Appendix C2
Colorado Water Demand Scenario Quantification

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1.0 Introduction

This appendix summarizes the data sources used in scenario quantification for Colorado River demand[1] for the state of Colorado and presents the results of quantification. As presented in figure C2-1, Colorado is divided into a number of planning areas that align with river basins including the Colorado River and its tributaries (Yampa, White, Gunnison, Dolores, and San Juan Rivers) as well as the South Platte and Arkansas basins that are served by Colorado River water. Data collection and development were completed at the planning area level.

The following sections present background information that summarizes the state's planning areas as well as data sources used to quantify demand scenarios by category. Following the background section, results of demand scenario quantification are presented. The results section is broken out into a Colorado Study Area summary, followed by Colorado River demand by geography and finally by category.

2.0 Background

The Colorado Water Conservation Board (CWCB) is responsible for state-level water resource planning in Colorado. The CWCB has led numerous planning studies under the Statewide Water Supply Initiative (SWSI), leading to a number of available water supply planning reports. The SWSI process includes significant public and agency input for Colorado's water resource planning.

The CWCB coordinated Colorado's efforts to provide information for scenario quantification. These efforts largely relied on information previously generated through the SWSI. However, new assumptions and/or data development were required where the assumptions of the Colorado River Basin Water Supply and Demand Study (Study) deviated from the SWSI process.

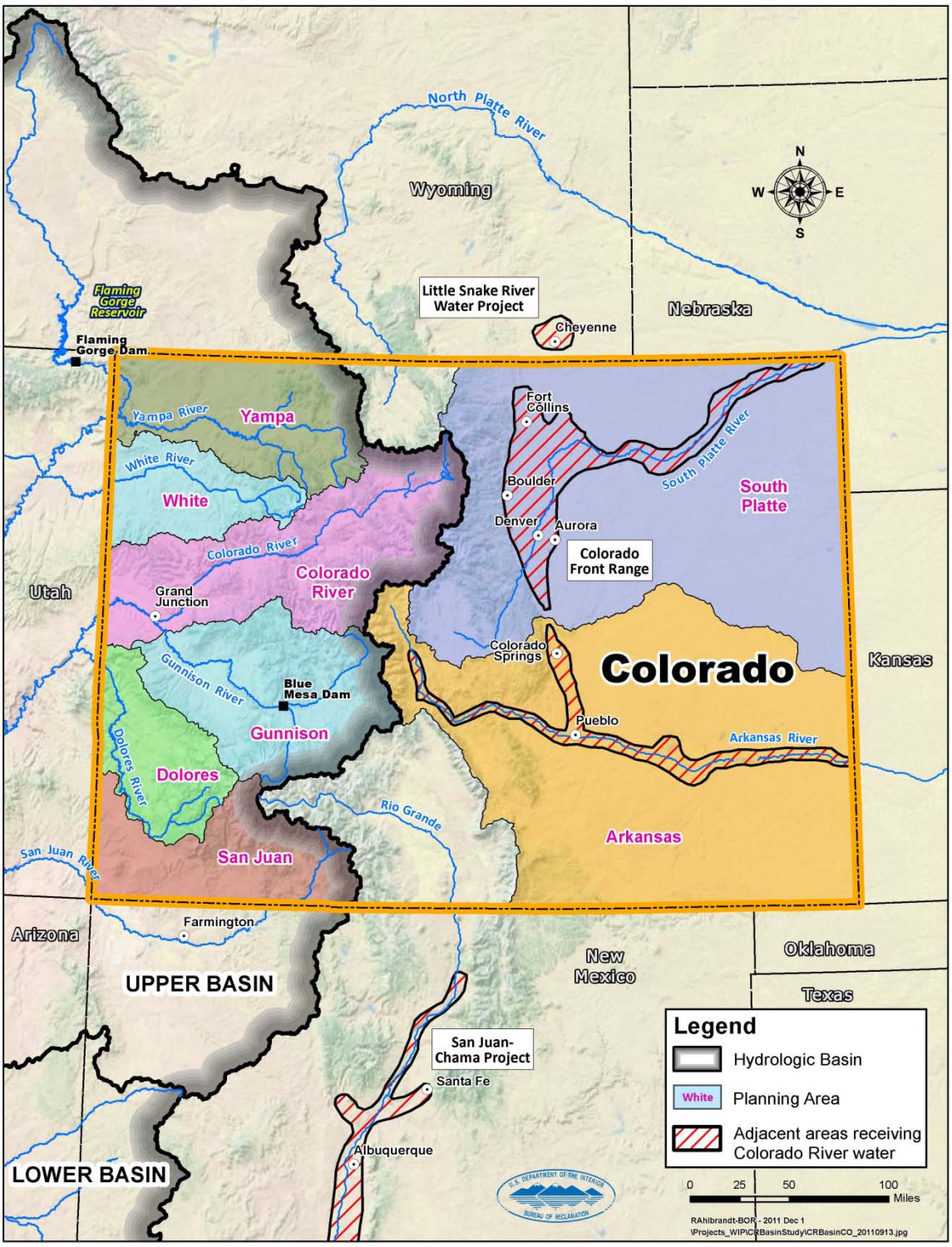
2.1 Data Sources for Quantification

This section discusses data sources for demand quantification by use category. Some category projections were based on relevant parameter data, while other category projections were developed directly as water demand. Sources include state, regional, and national agency reports.

- **Agricultural Demand:** Irrigated acreage estimates were derived from SWSI table 4-10 (CWCB, 2010a). The SWSI contemplated significant future transfers of agricultural lands and water rights to meet future demands. However, for the purposes of the Study, it was assumed that agricultural to municipal and industrial (M&I) transfers were only associated with physical land transfers due to urbanization, and not associated with additional dry-up outside urban corridors. This would allow increased M&I transfers to be considered as an option and strategy to meet supply and demand imbalances.

[1] Potential Colorado River demand as computed by Study Area demand minus other supplies.

FIGURE C2-1
Colorado River Hydrologic Basin and Export Service Areas in Colorado



- **M&I:** Population and per capita water use values were derived from the SWSI process. Population projection values for the Study scenarios were derived from the "low," "medium," and "high" values associated with the SWSI (table 4-1, page 4-4) and were interpolated or projected as necessary to reflect the dates reported in the Study (for example, SWSI data from 2035 and 2050 were interpolated to arrive at 2060 data for the Study). Per capita water use values were derived from "passive" and currently planned "active" conservation. Representatives from the Colorado River Water Conservation District and the Front Range Water Council reviewed the SWSI "passive" numbers in detail and concluded that the values include active measures. SWSI gallons per capita per day numbers were not used directly; the values used were provided through personal communication with the referenced entities and CWCB (CWCB, 2012).
- **Energy:** Energy demands were derived from SWSI table 4-8, with additional demands from Appendix F of the CWCB report, *2050 M&I Water User Projections* (CWCB, 2010b).
- **Minerals:** Demand for mineral production was derived from Upper Colorado River Commission Schedule of Colorado River demands from 2007. Water demand for mineral production was inadvertently excluded from the 2010 SWSI process.
- **Fish, Wildlife, and Recreation:** No water demands were noted for fish, wildlife, and recreation.
- **Tribal:** For Colorado, at the request of Ute Mountain Ute and Southern Ute Indian Tribes, tribal demands were not considered separately from the demand categories noted above. As such, tribal agricultural acreage, tribal populations, etc., are included in the other category estimates.

3.0 Results of Water Demand Scenario Quantification[2]

This section summarizes Colorado's Colorado River water demand trends by category across the scenarios. The purpose of this section is to describe changes in demands, both temporally and geographically, parameters that influence changes in demands, and how the parameters and demands differ among scenarios.

Demands were first developed for areas that may be potentially served by Colorado River water ("Study Area" demands); independent of the source of supply. However, for areas outside of the hydrologic basin, a portion of the Study Area demand is satisfied from other supplies, such as the Arkansas or South Platte rivers. To develop estimates of the Colorado River water demand, the Study Area demand was reduced by estimates of available supply from other sources. This appendix focuses on Colorado River demands, but includes discussion of the Study Area parameters that led to these demands.

[2] By definition, scenarios representing future, projected, estimated, or potential demands are uncertain and are only one possible realization of unknown events. All scenarios represent potential Colorado River Water demand. However, for readability purposes, potential Colorado River water demand will also be varyingly referred to as Colorado River demand, or in some cases, just demand.

Sections 3.1 through 3.3 summarize the results of demand scenario quantification, with section 3.1 presenting Study Area demand and Colorado River water demand in Colorado, section 3.2 presenting Colorado River Demand for the state and individual planning areas across the six scenarios, and section 3.3 presenting Colorado River water demand by category across the six scenarios. Parameters and demands for all categories and all scenarios, along with references for data sources, are detailed in tables C2-2 to C2-7 in section 3.4.

3.1 Summary Results of Scenario Quantification

Values were developed for parameters and demands quantified for each of the scenarios. Table C2-1 presents summary results for the demand scenarios considered in the Study. The table presents agricultural and M&I demand parameters for Colorado's Study Area, distinguishing the scenarios and the resulting Colorado River demands by category.

Colorado estimates that slightly fewer than 6 million people will be in Colorado's Study Area by 2015. This number is expected to increase to about 9 to 11 million by 2060. The greatest population growth is associated with the Rapid Growth (C1 and C2) scenarios and Enhanced Environment (D2). The Slow Growth (B) scenario has the lowest population growth of the scenarios (9.4 million by 2060), but still represents a growth of nearly 66 percent over 2015 estimates.

The growing municipal population, however, will continue to be more efficient in its per capita water use than today. Per capita water use, considering passive and active, or existing conservation levels, is expected to be 9 to 22 percent less in 2060 than in 2015. Although usage rates vary across Colorado's planning areas, per capita reductions are assumed to be consistent across the planning areas.

Irrigated acreage is projected to continue to decrease through 2060 under all scenarios. Under the Rapid Growth (C1 and C2) scenarios, projected irrigated acreage is reduced by about 420,000 acres. Irrigated acreage is reduced by 200,000 acres in the Enhanced Environment (D1) scenario, with reductions of less than 50,000 acres for the Current Projected (A), Slow Growth (B), and Enhanced Environment (D2) scenarios. These reductions in irrigated acreage are offset to some extent by increases in water delivery per acre as a result of more intense cultivation or full irrigation of remaining acreage, resulting in moderate decreases in demand for all scenarios but the Enhanced Environment (D2) scenario, in which demand increases by about 4 percent.

Water demands for energy and mineral categories are projected to increase under all scenarios. The growing need for energy sources (coal, solar, and oil shale) is projected to increase water demands. The largest increases in water demand for energy are anticipated in the Colorado River and White basins. Water needs for mineral extraction are projected to increase similarly in all planning areas except for the Front Range planning areas (South Platte and Arkansas), where water demands for mineral extraction are not identified, and the Dolores basin, where demands are small.

For Colorado, tribal demands are embedded in other categories and not represented under the tribal category.

TABLE C2-1
Summary Results of Colorado Water Demand Scenario Quantification by 2060

Key Study Area Demand Scenario Parameters							
	2015[1]	2060 Scenario Parameters					
		A	B	C1	C2	D1	D2
Population (millions)	5.7	9.9	9.4	11.1	11.1	9.9	11.1
Change in per capita water usage (%), from 2015	–	-9%	-9%	-9%	-20%	-22%	-20%
Irrigated acreage (millions of acres)	2.17	2.13	2.13	1.75	1.75	1.97	2.13
Change in per acre water delivery (%), from 2015	–	+0%	+0%	+2%	+12%	-3%	+8%
Study Area Demand (thousand acre-ft)							
	2015[1]	2060 Scenario Demands					
		A	B	C1	C2	D1	D2
Ag demand	6,132	5,991	5,991	4,775	5,252	5,692	6,367
M&I demand	1,139	1,701	1,630	1,891	1,637	1,429	1,637
Energy demand	76	195	135	255	135	128	135
Minerals demand	32	60	60	66	54	54	54
FWR demand	0	0	0	0	0	0	0
Tribal demand[2]	0	0	0	0	0	0	0
Total Study Area Demand[3]	**7,379**	**7,947**	**7,816**	**6,987**	**7,079**	**7,302**	**8,193**
Colorado River Demand (thousand acre-ft)							
	2015[1]	2060 Scenario Demands					
		A	B	C1	C2	D1	D2
Ag demand	1,875	1,875	1,875	1,728	1,867	1,606	2,029
M&I demand	455	732	661	1,007	931	711	890
Energy demand	30	118	58	178	58	58	58
Minerals demand	32	60	60	66	54	54	54
FWR demand	0	0	0	0	0	0	0
Tribal demand[2]	0	0	0	0	0	0	0
Total Colorado River Demand[3]	**2,391**	**2,784**	**2,653**	**2,979**	**2,910**	**2,428**	**3,030**

1. If range across scenarios is less than 10%, Current Projected (A) scenario is presented. Otherwise, range (min–max) is presented.
2. Tribal demands are included in other demand categories.
3. Excludes potential losses (reservoir evaporation, phreatophytes, and/or operational inefficiencies) that may be charged to state

Figure C2-2 presents demands across the scenarios in three panels as follows: 1) Study Area demand with other supplies and Colorado River demand[3] identified, 2) Colorado River demand, and 3) change in Colorado River demand by demand category.

From panel one it can be seen that Study Area demand increases from about 7 million acre-feet (maf) in 2015 to up to 8.2 maf by 2060. The demand change across scenarios in 2060 is projected to be as low as a reduction of 0.4 maf or as high as an increase of 0.8 maf. The growth in Colorado River demand from 2015 to 2060 is projected to be as much as 0.6 maf with the Front Range, and in particular the South Platte planning area, growing by about 60 percent. About 60 percent of the Study Area demand is expected to be met by other supplies.

Panel two provides a view of the range across scenarios of Colorado River demand. Colorado River demand increases from about 2.4 maf in 2015 to between 2.4 and 3.0 maf in 2060 (or 2 to 27 percent) depending on the scenario. This difference results in a Colorado River demand range of about 0.6 maf across the scenarios in 2060, or about 25 percentage points.

Panel three shows how specific categories affect the projected change in Colorado River demand by scenario. Although the single largest component of demand is agricultural (~70 percent), most of the growth in demand is driven by increases in M&I demand and more specifically by increases in population. Of the growing categories of Colorado River demand, between 70 and 90 percent of the growth is contributed by the M&I demand category. Some portion of this increase is generally offset by decreases in agricultural demand, except under the Current Projected (A) and Slow Growth (B) scenarios, in which agricultural demand is constant, and under the Enhanced Environment (D2) scenario, in which agricultural demand increases significantly due to greater water delivery per acre. Water for energy and mineral demand make up the remaining increases in demand, with a significant increase in energy demand under the Rapid Growth (C1) scenario due to increased demand for oil shale production.

Figure C2-3 ties historical water use to the range of Colorado River demand in the quantified scenarios. The 0.6 maf range across scenarios in 2060 is easily discernible, with a relatively even spread over the range across the scenarios. In addition, it appears that the quantified scenarios track well with the peaks in historical uses that likely represent the least supply-limited conditions or actual demand.

3.2 Colorado River Water Demand by Geography

Colorado River water demand for areas served by the Colorado River is presented in figures C2-4, C2-5, and C2-6. These figures show two geographic levels: Study Area in Colorado, and individual planning areas. Demands at each geographic level are shown across the scenarios. The columns to the right show the Colorado River demand at a point in time (2015, 2035, or 2060) by relative contribution of the categories.

[3] Losses due to reservoir evaporation are not part of this total.

FIGURE C2-2
Study Area, Colorado River, and Change in Colorado River Demand

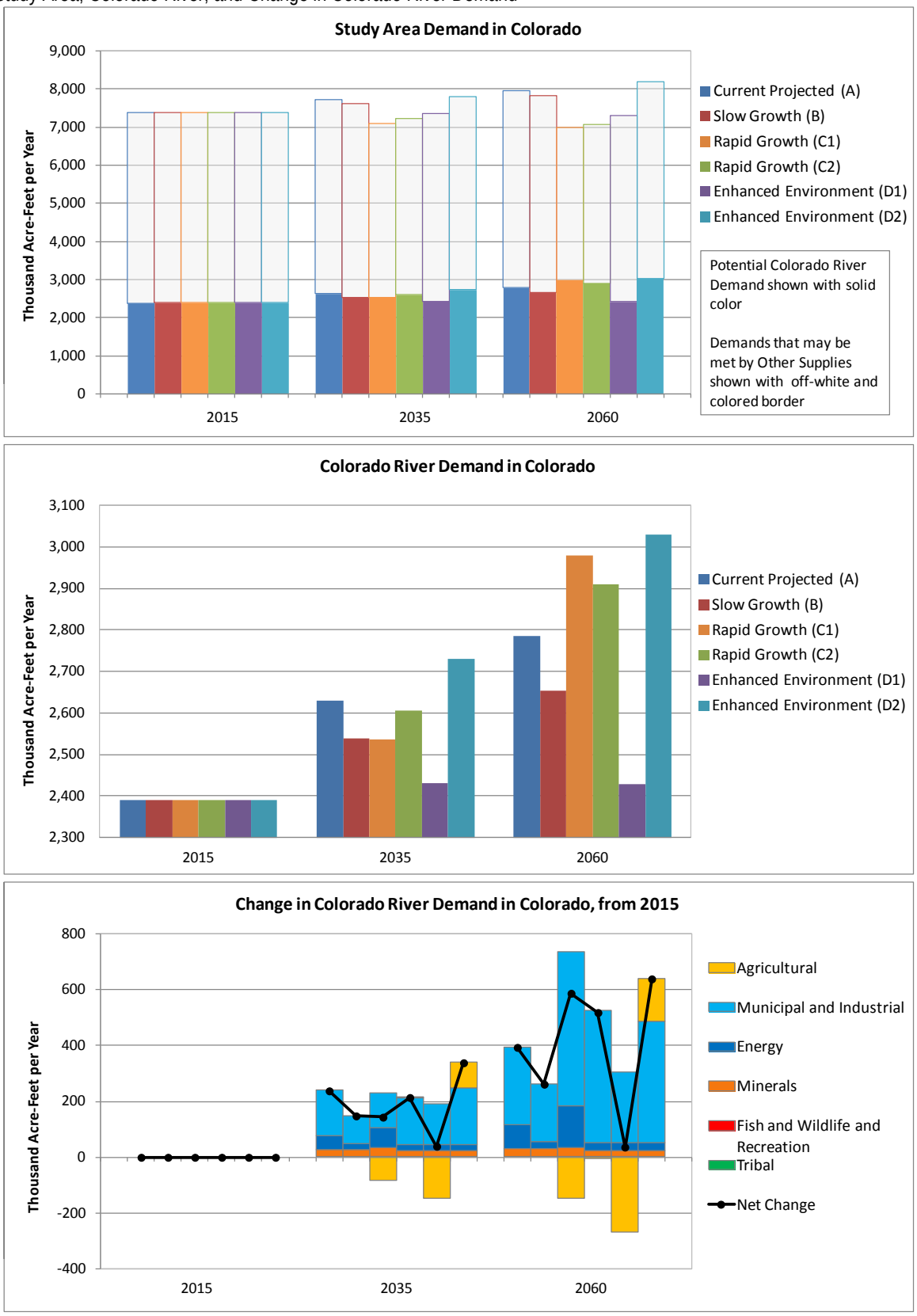
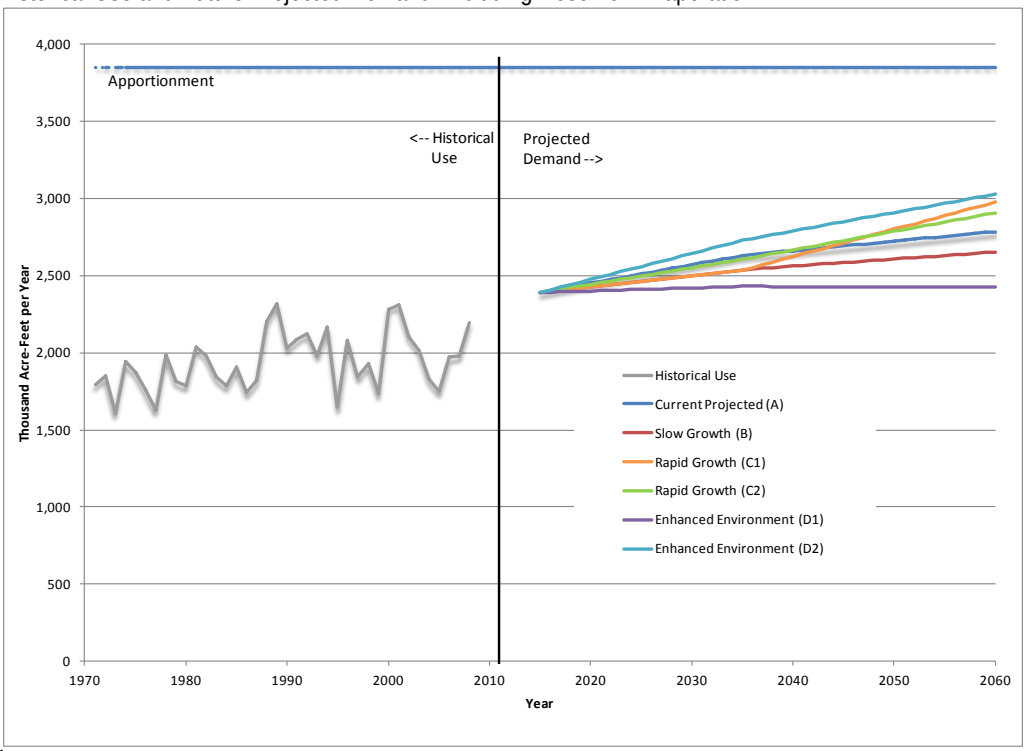


FIGURE C2-3
Historical Use and Future Projected Demand Excluding Reservoir Evaporation[1]



[1]Reservoir evaporation on the order of 430 thousand acre-feet is not included in this plot.

The change in both magnitude and percentage of Colorado River demand[4] varies considerably across the planning areas. The South Platte planning area shows the greatest magnitude and rate of overall growth in Colorado River demand from 2015 to 2060 across the scenarios, with between about 0.1 and 0.4 maf making up between 40 and 90 percent of the total growth in Colorado. This growth is primarily due to population growth, with between 70 and 90 percent of the increase in the growing sectors occurring in M&I demand. Demands for the Arkansas planning area are projected to grow by about 0.04 to about 0.14 maf, due to population growth. Demand in the Yampa planning area is projected to grow by between 0.03 and 0.04 maf, due primarily to growth in water demand for energy. The other planning areas consistently make up the remaining growth, with greater relative contributions (more than 20 percent of total growth) from the Colorado River and White planning areas under the Current Projected (A) and Rapid Growth (C1) scenarios, respectively, due primarily to growth in demand for energy.

When demands by category are examined in figure C2-5, the mix of demand categories varies between the hydrologic basin and adjacent areas, with agricultural demand dominating the hydrologic basin and M&I demand at 50 percent or greater in the two adjacent planning areas.

Figure C2-6 shows the change in Colorado River demand by category from 2015 across the scenarios. The mix of demand categories across the planning areas varies considerably, with change in demand in the South Platte and Arkansas dominated by M&I and a range of increases and significant decreases in agricultural demand varying by basin and scenario.

[4] Potential Colorado River demand is based on changes in parameters such as population and for the purpose of the Study is not limited by apportionment.

FIGURE C2-4
Colorado River Demand in Colorado

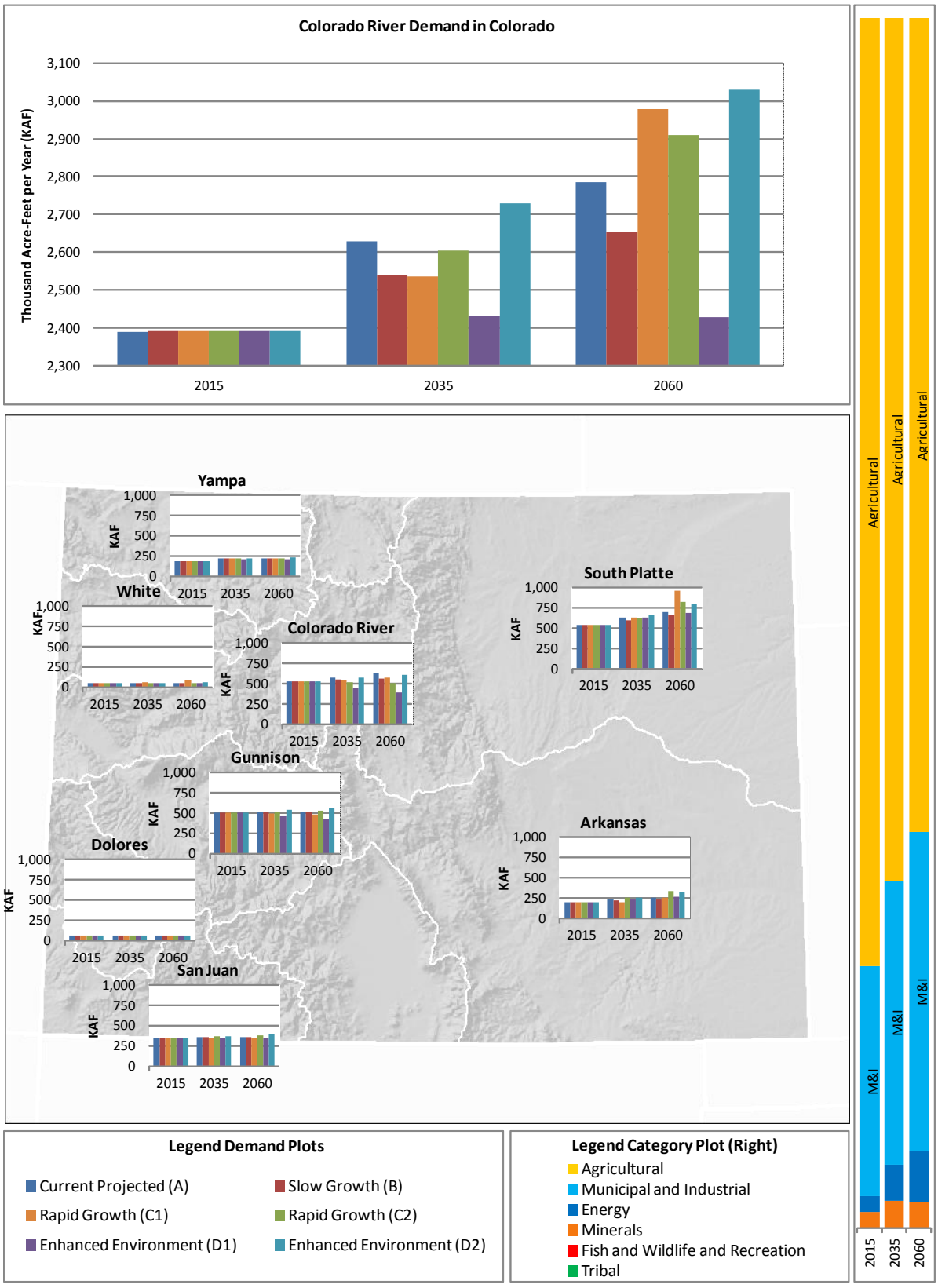


FIGURE C2-5
Colorado River Demand by Category

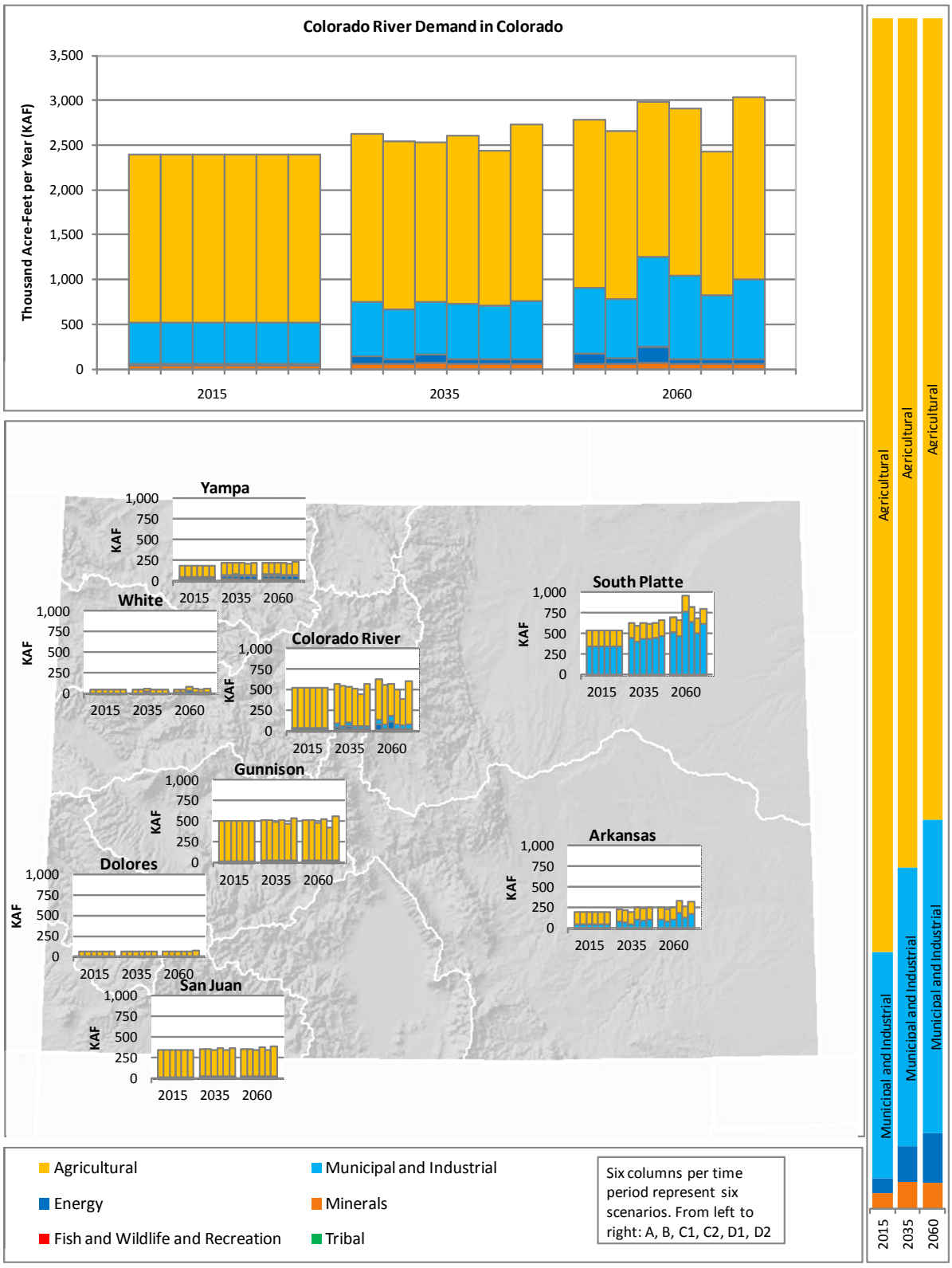
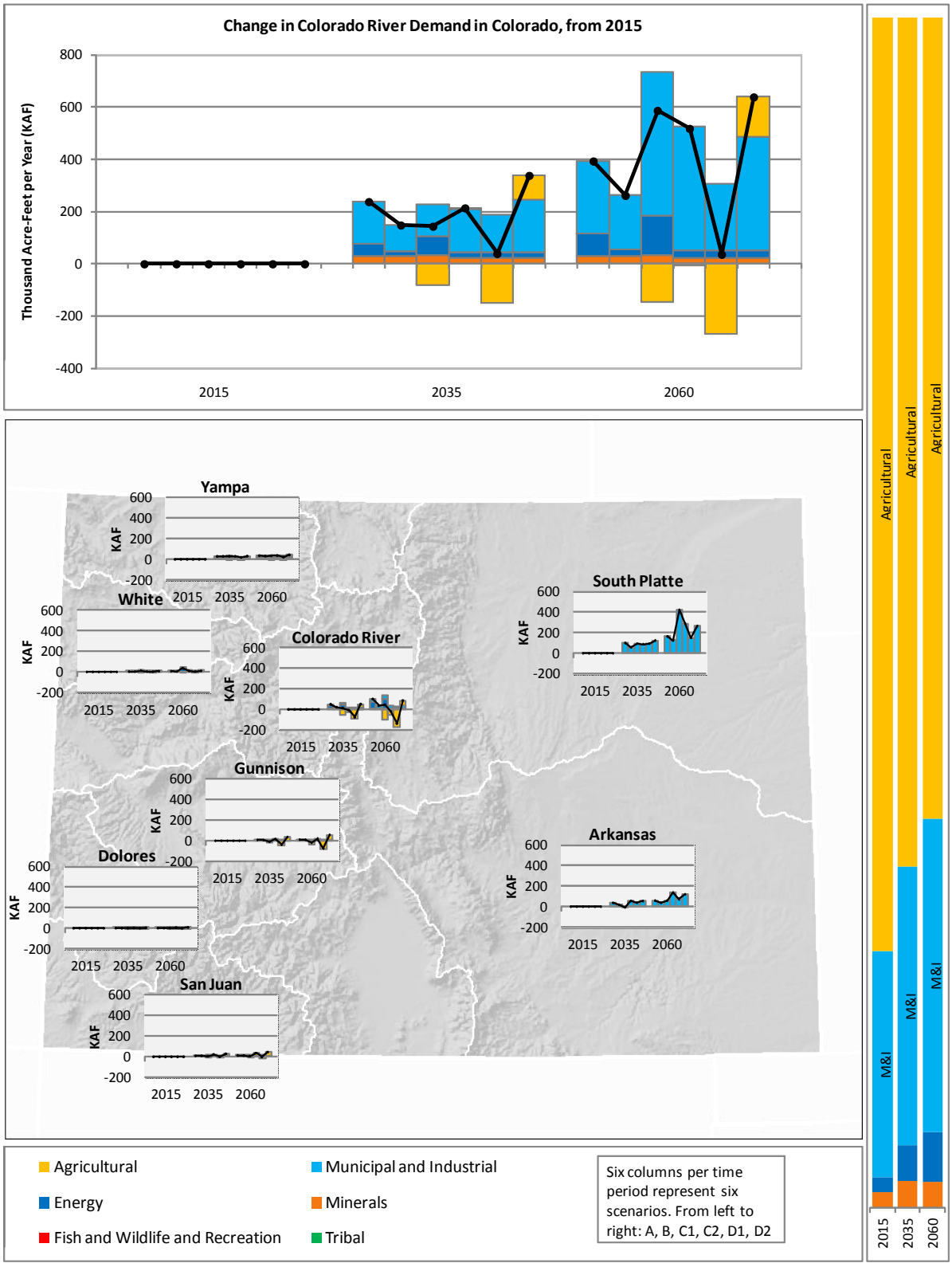


FIGURE C2-6
Change in Colorado River Demand in Colorado from 2015 by Category



3.3 Colorado River Demand by Category

3.3.1 Agriculture

Agricultural water demand is driven by irrigated acreage and water delivery per acre. Water delivery per acre is the amount of water diverted per irrigated acre. Components of this use include transmission and delivery losses (surface evaporation, riparian demand, and seepage), and on-farm losses that are made up of evaporation, crop irrigation requirements, and tail water (return). Each of these factors will vary by location (precipitation, growing season, etc.), irrigation method, and crop type.

Colorado River Simulation System (CRSS) does not represent smaller tributaries in Colorado. Inflow nodes are only included for the Mainstem Colorado, Gunnison, Yampa, San Juan, and White Rivers. Demands upstream of these inflow nodes are aggregated and represented at those same locations. A significant portion of the aggregated irrigation demands divert from the smaller tributaries and are unable to receive a full water supply during the irrigation seasons, due to either physical flow limitations or the need to bypass water to satisfy downstream senior demands. Because of CRSS limitations, Colorado demands represent supply-limited conditions instead of full irrigation demands.

Figure C2-7 presents the following by scenario in 2015, 2035, and 2060:

- Agricultural demand for Colorado River water
- Agricultural demand for Colorado River water by planning area
- Agricultural demand as a portion of Colorado River water demand (right hand side of graph)

As can be seen from figure C2-7, agricultural water demand is the largest component of Colorado River demand in Colorado, dropping from about 78 percent in 2015 to between 58 and 71 percent of Colorado River demand in 2060, depending on which scenario is considered. This drop results from both a decrease in agricultural water demand and an increase in other categories of demand.

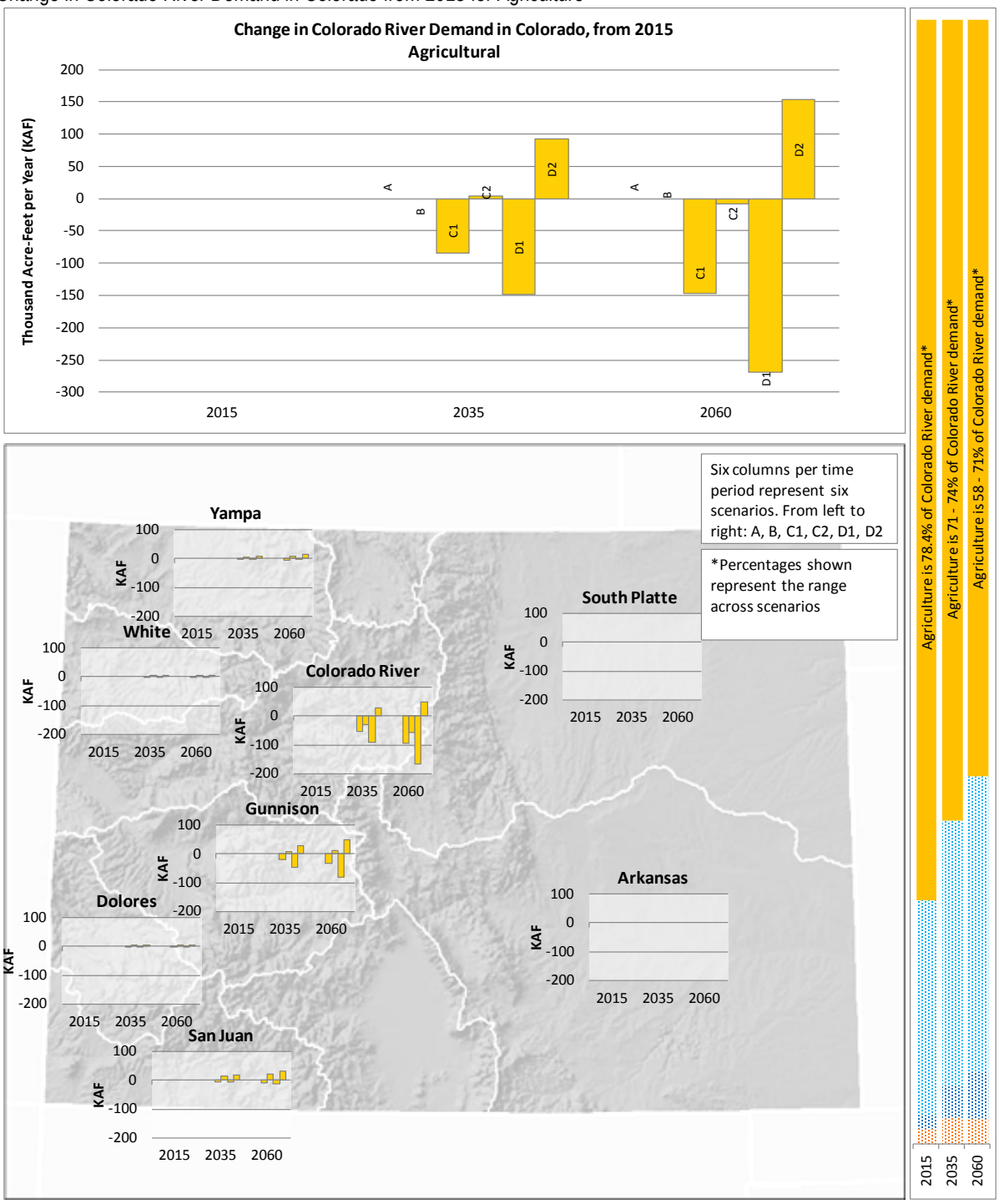
Colorado River demand for agricultural use decreases over time from 2015 to 2060 in the Rapid Growth (C1 and C2) and Enhanced Environment (D1) scenarios and increases in the Enhanced Environment (D2) scenario. The decreases are entirely due to a loss of irrigated acreage. The increase in demand in the Enhanced Environment (D2) scenario because decreases in irrigated acreage are overcome by increases in water delivery per acre due to more intensive agricultural production on these lands.

In examining the planning areas, agricultural demand consistently decreases in the Rapid Growth (C1) and Enhanced Environment (D1) scenarios and increases in the Enhanced Environment (D2) scenario, with variability from planning area to planning area in Rapid Growth (C2) scenario. The largest decrease in demand occurs in the Colorado River planning area.

A strong driver for loss of agricultural acreage is urbanization, leading to physical loss of acreage and market pressure for transfer of water rights. Increases in water delivery per acre are due to better delivery mechanisms or storage, allowing for more use of water on the same acreage in a given growing season.

FIGURE C2-7

Change in Colorado River Demand in Colorado from 2015 for Agriculture



3.3.2 Municipal and Industrial

M&I water demand can be estimated from population and M&I per capita water use, with the addition of self-served industrial (SSI) demand. M&I per capita water use is a measure of the amount of water produced or diverted per person in a given municipality. Because this measure examines all water produced by a given municipality, it often includes industrial, commercial, and institutional demand as well as residential demand. A number of factors may influence the M&I per capita water use of a given community, including the amount of industrial demand, climate, number of institutional facilities, and number of visitors.

SSI users are industries located in a given area that have their own water supply systems and are therefore not directly related to local measures of population and M&I per capita water use.

Figure C2-8 presents the following by scenario in 2015, 2035, and 2060:

- M&I demand for Colorado River water in the Study Area
- M&I demand for Colorado River water in individual planning areas
- M&I demand as a portion of Colorado River water demand (right hand side of graph)

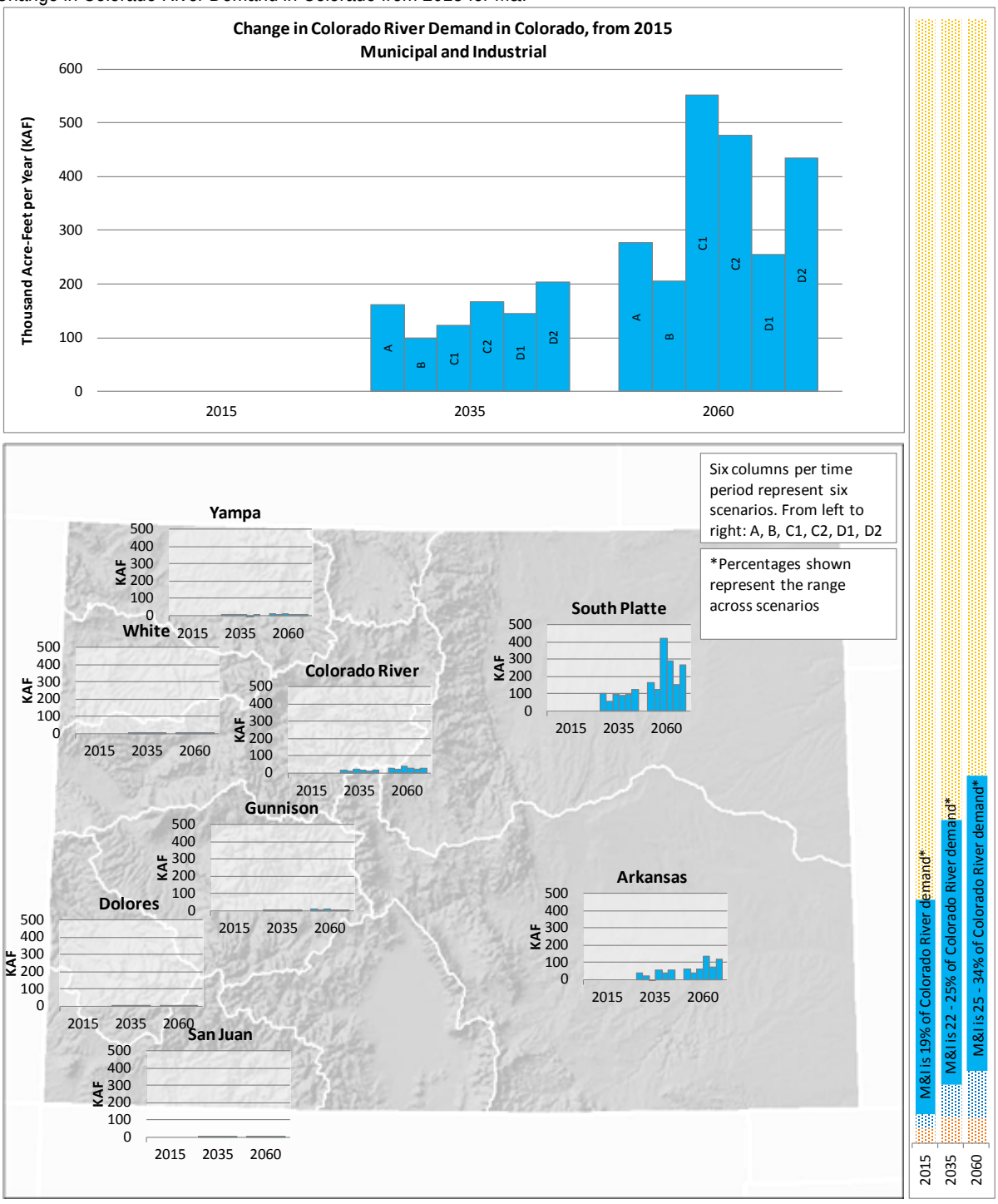
As can be seen from figure C2-8, M&I water demand is the second largest component of Colorado River demand, increasing from about 19 percent in 2015 to between 25 and 34 percent of Colorado River demand in 2060, depending on which scenario is considered.

Colorado River demand for M&I use increases over time from 2015 to 2060 across all scenarios. The increase is primarily due to population increase, as M&I per capita water use decreases over time across all scenarios and SSI demand nominally increases or decreases.

In examining the planning areas, between 60 and 75 percent of the increase in M&I demand for Colorado River water from 2015 to 2060 over time is due to population increase in the South Platte across all scenarios. The remaining increase in demand is primarily from M&I demand in the Arkansas, with some increase in the Colorado River planning area.

Increases in population are somewhat tempered by decreases in M&I per capita water use. Per capita water use decreases in all scenarios, with reductions ranging from 9 to 22 percent by 2060.

FIGURE C2-8
Change in Colorado River Demand in Colorado from 2015 for M&I



3.3.3 Energy

Water demand for energy can be estimated through known plans for new power plants or through applying a per capita energy water use factor. Power facilities often serve areas remote from their locations and therefore potentially represent exports or imports of energy and water from the Study Area to meet these distributed needs.

Figure C2-9 presents the following by scenario in 2015, 2035, and 2060:

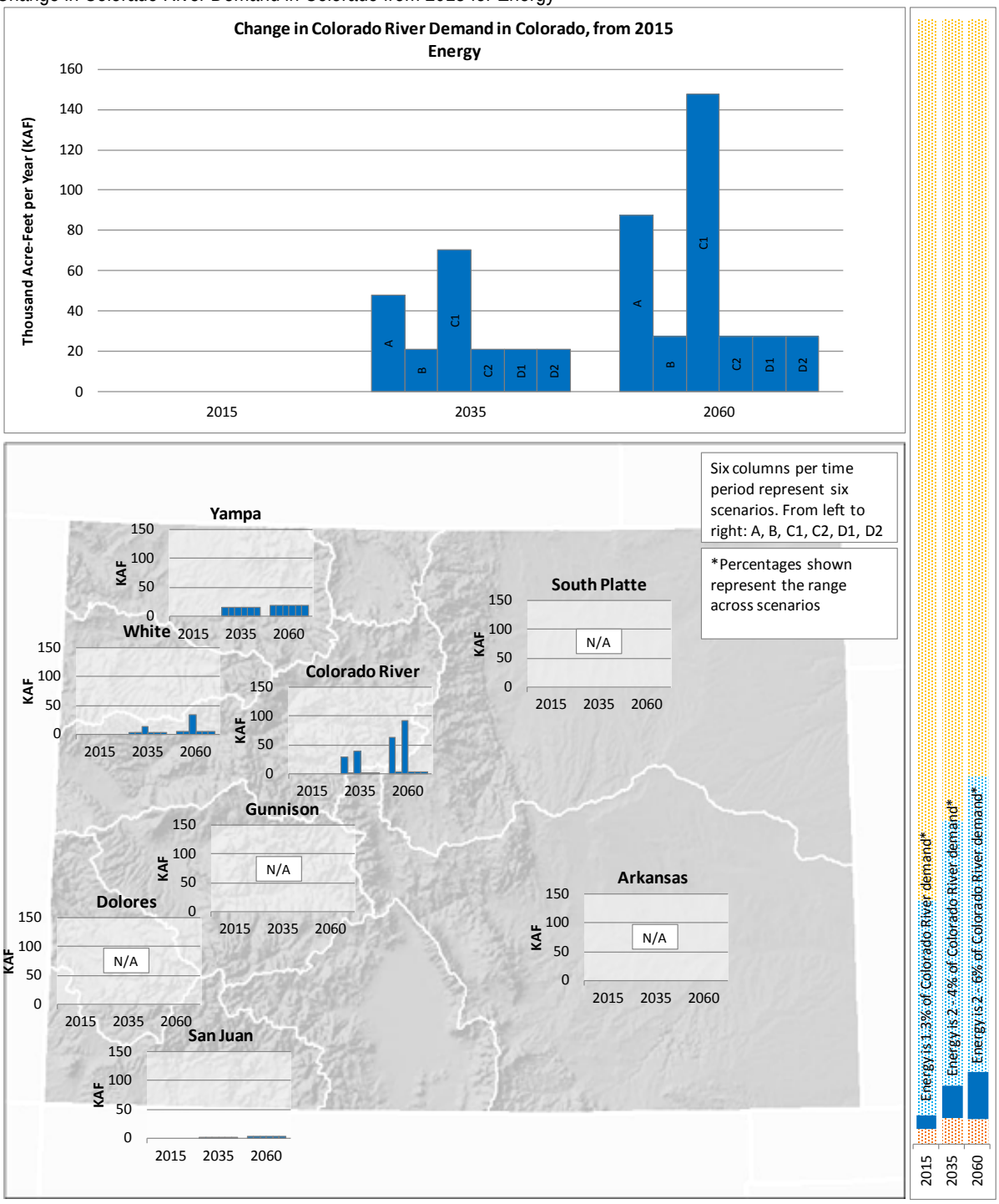
- Energy demand for Colorado River water
- Energy demand for Colorado River water by planning area
- Energy demand as a portion of total Colorado River water demand (right hand side of graph)

As can be seen from figure C2-9, energy water demand is a small fraction of Colorado River demand, increasing from about 1.3 percent of in 2015 to between 2 and 6 percent of Colorado River demand in 2060, depending on which scenario is considered.

Energy demand for Colorado River water increases over time from 2015 to 2060 across all scenarios, with notable increases for the Current Projected (A) and Rapid Growth (C1) scenarios primarily due to oil shale production.

Energy demands are shown in the Yampa, White, San Juan, and Colorado River planning areas. Consistent increases occur in the Yampa planning area across all scenarios. The White planning area shows significant increases in energy demand in the Rapid Growth (C1) scenario, with nominal increases in the remaining scenarios. The San Juan planning area shows a consistent increase in energy demand across the scenarios. The Colorado River planning area shows significant increases in energy demand in the Current Projected (A) and Rapid Growth (C1) scenarios, with nominal increases in the remaining scenarios.

FIGURE C2-9
Change in Colorado River Demand in Colorado from 2015 for Energy



3.3.4 Minerals Extraction

Water demand for mineral production can be estimated through existing uses and known plans for extraction in the Study Area. Water demand for mineral production can vary significantly based on market prices for a given product.

Figure C2-10 presents the following by scenario in 2015, 2035, and 2060:

- Mineral production demand for Colorado River water
- Individual planning area mineral production demand for Colorado River water
- Minerals demand as a portion of Colorado River demand (right hand side of graph)

As can be seen from figure C2-10, minerals water demand is a small fraction of Colorado River demand, increasing from about 1.3 percent in 2015 to about 2 percent of Colorado River demand in 2060, depending on which scenario is considered.

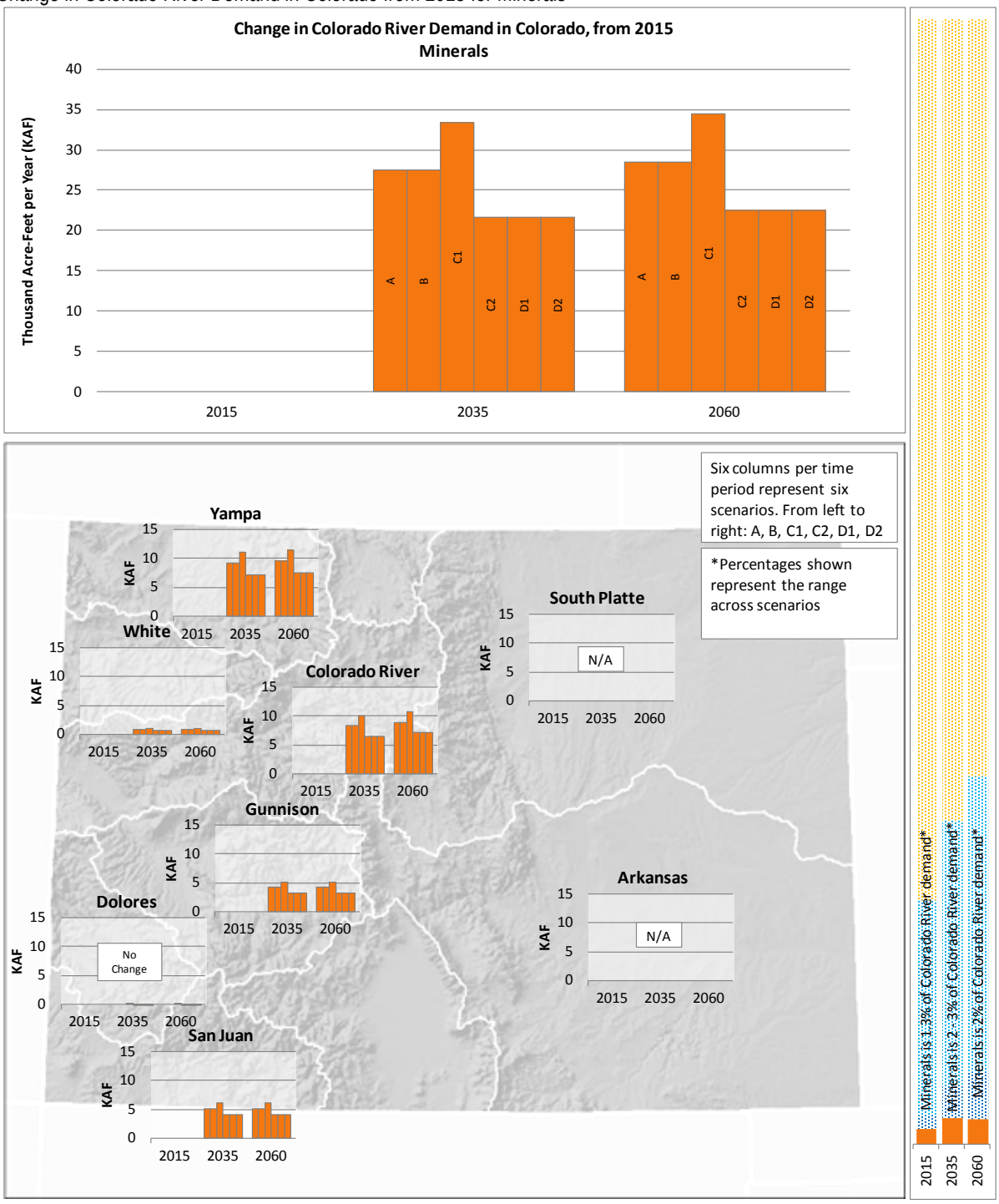
Minerals demand for Colorado River water increases over time from 2015 to 2060 across all scenarios.

Demand for Colorado River water for minerals production is present in all of the planning areas in the hydrologic basin to varying degrees. The Yampa and Colorado River planning areas make up about 33 percent of the increase in demand each, with the Gunnison and San Juan planning areas making up about 16 percent of the increase each. Demand in the Dolores planning area is small and constant.

3.3.5 Fish, Wildlife, and Recreation

There are no consumptive fish, wildlife, and recreation demands on Colorado River water in Colorado.

FIGURE C2-10
Change in Colorado River Demand in Colorado from 2015 for Minerals



3.3.6 Tribal

Tribal demands are represented as components of the other categories previously presented. The tribal reserved water rights are the senior rights in the San Juan basin in Colorado; therefore, in times when full basin demands cannot be met, the first water diverted in the basin is essentially for tribal water right diversions. The category totals in tables C2-2 to C2-5 include Southern Ute Indian Tribe and Ute Mountain Ute Indian Tribe demands.

For additional information on tribal demands, see appendix C9.

3.4 Summary Tables of Parameters and Demands by Category

Tables C2-2 to C2-7 present the specific parameter data collected by planning area. Each table is a complete set of data for a given scenario. These data were used to develop Study Area demands and subsequently Colorado River demands once other supplies were considered. These tables provide the specific information used in the creation of the summary and category plots previously discussed and provide reference information for the data provided.

TABLE C2-2
Total Demand within Study Area under Current Projected (A) Scenario

999 From States
999 Calculated
999 From State Plans
999 From Study Team

Hydrologic Basin		Planning Area / Year	Colorado River 2015	Colorado River 2035	Colorado River 2060	Gunnison 2015	Gunnison 2035	Gunnison 2060	Yampa 2015	Yampa 2035	Yampa 2060	White 2015	White 2035	White 2060	San Juan 2015	San Juan 2035	San Juan 2060	Dolores 2015	Dolores 2035	Dolores 2060	FRONT RANGE South Platte 2015	FRONT RANGE South Platte 2035	FRONT RANGE South Platte 2060	FRONT RANGE Arkansas 2015	FRONT RANGE Arkansas 2035	FRONT RANGE Arkansas 2060	STATE TOTAL 2015	STATE TOTAL 2035	STATE TOTAL 2060	Source and comments
Agricultural	Irrigated Acreage	acres	270,350	270,350	270,350	268,950	268,950	268,950	92,800	92,800	92,800	26,900	26,900	26,900	219,650	219,650	219,650	39,800	39,800	39,800							918,450	918,450	918,450	1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	6.85	6.85	6.89	6.89	6.89	4.44	4.44	4.44	10.25	10.25	10.25	3.52	3.52	3.52	3.70	3.70	3.70							5.79	5.79	5.79	2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%	3)
	Demand (Consumptive)	af/yr	**484,600**	**484,600**	**484,600**	**490,000**	**490,000**	**490,000**	**140,000**	**140,000**	**140,000**	**41,000**	**41,000**	**41,000**	**329,500**	**329,500**	**329,500**	**54,200**	**54,200**	**54,200**							**1,539,300**	**1,539,300**	**1,539,300**	
Municipal and Industrial	Population		356,500	558,000	836,000	120,833	184,000	244,000	42,000	65,000	113,000	10,167	16,000	28,000	84,667	129,500	175,000	36,333	55,500	75,000							650,500	1,008,000	1,471,000	5)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	173	164	173	166	157	228	219	208	228	219	208	182	174	165	182	174	165							183	176	167	6)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%	7)
	Municipal and Industrial Demand (Consumptive)	af/yr	25,228	37,846	53,752	8,180	11,975	15,019	3,757	5,581	9,215	909	1,374	2,283	6,025	8,834	11,320	2,585	3,786	4,852							46,684	69,396	96,441	
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	4,740	4,740	325	650	650	7,003	10,070	10,070	0	0	0	410	410	410	0	0	0							11,178	15,870	15,870	8)
	Demand (Consumptive)	af/yr	28,668	42,586	58,492	8,505	12,625	15,669	10,760	15,651	19,285	909	1,374	2,283	6,435	9,244	11,730	2,585	3,786	4,852							**57,862**	**85,266**	**112,311**	
Energy	**Demand (Consumptive)**	af/yr	2,000	29,870	64,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0							**30,117**	**78,070**	**117,600**	9)
Minerals	**Demand (Consumptive)**	af/yr	9,667	18,000	18,600	4,833	9,000	9,000	10,333	19,500	19,800	950	1,700	1,800	4,717	9,800	9,800	1,000	1,000	1,000							**31,500**	**59,000**	**60,000**	10)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							**0**	**0**	**0**	
Tribal	**Demand (Consumptive)**	af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							**0**	**0**	**0**	11)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**524,934**	**575,056**	**626,392**	**503,338**	**511,625**	**514,669**	**185,727**	**215,451**	**221,285**	**44,109**	**48,074**	**50,883**	**342,885**	**352,444**	**355,930**	**57,785**	**58,986**	**60,052**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,779**	**1,761,636**	**1,829,211**	
Adjacent Areas																														
Agricultural	Irrigated Acreage	acres																			827,500	810,000	789,000	427,833	427,000	426,000	1,255,333	1,237,000	1,215,000	12)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.50	3.50	3.97	3.97	3.97	3.66	3.66	3.66	2)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%	3)
	Demand (Diversion)	af/yr																			**2,892,765**	**2,831,588**	**2,758,177**	**1,700,338**	**1,697,026**	**1,693,051**	**4,593,102**	**4,528,614**	**4,451,228**	4), 20)
	Demand (Consumptive)	af/yr																			**1,112,295**	**1,088,773**	**1,060,545**	**543,348**	**542,290**	**541,020**	**1,655,644**	**1,631,063**	**1,601,565**	
Municipal and Industrial	Population																				3,944,750	5,244,000	6,580,700	1,079,250	1,451,000	1,846,000	5,024,000	6,695,000	8,426,700	13)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	164	154	184	176	167	173	167	157	6)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%	7)
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	963,345	1,135,188	221,837	286,059	345,321	973,016	1,249,403	1,480,510	8)
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	59,000	59,000	49,400	49,400	49,400	108,400	108,400	108,400	14)
	Demand (Diversion)	af/yr																			**810,179**	**1,022,345**	**1,194,188**	**271,237**	**335,459**	**394,721**	**1,081,416**	**1,357,803**	**1,588,910**	
	Demand (Consumptive)	af/yr																			**321,913**	**396,171**	**456,316**	**127,043**	**149,521**	**170,262**	**448,956**	**545,691**	**626,578**	
Energy	**Demand (Diversion)**	af/yr																			**35,733**	**47,400**	**59,400**	**9,950**	**14,700**	**18,400**	**45,683**	**62,100**	**77,800**	15)
Minerals	**Demand (Diversion)**	af/yr																			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	16)
Tribal	**Demand (Diversion)**	af/yr																			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	16)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,901,333**	**4,011,765**	**1,981,524**	**2,047,184**	**2,106,173**	**5,720,202**	**5,948,517**	**6,117,938**	17)
Total Demand in the Study Area		af/yr	**524,934**	**575,056**	**626,392**	**503,338**	**511,625**	**514,669**	**185,727**	**215,451**	**221,285**	**44,109**	**48,074**	**50,883**	**342,885**	**352,444**	**355,930**	**57,785**	**58,986**	**60,052**	**3,738,677**	**3,901,333**	**4,011,765**	**1,981,524**	**2,047,184**	**2,106,173**	**7,378,981**	**7,710,153**	**7,947,149**	18)
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	3,268,433	3,314,565	1,783,841	1,813,084	1,848,373	4,988,202	5,081,517	5,162,938	
Potential Colorado River Demand		af/yr	**524,934**	**575,056**	**626,392**	**503,338**	**511,625**	**514,669**	**185,727**	**215,451**	**221,285**	**44,109**	**48,074**	**50,883**	**342,885**	**352,444**	**355,930**	**57,785**	**58,986**	**60,052**	**534,317**	**632,900**	**697,200**	**197,683**	**234,100**	**257,800**	**2,390,779**	**2,628,636**	**2,784,211**	19), 21)
Agricultural	Colorado River Demand	af/yr	484,600	484,600	484,600	490,000	490,000	490,000	140,000	140,000	140,000	41,000	41,000	41,000	329,500	329,500	329,500	54,200	54,200	54,200	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,874,571	1,874,571	22)
Municipal and Industrial	Colorado River Demand	af/yr	28,668	42,586	58,492	8,505	12,625	15,669	10,760	15,651	19,285	909	1,374	2,283	6,435	9,244	11,730	2,585	3,786	4,852	347,306	445,889	510,189	49,420	85,840	109,540	454,588	616,995	732,040	
Energy	Colorado River Demand	af/yr	2,000	29,870	64,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	78,070	117,600	
Minerals	Colorado River Demand	af/yr	9,667	18,000	18,600	4,833	9,000	9,000	10,333	19,500	19,800	950	1,700	1,800	4,717	9,800	9,800	1,000	1,000	1,000	0	0	0	0	0	0	31,500	59,000	60,000	
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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	
Tribal	Colorado River Demand	af/yr	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	0	0	-3	0	0	-3	0	0	

Comments and Sources

1) Based on CDSS estimates, also used in SWSI. Irrigated acreage in the Colorado River basin estimated to remain constant. (SWSI Table 4-10)
2) Calculated from SWSI as headgate diversion to irrigation divided by acreage. See supporting table below.
3) System efficiency = supply-limited consumptive use divided by headgate diversions. See supporting table below.
4) Diversions in the South Platte and Arkansas include both surface water and alluvial ground water sources.
5) Population for 2015 interpolated between SWSI 2008 and SWSI 2035 estimates. Population for 2035 from SWSI. Population for 2060 extrapolated based SWSI increases between 2035 and 2050 medium estimates. (SWSI Table 4-1)
6) Per capita water withdrawal demands based on SWSI 2010 estimates, reduced by 10 percent in 2060 based on description in current trend analysis. (Table 4.3)
7) Consumptive use efficiency factor from CWCB CU & Losses Report.
8) Industrial based on SWSI Table 4-8. Includes "Large Industry" and "Snowmaking" categories. Assumed to be 100 percent consumptive.
9) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. An additional 60,000 af is estimated to occur in the Colorado River basin based on the CWCB 2050 M&I Water User Projections July 2010 Report, Appendix F Medium projection. Assumed to be 100 percent consumptive.
10) Mineral uses were not included in SWSI. Uses are from the UCRS Schedule.
11) Tribal demands are included in the San Juan basin demands under the specific demand category. Their demands are estimated using the same parameters for Ag and M&I.
12) Per the Current Trend Storyline, Agricultural use in the Arkansas and South Platte basins stay relatively constant. 2060 numbers reflect reduction based on Table 4-11 low "decrease in acreage due to Urbanization". 2035 represents 1/2 of the low decrease in acreage due to urbanization value.
13) See 5). Population estimates for the entire Arkansas Basin; and the South Platte and Metro estimates combined from SWSI. Note that the entire South Platte and Arkansas basin cannot receive Colorado River basin water.
14) Industry demands based on SWSI Large Industry demands. Note that this is appropriate because there is no mining included in the South Platte and Arkansas estimates. 2008 estimates are used for 2011. There is no change shown between 2035 and 2050, therefore 2050 estimates are used for 2060. (SWSI Table 4-4). Assumed 100 percent consumptive.
15) Energy demands for the Arkansas and the South Platte represent SWSI Thermoelectric Power demands. 2008 values were used for 2011, 2050 medium level was used to estimate 2060. (SWSI Table 4-6)
16) Based on SWSI estimates - no mineral, fish and wildlife, or Tribal use in the Arkansas and South Platte.
17) Note that Arkansas and South Platte estimates do not include losses due to Reservoir Evaporation, estimated to be as high a as 500,000 af.
18) Calculated from the sum of Hydrologic Basin (Consumptive) Demand and Adjacent Areas (Diversion) Demand.
19) Current transbasin diversions based on recent averages and SWSI estimates split between basins based on average annual diversion over the 2000 to 2010 period. Future exports consider reuse of transbasin water. Note that essentially 100 percent of current transbasin water is reused within the service area - not necessarily by the original user (i.e. return flows from municipal exports may be reused by agricultural users.)
20) Agricultural transfers reduce the diversion demand only by the consumptive use portion - under Colorado Water Law, the return flows must be left in the river for the downstream diverters who have historically re-diverted them.
21) As new Colorado River water is brought to the front range for municipal use, it will move towards 100 percent consumptive by the importing entity (100 percent reuse).
22) Colorado River demand in adjacent areas is distributed amongst categories according to current estimated distribution of transbasin diversions.

TABLE C2-3
Total Demand within Study Area under Slow Growth (B) Scenario

From Current Projected Data Sheet
Input Parameter
Computed

			COLORADO																															
	Planning Area		Colorado River			Gunnison			Yampa			White			San Juan			Dolores			South Platte			Arkansas			STATE TOTAL			Source and
Hydrologic Basin		Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	comments
Agricultural	Irrigated Acreage	acres	270,350	270,350	270,350	268,950	268,950	268,950	92,800	92,800	92,800	26,900	26,900	26,900	219,650	219,650	219,650	39,800	39,800	39,800							918,450	918,450	918,450	1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	6.85	6.85	6.89	6.89	6.89	4.44	4.44	4.44	10.25	10.25	10.25	3.52	3.52	3.52	3.70	3.70	3.70							5.79	5.79	5.79	2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%	
	Demand (Consumptive)	af/yr	**484,600**	**484,600**	**484,600**	**490,000**	**490,000**	**490,000**	**140,000**	**140,000**	**140,000**	**41,000**	**41,000**	**41,000**	**329,500**	**329,500**	**329,500**	**54,200**	**54,200**	**54,200**							**1,539,300**	**1,539,300**	**1,539,300**	
Municipal and Industrial	Population		356,500	530,500	748,000	120,800	169,490	230,340	42,000	61,430	85,710	10,200	14,660	20,230	84,700	117,900	159,400	36,300	50,530	68,310							650,500	944,510	1,311,990	3)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	173	164	173	166	157	228	219	208	228	219	208	182	174	165	182	174	165							183	176	166	4)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%	
	Municipal and Industrial Demand (Consumptive)	af/yr	25,298	35,981	48,094	8,193	11,031	14,178	3,754	5,274	6,989	912	1,259	1,650	6,044	8,043	10,311	2,590	3,447	4,419							46,791	65,034	85,641	
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	4,740	4,740	325	650	650	7,003	10,070	10,070	0	0	0	410	410	410	0	0	0							11,178	15,870	15,870	5)
	Demand (Consumptive)	af/yr	**28,738**	**40,721**	**52,834**	**8,518**	**11,681**	**14,828**	**10,758**	**15,344**	**17,059**	**912**	**1,259**	**1,650**	**6,454**	**8,453**	**10,721**	**2,590**	**3,447**	**4,419**							**57,969**	**80,904**	**101,511**	
Energy	**Demand (Consumptive)**	af/yr	**2,000**	**3,200**	**4,700**	**0**	**0**	**0**	**24,633**	**40,300**	**42,200**	**1,250**	**4,000**	**5,800**	**2,233**	**3,900**	**4,900**	**0**	**0**	**0**							**30,117**	**51,400**	**57,600**	6)
Minerals	**Demand (Consumptive)**	af/yr	**9,667**	**18,000**	**18,600**	**4,833**	**9,000**	**9,000**	**10,333**	**19,500**	**19,800**	**950**	**1,700**	**1,800**	**4,717**	**9,800**	**9,800**	**1,000**	**1,000**	**1,000**							**31,500**	**59,000**	**60,000**	7)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	8)
Tribal	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	9)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**525,004**	**546,521**	**560,734**	**503,352**	**510,681**	**513,828**	**185,724**	**215,144**	**219,059**	**44,112**	**47,959**	**50,250**	**342,904**	**351,653**	**354,921**	**57,790**	**58,647**	**59,619**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,886**	**1,730,604**	**1,758,411**	
Adjacent Areas																																		
Agricultural	Irrigated Acreage	acres																			827,500	810,000	789,000	427,833	427,000	426,000	1,255,333	1,237,000	1,215,000	10)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.50	3.50	3.97	3.97	3.97	3.66	3.66	3.66	11)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%	
	Demand (Diversion)	af/yr																			**2,892,765**	**2,831,588**	**2,758,177**	**1,700,338**	**1,697,026**	**1,693,051**	**4,593,102**	**4,528,614**	**4,451,228**	
	Demand (Consumptive)	af/yr																			**1,112,295**	**1,088,773**	**1,060,545**	**543,348**	**542,290**	**541,020**	**1,655,644**	**1,631,063**	**1,601,565**	
Municipal and Industrial	Population																				3,944,750	5,019,750	6,363,500	1,079,250	1,365,960	1,724,360	5,024,000	6,385,710	8,087,860	12)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	164	154	184	176	167	173	167	157	13)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%	
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	922,149	1,097,721	222,441	269,293	322,567	973,620	1,191,442	1,420,288	
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	59,000	59,000	49,400	49,400	49,400	108,400	108,400	108,400	14)
	Demand (Diversion)	af/yr																			**810,179**	**981,149**	**1,156,721**	**271,841**	**318,693**	**371,967**	**1,082,020**	**1,299,842**	**1,528,688**	
	Demand (Consumptive)	af/yr																			**283,563**	**343,402**	**404,852**	**95,144**	**111,543**	**130,188**	**378,707**	**454,945**	**535,041**	
Energy	**Demand (Diversion)**	af/yr																			35,733	47,400	59,400	9,950	14,700	18,400	**45,683**	**62,100**	**77,800**	15)
Minerals	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	17)
Tribal	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	18)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,860,137**	**3,974,298**	**1,982,129**	**2,030,419**	**2,083,418**	**5,720,806**	**5,890,557**	**6,057,716**	
Total Demand in the Study Area		af/yr	**525,004**	**546,521**	**560,734**	**503,352**	**510,681**	**513,828**	**185,724**	**215,144**	**219,059**	**44,112**	**47,959**	**50,250**	**342,904**	**351,653**	**354,921**	**57,790**	**58,647**	**59,619**	**3,738,677**	**3,860,137**	**3,974,298**	**1,982,129**	**2,030,419**	**2,083,418**	**7,379,692**	**7,621,161**	**7,816,127**	
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	3,268,433	3,314,565	1,783,841	1,813,084	1,848,373	4,988,202	5,081,517	5,162,938	19)
Potential Colorado River Demand		af/yr	**525,004**	**546,521**	**560,734**	**503,352**	**510,681**	**513,828**	**185,724**	**215,144**	**219,059**	**44,112**	**47,959**	**50,250**	**342,904**	**351,653**	**354,921**	**57,790**	**58,647**	**59,619**	**534,317**	**591,704**	**659,732**	**198,288**	**217,335**	**235,045**	**2,391,490**	**2,539,643**	**2,653,189**	20)
Agricultural	Colorado River Demand	af/yr	484,600	484,600	484,600	490,000	490,000	490,000	140,000	140,000	140,000	41,000	41,000	41,000	329,500	329,500	329,500	54,200	54,200	54,200	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,874,571	1,874,571	21)
Municipal and Industrial	Colorado River Demand	af/yr	28,738	40,721	52,834	8,518	11,681	14,828	10,758	15,344	17,059	912	1,259	1,650	6,454	8,453	10,721	2,590	3,447	4,419	347,306	404,693	472,721	50,028	69,075	86,785	455,303	554,672	661,018	
Energy	Colorado River Demand	af/yr	2,000	3,200	4,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	51,400	57,600	
Minerals	Colorado River Demand	af/yr	9,667	18,000	18,600	4,833	9,000	9,000	10,333	19,500	19,800	950	1,700	1,800	4,717	9,800	9,800	1,000	1,000	1,000	0	0	0	0	0	0	31,500	59,000	60,000	
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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	
Tribal	Colorado River Demand	af/yr	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	

Source and Comments

1) No changes from current projected
2) No changes from current projected
3) Used low population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 low estimates.
4) No changes from current projected
5) No changes from current projected
6) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. Assumed to be 100 percent consumptive.
7) No changes from current projected
8) No changes from current projected
9) No changes from current projected
10) No changes from current projected
11) No changes from current projected
12) Used low population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 low estimates.
13) No changes from current projected
14) No changes from current projected
15) No changes from current projected
16) No changes from current projected
17) No changes from current projected
18) No changes from current projected
19) Set to Current Trend estimates based on same trends to increase use of existing projects and non-tributary ground water.
20) Total Adjacent Area demand less Demand that may be met by Other Supplies.
21) Agricultural Use is estimated to be same as current projected for Adjacent Areas. Remaining Adjacent Area use is estimated to be Municipal and Industrial.

TABLE C2-4
Total Demand within Study Area under Rapid Growth (C1) Scenario

From Current Projected Data Sheet
Input Parameter
Computed

Hydrologic Basin			COLORADO																													Source and comments
	Planning Area		Colorado River			Gunnison			Yampa			White			San Juan			Dolores			South Platte			Arkansas			STATE TOTAL					
	Year		2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060			
Agricultural	Irrigated Acreage	acres	270,350	239,750	216,800	268,950	258,700	251,000	92,800	90,700	89,150	26,900	26,300	25,850	219,650	216,050	213,350	39,800	39,150	38,650							918,450	870,650	834,800			1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	6.85	6.85	6.89	6.89	6.89	4.44	4.44	4.44	10.25	10.25	10.25	3.52	3.52	3.52	3.70	3.70	3.70							5.79	5.75	5.71			2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%			
	Demand (Consumptive)	af/yr	**484,600**	**429,750**	**388,612**	**490,000**	**471,326**	**457,297**	**140,000**	**136,832**	**134,494**	**41,000**	**40,086**	**39,400**	**329,500**	**324,100**	**320,049**	**54,200**	**53,315**	**52,634**							**1,539,300**	**1,455,407**	**1,392,485**			
Municipal and Industrial	Population		356,500	628,210	967,860	120,800	188,910	274,060	42,000	88,340	146,280	10,200	21,460	35,520	84,700	135,900	199,900	36,300	58,240	85,670							650,500	1,121,060	1,709,290			3)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	173	164	173	166	157	228	219	208	228	219	208	182	174	165	182	174	165							183	176	168			4)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%			
	Municipal and Industrial Demand (Consumptive)	af/yr	25,298	42,608	62,230	8,193	12,294	16,869	3,754	7,585	11,929	912	1,843	2,897	6,044	9,271	12,931	2,590	3,973	5,542							46,791	77,574	112,397			
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	4,740	4,740	325	650	650	7,003	10,070	10,070	0	0	0	410	410	410	0	0	0							11,178	15,870	15,870			5)
	Demand (Consumptive)	af/yr	**28,738**	**47,348**	**66,970**	**8,518**	**12,944**	**17,519**	**10,758**	**17,655**	**21,999**	**912**	**1,843**	**2,897**	**6,454**	**9,681**	**13,341**	**2,590**	**3,973**	**5,542**							**57,969**	**93,444**	**128,267**			
Energy	**Demand (Consumptive)**	af/yr	**2,000**	**41,200**	**94,700**	**0**	**0**	**0**	**24,633**	**40,300**	**42,200**	**1,250**	**15,356**	**35,800**	**2,233**	**3,900**	**4,900**	**0**	**0**	**0**							**30,117**	**100,756**	**177,600**			6)
Minerals	**Demand (Consumptive)**	af/yr	**9,667**	**19,800**	**20,460**	**4,833**	**9,900**	**9,900**	**10,333**	**21,450**	**21,780**	**950**	**1,870**	**1,980**	**4,717**	**10,780**	**10,780**	**1,000**	**1,100**	**1,100**							**31,500**	**64,900**	**66,000**			7)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**			8)
Tribal	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**			9)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**525,004**	**538,098**	**570,742**	**503,352**	**494,170**	**484,716**	**185,724**	**216,237**	**220,472**	**44,112**	**59,154**	**80,076**	**342,904**	**348,460**	**349,071**	**57,790**	**58,388**	**59,276**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,886**	**1,714,506**	**1,764,353**			
			2,000	**29,870**	**64,700**																											
Adjacent Areas																																
Agricultural	Irrigated Acreage	acres																			827,500	676,900	564,000	427,833	386,200	355,000	1,255,333	1,063,100	919,000			10)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.50	3.50	3.97	3.97	3.97	3.66	3.67	3.68			11)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%			
	Demand (Diversion)	af/yr																			**2,892,765**	**2,366,299**	**1,971,625**	**1,700,338**	**1,534,874**	**1,410,876**	**4,593,102**	**3,901,173**	**3,382,501**			
	Demand (Consumptive)	af/yr																			**1,112,295**	**909,864**	**758,108**	**543,348**	**490,474**	**450,850**	**1,655,644**	**1,400,338**	**1,208,958**			
Municipal and Industrial	Population																				3,944,750	5,461,460	7,357,360	1,079,250	1,514,540	2,058,640	5,024,000	6,976,000	9,416,000			12)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	164	154	184	176	167	173	167	157			13)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%			
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	1,003,293	1,269,164	222,441	298,585	385,099	973,620	1,301,878	1,654,263			
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	59,000	59,000	49,400	49,400	49,400	108,400	108,400	108,400			14)
	Demand (Diversion)	af/yr																			**810,179**	**1,062,293**	**1,328,164**	**271,841**	**347,985**	**434,499**	**1,082,020**	**1,410,278**	**1,762,663**			
	Demand (Consumptive)	af/yr																			**283,563**	**371,803**	**464,858**	**95,144**	**121,795**	**152,075**	**378,707**	**493,597**	**616,932**			
Energy	**Demand (Diversion)**	af/yr																			35,733	47,400	59,400	9,950	14,700	18,400	**45,683**	**62,100**	**77,800**			15)
Minerals	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**			16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**			17)
Tribal	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**			18)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,475,992**	**3,359,189**	**1,982,129**	**1,897,560**	**1,863,775**	**5,720,806**	**5,373,552**	**5,222,964**			
Total Demand in the Study Area		af/yr	**525,004**	**538,098**	**570,742**	**503,352**	**494,170**	**484,716**	**185,724**	**216,237**	**220,472**	**44,112**	**59,154**	**80,076**	**342,904**	**348,460**	**349,071**	**57,790**	**58,388**	**59,276**	**3,738,677**	**3,475,992**	**3,359,189**	**1,982,129**	**1,897,560**	**1,863,775**	**7,379,692**	**7,088,058**	**6,987,316**			
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	2,848,321	2,403,270	1,783,841	1,704,559	1,605,457	4,988,202	4,552,880	4,008,727			19)
Potential Colorado River Demand		af/yr	**525,004**	**538,098**	**570,742**	**503,352**	**494,170**	**484,716**	**185,724**	**216,237**	**220,472**	**44,112**	**59,154**	**80,076**	**342,904**	**348,460**	**349,071**	**57,790**	**58,388**	**59,276**	534,317	627,671	955,918	198,288	193,001	258,318	**2,391,490**	**2,535,178**	**2,978,589**			20)
Agricultural	Colorado River Demand	af/yr	484,600	429,750	388,612	490,000	471,326	457,297	140,000	136,832	134,494	41,000	40,086	39,400	329,500	324,100	320,049	54,200	53,315	52,634	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,790,678	1,727,756			21)
Municipal and Industrial	Colorado River Demand	af/yr	28,738	47,348	66,970	8,518	12,944	17,519	10,758	17,655	21,999	912	1,843	2,897	6,454	9,681	13,341	2,590	3,973	5,542	347,306	440,660	768,907	50,028	44,741	110,058	455,303	578,845	1,007,233			
Energy	Colorado River Demand	af/yr	2,000	41,200	94,700	0	0	0	24,633	40,300	42,200	1,250	15,356	35,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	100,756	177,600			
Minerals	Colorado River Demand	af/yr	9,667	19,800	20,460	4,833	9,900	9,900	10,333	21,450	21,780	950	1,870	1,980	4,717	10,780	10,780	1,000	1,100	1,100	0	0	0	0	0	0	31,500	64,900	66,000			
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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			
Tribal	Colorado River Demand	af/yr	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			

Source and Comments

1) Used estimated 2050 High irrigated acreage from SWSI Table 4-11 for 2060, linearly interpolated to estimate 2035.
2) No changes from current projected
3) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
4) No changes from current projected
5) No changes from current projected
6) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. An additional 120,000 af is estimated to occur in the Colorado River basin (30,000) and the White River Basin (30,000) based on the CWCB 2050 M&I Water User Projections July 2010 Report, Appendix F Table 13 High projection. Assumed to be 100 percent consumptive.
7) Mineral use not included in SWSI, assume 10% decrease from current projected in 2035 and in 2060 .
8) No changes from current projected
9) No changes from current projected
10) Used estimated 2050 Low irrigated acreage from SWSI Table 4-11 for 2060, linearly interpolated to estimate 2035.
11) No changes from current projected
12) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
13) No changes from current projected
14) No changes from current projected
15) No changes from current projected
16) No changes from current projected
17) No changes from current projected
18) No changes from current projected
19) Demand that may be met from Other Supplies decreases based on full development of current water rights, expanded reuse of both transbasin and in-basin sources, and decreases yield from agricultural transfers estimated to decrease 25% from current levels by 2060 in the South Platte; and 10% from current levels in the Arkansas.
20) Total Adjacent Area demand less Demand that may be met by Other Supplies.
21) Agricultural Use is estimated to be same as current projected for Adjacent Areas. Remaining Adjacent Area use is estimated to be Municipal and Industrial.

TABLE C2-5
Total Demand within Study Area under Rapid Growth (C2) Scenario

From Current Projected Data Sheet
Input Parameter
Computed

			COLORADO																													
	Planning Area		Colorado River			Gunnison			Yampa			White			San Juan			Dolores			South Platte			Arkansas			STATE TOTAL			Source and
Hydrologic Basin		Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	comments
Agricultural	Irrigated Acreage	acres	270,350	239,750	216,800	268,950	258,700	251,000	92,800	90,700	89,150	26,900	26,300	25,850	219,650	216,050	213,350	39,800	39,150	38,650							918,450	870,650	834,800	1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	7.26	7.53	6.89	7.31	7.58	4.44	4.71	4.89	10.25	10.86	11.27	3.52	3.73	3.87	3.70	3.92	4.07							5.79	6.09	6.28	2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%	
	Demand (Consumptive)	af/yr	**484,600**	**455,535**	**427,473**	**490,000**	**499,605**	**503,027**	**140,000**	**145,042**	**147,943**	**41,000**	**42,491**	**43,340**	**329,500**	**343,546**	**352,054**	**54,200**	**56,514**	**57,897**							**1,539,300**	**1,542,732**	**1,531,734**	
Municipal and Industrial	Population		356,500	628,210	967,860	120,800	188,910	274,060	42,000	88,340	146,280	10,200	21,460	35,520	84,700	135,900	199,900	36,300	58,240	85,670							650,500	1,121,060	1,709,290	3)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	165	145	173	158	138	228	208	182	228	208	182	182	166	146	182	166	146							183	168	148	4)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%	
	Municipal and Industrial Demand (Consumptive)	af/yr	25,298	40,638	55,020	8,193	11,702	14,827	3,754	7,204	10,438	912	1,750	2,534	6,044	8,844	11,442	2,590	3,790	4,904							46,791	73,928	99,166	
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	2,236	2,236	325	211	211	7,003	4,552	4,552	0	0	0	410	267	267	0	0	0							11,178	7,266	7,266	5)
	Demand (Consumptive)	af/yr	**28,738**	**42,874**	**57,256**	**8,518**	**11,913**	**15,039**	**10,757**	**11,756**	**14,990**	**912**	**1,750**	**2,534**	**6,454**	**9,111**	**11,709**	**2,590**	**3,790**	**4,904**							**57,969**	**81,194**	**106,432**	
Energy	**Demand (Consumptive)**	af/yr	**2,000**	**3,200**	**4,700**	**0**	**0**	**0**	**24,633**	**40,300**	**42,200**	**1,250**	**4,000**	**5,800**	**2,233**	**3,900**	**4,900**	**0**	**0**	**0**							**30,117**	**51,400**	**57,600**	6)
Minerals	**Demand (Consumptive)**	af/yr	**9,667**	**16,200**	**16,740**	**4,833**	**8,100**	**8,100**	**10,333**	**17,550**	**17,820**	**950**	**1,530**	**1,620**	**4,717**	**8,820**	**8,820**	**1,000**	**900**	**900**							**31,500**	**53,100**	**54,000**	7)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	8)
Tribal	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	9)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**525,004**	**517,809**	**506,170**	**503,352**	**519,618**	**526,165**	**185,724**	**214,648**	**222,952**	**44,112**	**49,771**	**53,294**	**342,904**	**365,377**	**377,483**	**57,790**	**61,204**	**63,701**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,885**	**1,728,426**	**1,749,765**	
Adjacent Areas																																
Agricultural	Irrigated Acreage	acres																			827,500	676,900	564,000	427,833	386,200	355,000	1,255,333	1,063,100	919,000	10)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.71	3.85	3.97	4.21	4.37	3.66	3.89	4.05	11)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%	
	Demand (Diversion)	af/yr																			**2,892,765**	**2,508,277**	**2,168,787**	**1,700,338**	**1,626,967**	**1,551,964**	**4,593,102**	**4,135,244**	**3,720,751**	
	Demand (Consumptive)	af/yr																			**1,112,295**	**964,456**	**833,919**	**543,348**	**519,902**	**495,935**	**1,655,644**	**1,484,359**	**1,329,854**	
Municipal and Industrial	Population																				3,944,750	5,461,460	7,357,360	1,079,250	1,514,540	2,058,640	5,024,000	6,976,000	9,416,000	12)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	155	136	184	168	147	173	158	138	13)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%	
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	948,234	1,120,820	222,441	285,013	338,979	973,620	1,233,247	1,459,800	
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	38,350	38,350	49,400	32,110	32,110	108,400	70,460	70,460	14)
	Demand (Diversion)	af/yr																			**810,179**	**986,584**	**1,159,170**	**271,841**	**317,123**	**371,089**	**1,082,020**	**1,303,707**	**1,530,260**	
	Demand (Consumptive)	af/yr																			**283,563**	**345,304**	**405,710**	**95,144**	**110,993**	**129,881**	**378,707**	**456,298**	**535,591**	
Energy	**Demand (Diversion)**	af/yr																			35,733	47,400	59,400	9,950	14,700	18,400	**45,683**	**62,100**	**77,800**	15)
Minerals	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	17)
Tribal	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	18)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,542,261**	**3,387,357**	**1,982,129**	**1,958,790**	**1,941,453**	**5,720,806**	**5,501,051**	**5,328,810**	
Total Demand in the Study Area		af/yr	**525,004**	**517,809**	**506,170**	**503,352**	**519,618**	**526,165**	**185,724**	**214,648**	**222,952**	**44,112**	**49,771**	**53,294**	**342,904**	**365,377**	**377,483**	**57,790**	**61,204**	**63,701**	**3,738,677**	**3,542,261**	**3,387,357**	**1,982,129**	**1,958,790**	**1,941,453**	**7,379,691**	**7,229,477**	**7,078,576**	
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	2,919,529	2,563,488	1,783,841	1,704,559	1,605,457	4,988,202	4,624,088	4,168,945	19)
Potential Colorado River Demand		af/yr	**525,004**	**517,809**	**506,170**	**503,352**	**519,618**	**526,165**	**185,724**	**214,648**	**222,952**	**44,112**	**49,771**	**53,294**	**342,904**	**365,377**	**377,483**	**57,790**	**61,204**	**63,701**	534,317	622,733	823,869	198,288	254,231	335,996	**2,391,490**	**2,605,389**	**2,909,630**	20)
Agricultural	Colorado River Demand	af/yr	484,600	455,535	427,473	490,000	499,605	503,027	140,000	145,042	147,943	41,000	42,491	43,340	329,500	343,546	352,054	54,200	56,514	57,897	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,878,003	1,867,005	21)
Municipal and Industrial	Colorado River Demand	af/yr	28,738	42,874	57,256	8,518	11,913	15,039	10,757	11,756	14,990	912	1,750	2,534	6,454	9,111	11,709	2,590	3,790	4,904	347,306	435,722	636,858	50,028	105,971	187,736	455,302	622,887	931,026	
Energy	Colorado River Demand	af/yr	2,000	3,200	4,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	51,400	57,600	
Minerals	Colorado River Demand	af/yr	9,667	16,200	16,740	4,833	8,100	8,100	10,333	17,550	17,820	950	1,530	1,620	4,717	8,820	8,820	1,000	900	900	0	0	0	0	0	0	31,500	53,100	54,000	
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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	
Tribal	Colorado River Demand	af/yr	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	

Source and Comments

1) Used estimated 2050 High irrigated acreage from SWSI Table 4-11 for 2060, linearly interpolated to estimate 2035
2) No estimates for increased in agricultural efficiency in SWSI - used 10% increase by 2060.
3) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
4) Per capita use decreases 25% by 2060 based on Statewide Water Supply Initiative Table 7-4 passive plus medium active conservation.
5) Assume 35% decrease from current projected based on technological efficiencies
6) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. Assumed to be 100 percent consumptive.
7) Mineral use not included in SWSI, assume 10% decrease from current projected in 2035 and in 2060 .
8) No changes from current projected
9) No changes from current projected
10) Used estimated 2050 Low irrigated acreage from SWSI Table 4-11 for 2060, linearly interpolated to estimate 2035.
11) No estimates for increased in agricultural efficiency in SWSI - used 10% increase by 2060.
12) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
13) Per capita use decreases 25% by 2060 based on Statewide Water Supply Initiative Table 7-4 passive plus medium active conservation.
14) Assume 35% decrease from current projected based on technological efficiencies
15) No changes from current projected
16) No changes from current projected
17) No changes from current projected
18) No changes from current projected
19) Demand that may be met from Other Supplies decreases based on full development of current water rights, expanded reuse of both transbasin and in-basin sources, and decreases yield from agricultural transfers estimated to decrease 20% from current levels by 2060 in the South Platte; and 10% from current levels in the Arkansas.
20) Total Adjacent Area demand less Demand that may be met by Other Supplies.
21) Agricultural Use is estimated to be same as current projected for Adjacent Areas. Remaining Adjacent Area use is estimated to be Municipal and Industrial.

TABLE C2-6
Total Demand within Study Area under Enhanced Environment (D1) Scenario

From Current Projected Data Sheet
Input Parameter
Computed

			COLORADO			93,400																							
		Planning Area	Colorado River			Gunnison			Yampa			White			San Juan			Dolores			South Platte			Arkansas			STATE TOTAL			Source and
Hydrologic Basin		Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	comments
Agricultural	Irrigated Acreage	acres	270,350	218,550	176,950	268,950	243,950	223,950	92,800	91,404	90,320	26,900	26,496	26,180	219,650	215,078	211,354	39,800	38,972	38,296							918,450	834,450	767,050	1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	6.85	6.85	6.89	6.89	6.89	4.44	4.44	4.44	10.25	10.25	10.25	3.52	3.52	3.52	3.70	3.70	3.70							5.79	5.70	5.62	2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%	
	Demand (Consumptive)	af/yr	**484,600**	**391,749**	**317,181**	**490,000**	**444,453**	**408,015**	**140,000**	**137,894**	**136,258**	**41,000**	**40,384**	**39,903**	**329,500**	**322,642**	**317,055**	**54,200**	**53,072**	**52,152**							**1,539,300**	**1,390,194**	**1,270,564**	
Municipal and Industrial	Population		356,500	558,000	836,000	120,800	184,000	244,000	42,000	65,000	113,000	10,200	16,000	28,000	84,700	129,500	175,000	36,300	55,500	75,000							650,500	1,008,000	1,471,000	3)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	163	140	173	156	134	228	205	177	228	205	177	182	164	141	182	164	141							183	165	143	4)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%	
	Municipal and Industrial Demand (Consumptive)	af/yr	25,298	35,659	45,886	8,193	11,253	12,819	3,754	5,224	7,841	912	1,286	1,943	6,044	8,326	9,674	2,590	3,568	4,146							46,791	65,317	82,308	
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	2,236	2,236	325	211	211	7,003	4,552	4,552	0	0	0	410	267	267	0	0	0							11,178	7,266	7,266	5)
	Demand (Consumptive)	af/yr	**28,738**	**37,895**	**48,122**	**8,518**	**11,465**	**13,030**	**10,757**	**9,776**	**12,393**	**912**	**1,286**	**1,943**	**6,454**	**8,593**	**9,940**	**2,590**	**3,568**	**4,146**							**57,969**	**72,583**	**89,574**	
Energy	**Demand (Consumptive)**	af/yr	**2,000**	**3,200**	**4,700**	**0**	**0**	**0**	**24,633**	**40,300**	**42,200**	**1,250**	**4,000**	**5,800**	**2,233**	**3,900**	**4,900**	**0**	**0**	**0**							**30,117**	**51,400**	**57,600**	6)
Minerals	**Demand (Consumptive)**	af/yr	**9,667**	**16,200**	**16,740**	**4,833**	**8,100**	**8,100**	**10,333**	**17,550**	**17,820**	**950**	**1,530**	**1,620**	**4,717**	**8,820**	**8,820**	**1,000**	**900**	**900**							**31,500**	**53,100**	**54,000**	7)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	8)
Tribal	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	9)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**525,004**	**449,044**	**386,743**	**503,352**	**464,017**	**429,144**	**185,724**	**205,520**	**208,671**	**44,112**	**47,200**	**49,266**	**342,904**	**343,955**	**340,715**	**57,790**	**57,541**	**57,198**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,885**	**1,567,276**	**1,471,738**	
Adjacent Areas																													
Agricultural	Irrigated Acreage	acres																			827,500	803,200	780,900	427,833	426,700	425,600	1,255,333	1,229,900	1,206,500	10)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.50	3.50	3.97	3.97	3.97	3.66	3.66	3.66	11)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%	
	Demand (Diversion)	af/yr																			**2,892,765**	**2,807,817**	**2,729,861**	**1,700,338**	**1,695,833**	**1,691,462**	**4,593,102**	**4,503,650**	**4,421,323**	
	Demand (Consumptive)	af/yr																			**1,112,295**	**1,079,632**	**1,049,657**	**543,348**	**541,909**	**540,512**	**1,655,644**	**1,621,541**	**1,590,169**	
Municipal and Industrial	Population																				3,944,750	5,244,000	6,580,700	1,079,250	1,451,000	1,846,000	5,024,000	6,695,000	8,426,700	12)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	153	132	184	166	143	173	156	134	13)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%	
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	898,730	973,019	222,441	269,805	295,694	973,620	1,168,535	1,268,713	
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	38,350	38,350	49,400	32,110	32,110	108,400	70,460	70,460	14)
	Demand (Diversion)	af/yr																			**810,179**	**937,080**	**1,011,369**	**271,841**	**301,915**	**327,804**	**1,082,020**	**1,238,995**	**1,339,173**	
	Demand (Consumptive)	af/yr																			**283,563**	**327,978**	**353,979**	**95,144**	**105,670**	**114,731**	**378,707**	**433,648**	**468,711**	
Energy	**Demand (Diversion)**	af/yr																			35,733	44,746	53,460	9,950	13,877	16,560	**45,683**	**58,623**	**70,020**	15)
Minerals	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	17)
Tribal	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	18)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,789,643**	**3,794,690**	**1,982,129**	**2,011,626**	**2,035,826**	**5,720,806**	**5,801,269**	**5,830,516**	
Total Demand in the Study Area		af/yr	**525,004**	**449,044**	**386,743**	**503,352**	**464,017**	**429,144**	**185,724**	**205,520**	**208,671**	**44,112**	**47,200**	**49,266**	**342,904**	**343,955**	**340,715**	**57,790**	**57,541**	**57,198**	**3,738,677**	**3,789,643**	**3,794,690**	**1,982,129**	**2,011,626**	**2,035,826**	**7,379,691**	**7,368,545**	**7,302,254**	
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	3,161,636	3,108,230	1,783,841	1,775,913	1,766,003	4,988,202	4,937,549	4,874,232	19)
Potential Colorado River Demand		af/yr	**525,004**	**449,044**	**386,743**	**503,352**	**464,017**	**429,144**	**185,724**	**205,520**	**208,671**	**44,112**	**47,200**	**49,266**	**342,904**	**343,955**	**340,715**	**57,790**	**57,541**	**57,198**	534,317	628,007	686,460	198,288	235,713	269,823	**2,391,490**	**2,430,997**	**2,428,021**	20)
Agricultural	Colorado River Demand	af/yr	484,600	391,749	317,181	490,000	444,453	408,015	140,000	137,894	136,258	41,000	40,384	39,903	329,500	322,642	317,055	54,200	53,072	52,152	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,725,465	1,605,835	21)
Municipal and Industrial	Colorado River Demand	af/yr	28,738	37,895	48,122	8,518	11,465	13,030	10,757	9,776	12,393	912	1,286	1,943	6,454	8,593	9,940	2,590	3,568	4,146	347,306	440,996	499,449	50,028	87,453	121,563	455,302	601,032	710,586	
Energy	Colorado River Demand	af/yr	2,000	3,200	4,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	51,400	57,600	
Minerals	Colorado River Demand	af/yr	9,667	16,200	16,740	4,833	8,100	8,100	10,333	17,550	17,820	950	1,530	1,620	4,717	8,820	8,820	1,000	900	900	0	0	0	0	0	0	31,500	53,100	54,000	
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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	
Tribal	Colorado River Demand	af/yr	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	

Source and Comments

1) Calculated medium decrease in acreage due to urbanization using low and high acreage decreased from SWSI Table 4-11 and low, high, an medium population projections from SWSI Table 4-1.
2) No changes from current projected
3) No changes from current projected
4) Per capita use decreases 0.5% per year per Conservation Group recommendation
5) Assume 35% decrease from current projected based on technological efficiencies
6) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. Assumed to be 100 percent consumptive.
7) Mineral use not included in SWSI, assume 10% decrease from current projected in 2035 and in 2060 .
8) No changes from current projected
9) No changes from current projected
10) Calculated medium decrease in acreage due to urbanization using low and high acreage decreased from SWSI Table 4-11 and low, high, an medium population projections from SWSI Table 4-1.
11) No changes from current projected
12) Used medium population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins.
13) Per capita use decreases 0.5% per year per Conservation Group recommendation
14) Assume 35% decrease from current projected based on technological efficiencies
15) No changes from current projected
16) No changes from current projected
17) No changes from current projected
18) No changes from current projected
19) Demand that may be met from Other Supplies decreases based on expanded reuse of both transbasin and in-basin sources, estimated to decrease 3% from current levels by 2060 in the South Platte; and 1% from current levels in the Arkansas.
20) Total Adjacent Area demand less Demand that may be met by Other Supplies.
21) Agricultural Use is estimated to be same as current projected for Adjacent Areas. Remaining Adjacent Area use is estimated to be Municipal and Industrial.

TABLE C2-7
Total Demand within Study Area under Enhanced Environment (D2) Scenario

From Current Projected Data Sheet
Input Parameter
Computed

			COLORADO																													
		Planning Area	Colorado River			Gunnison			Yampa			White			San Juan			Dolores			South Platte			Arkansas			STATE TOTAL			Source and
Hydrologic Basin		Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	comments
Agricultural	Irrigated Acreage	acres	270,350	270,350	270,350	268,950	268,950	268,950	92,800	92,800	92,800	26,900	26,900	26,900	219,650	219,650	219,650	39,800	39,800	39,800							918,450	918,450	918,450	1)
	Per-Acre Water Delivery (Diversion)	af/ac/yr	6.85	7.26	7.53	6.89	7.31	7.58	4.44	4.71	4.89	10.25	10.86	11.27	3.52	3.73	3.87	3.70	3.92	4.07							5.79	6.13	6.36	2)
	Consumptive factor	%	26%	26%	26%	26%	26%	26%	34%	34%	34%	15%	15%	15%	43%	43%	43%	37%	37%	37%							29%	29%	29%	
	Demand (Consumptive)	af/yr	**484,600**	**513,676**	**533,060**	**490,000**	**519,400**	**539,000**	**140,000**	**148,400**	**154,000**	**41,000**	**43,460**	**45,100**	**329,500**	**349,270**	**362,450**	**54,200**	**57,452**	**59,620**							**1,539,300**	**1,631,658**	**1,693,230**	
Municipal and Industrial	Population		356,500	628,210	967,860	120,800	188,910	274,060	42,000	88,340	146,280	10,200	21,460	35,520	84,700	135,900	199,900	36,300	58,240	85,670							650,500	1,121,060	1,709,290	3)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd	181	165	145	173	158	138	228	208	182	228	208	182	182	166	146	182	166	146							183	168	148	4)
	Consumptive factor	%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%							35%	35%	35%	
	Municipal and Industrial Demand (Consumptive)	af/yr	25,298	40,638	55,020	8,193	11,702	14,827	3,754	7,204	10,438	912	1,750	2,534	6,044	8,844	11,442	2,590	3,790	4,904							46,791	73,928	99,166	
	Self Served Industrial Demand (Consumptive)	af/yr	3,440	2,236	2,236	325	211	211	7,003	4,552	4,552	0	0	0	410	267	267	0	0	0							11,178	7,266	7,266	5)
	Demand (Consumptive)	af/yr	**28,738**	**42,874**	**57,256**	**8,518**	**11,913**	**15,039**	**10,757**	**11,756**	**14,990**	**912**	**1,750**	**2,534**	**6,454**	**9,111**	**11,709**	**2,590**	**3,790**	**4,904**							**57,969**	**81,194**	**106,432**	
Energy	**Demand (Consumptive)**	af/yr	**2,000**	**3,200**	**4,700**	**0**	**0**	**0**	**24,633**	**40,300**	**42,200**	**1,250**	**4,000**	**5,800**	**2,233**	**3,900**	**4,900**	**0**	**0**	**0**							**30,117**	**51,400**	**57,600**	6)
Minerals	**Demand (Consumptive)**	af/yr	**9,667**	**16,200**	**16,740**	**4,833**	**8,100**	**8,100**	**10,333**	**17,550**	**17,820**	**950**	**1,530**	**1,620**	**4,717**	**8,820**	**8,820**	**1,000**	**900**	**900**							**31,500**	**53,100**	**54,000**	7)
Fish, Wildlife, and Recreation	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	8)
Tribal	**Demand (Consumptive)**	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	9)
Total Hydrologic Basin	**Demand (Consumptive)**	af/yr	**525,004**	**575,950**	**611,756**	**503,352**	**539,413**	**562,139**	**185,724**	**218,006**	**229,010**	**44,112**	**50,740**	**55,054**	**342,904**	**371,101**	**387,879**	**57,790**	**62,142**	**65,424**	**0**	**0**	**0**	**0**	**0**	**0**	**1,658,885**	**1,817,352**	**1,911,262**	
Adjacent Areas																																
Agricultural	Irrigated Acreage	acres																			827,500	810,000	789,000	427,833	427,000	426,000	1,255,333	1,237,000	1,215,000	10)
	Per-Acre Water Delivery (Diversion)	af/ac/yr																			3.50	3.57	3.67	3.97	4.06	4.17	3.66	3.74	3.85	11)
	Consumptive factor	%																			38%	38%	38%	32%	32%	32%	36%	36%	36%	
	Demand (Diversion)	af/yr																			**2,892,765**	**2,893,883**	**2,896,086**	**1,700,338**	**1,734,360**	**1,777,704**	**4,593,102**	**4,628,244**	**4,673,790**	
	Demand (Consumptive)	af/yr																			**1,112,295**	**1,112,726**	**1,113,572**	**543,348**	**554,220**	**568,071**	**1,655,644**	**1,666,946**	**1,681,643**	
Municipal and Industrial	Population																				3,944,750	5,461,460	7,357,360	1,079,250	1,514,540	2,058,640	5,024,000	6,976,000	9,416,000	12)
	Municipal and Industrial Per Capita Use (Diversion)	gpcd																			170	155	136	184	168	147	173	158	138	13)
	Consumptive factor	%																			35%	35%	35%	35%	35%	35%	35%	35%	35%	
	Municipal and Industrial Demand (Diversion)	af/yr																			751,179	948,234	1,120,820	222,441	285,013	338,979	973,620	1,233,247	1,459,800	
	Self Served Industrial Demand (Diversion)	af/yr																			59,000	38,350	38,350	49,400	32,110	32,110	108,400	70,460	70,460	14)
	Demand (Diversion)	af/yr																			**810,179**	**986,584**	**1,159,170**	**271,841**	**317,123**	**371,089**	**1,082,020**	**1,303,707**	**1,530,260**	
	Demand (Consumptive)	af/yr																			**283,563**	**345,304**	**405,710**	**95,144**	**110,993**	**129,881**	**378,707**	**456,298**	**535,591**	
Energy	**Demand (Diversion)**	af/yr																			35,733	47,400	59,400	9,950	14,700	18,400	**45,683**	**62,100**	**77,800**	15)
Minerals	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	16)
Fish, Wildlife, and Recreation	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	17)
Tribal	**Demand (Diversion)**	af/yr																			0	0	0	0	0	0	**0**	**0**	**0**	18)
Total Adjacent Areas	Demand (Diversion)	af/yr	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,738,677**	**3,927,868**	**4,114,656**	**1,982,129**	**2,066,184**	**2,167,193**	**5,720,806**	**5,994,051**	**6,281,849**	
Total Demand in the Study Area		af/yr	**525,004**	**575,950**	**611,756**	**503,352**	**539,413**	**562,139**	**185,724**	**218,006**	**229,010**	**44,112**	**50,740**	**55,054**	**342,904**	**371,101**	**387,879**	**57,790**	**62,142**	**65,424**	**3,738,677**	**3,927,868**	**4,114,656**	**1,982,129**	**2,066,184**	**2,167,193**	**7,379,691**	**7,811,403**	**8,193,111**	
Demand that may be met by Other Supplies		af/yr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,204,361	3,268,433	3,314,565	1,783,841	1,813,084	1,848,373	4,988,202	5,081,517	5,162,938	19)
Potential Colorado River Demand		af/yr	**525,004**	**575,950**	**611,756**	**503,352**	**539,413**	**562,139**	**185,724**	**218,006**	**229,010**	**44,112**	**50,740**	**55,054**	**342,904**	**371,101**	**387,879**	**57,790**	**62,142**	**65,424**	534,317	659,434	800,091	198,288	253,099	318,820	**2,391,490**	**2,729,886**	**3,030,173**	20)
Agricultural	Colorado River Demand	af/yr	484,600	513,676	533,060	490,000	519,400	539,000	140,000	148,400	154,000	41,000	43,460	45,100	329,500	349,270	362,450	54,200	57,452	59,620	187,011	187,011	187,011	148,260	148,260	148,260	1,874,571	1,966,929	2,028,501	21)
Municipal and Industrial	Colorado River Demand	af/yr	28,738	42,874	57,256	8,518	11,913	15,039	10,757	11,756	14,990	912	1,750	2,534	6,454	9,111	11,709	2,590	3,790	4,904	347,306	472,423	613,080	50,028	104,839	170,560	455,302	658,457	890,072	
Energy	Colorado River Demand	af/yr	2,000	3,200	4,700	0	0	0	24,633	40,300	42,200	1,250	4,000	5,800	2,233	3,900	4,900	0	0	0	0	0	0	0	0	0	30,117	51,400	57,600	
Minerals	Colorado River Demand	af/yr	9,667	16,200	16,740	4,833	8,100	8,100	10,333	17,550	17,820	950	1,530	1,620	4,717	8,820	8,820	1,000	900	900	0	0	0	0	0	0	31,500	53,100	54,000	
Fish, Wildlife, and Recreation	Colorado River Demand	af/yr	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	
Tribal	Colorado River Demand	af/yr	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	

Source and Comments

1) No changes from current projected
2) No reference. Assume 10% increase from current projected by 2060
3) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
4) Per capita use decreases 25% by 2060 based on Statewide Water Supply Initiative Table 7-4 passive plus medium active conservation.
5) Assume 35% decrease from current projected based on technological efficiencies
6) Energy demands based on SWSI Table 4-8. Includes "Energy Development" and Thermoelectric" categories through 2050. Assumed to be 100 percent consumptive.
7) Mineral use not included in SWSI, assume 10% decrease from current projected in 2035 and in 2060 .
8) No changes from current projected
9) No changes from current projected
10) No changes from current projected
11) No reference. Assume 5% increase from current projected by 2060
12) Used high population estimates from the Statewide Water Supply Initiative Table 4-1 for all basins. 2035 and 2060 interpolated from 2015 estimates and 2050 high estimates.
13) Per capita use decreases 25% by 2060 based on Statewide Water Supply Initiative Table 7-4 passive plus medium active conservation.
14) Assume 35% decrease from current projected based on technological efficiencies
15) No changes from current projected
16) No reference. Assume 10% decrease from current projected in 2035 and in 2060
17) No changes from current projected
18) No changes from current projected
19) No changes from current projected
20) Total Adjacent Area demand less Demand that may be met by Other Supplies.
21) Agricultural Use is estimated to be same as current projected for Adjacent Areas. Remaining Adjacent Area use is estimated to be Municipal and Industrial.

4.0 References

Colorado Water Conservation Board (CWCB). 2010a. *Statewide Water Supply Initiative*.

Colorado Water Conservation Board (CWCB). 2010b. *2050 M&I Water User Projections. Appendix F*.

Colorado Water Conservation Board (CWCB). 2012. Personal communication with Reclamation.