.2	1.2	1.1	1.2	1.1	1.1
Catlin to La Junta	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3
La Junta to Las Animas	-	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Total	-	0.9	0.9	0.9	0.9	0.9	1.0	0.9

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