

**MUNICIPAL AND INDUSTRIAL  
WATER SUPPLY AND USES  
IN THE  
WEST COLORADO RIVER BASIN**

**(Data Collected for Calendar-Year 2005)**

**Prepared by**

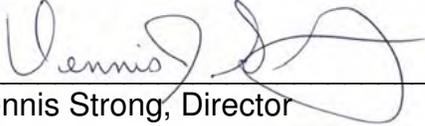
**Utah Department of Natural Resources  
Division of Water Resources**

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Dennis Strong, Director



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## EXECUTIVE SUMMARY

This document describes the municipal and industrial (M&I) water supplies and uses within the West Colorado River Basin during the calendar year of 2005. These water systems deliver culinary (potable) and/or secondary (non-potable) water and have been separated into four categories, as defined on page 18 of this report. The four categories are public community, public non-community, self-supplied industrial and private domestic water systems. Water supplies, under the current hydrologic and each systematic condition, are evaluated for only potable water service in public community water systems.

The base data for both water supply and uses of public community water systems was provided by each of the water systems. Data for the other categories of water systems was compiled by also using various other agencies and references.

M&I water uses, for the basin, were then totaled and tabulated by county. All or portions of twelve counties comprise the West Colorado River Basin: Carbon, Duchesne, Emery, Garfield, Grand, Kane, San Juan, Sanpete, Sevier, Utah Wasatch and Wayne. Duchesne, Utah and Wasatch Counties have no public water systems or uses in the West Colorado River Basin.

### **Public Community Water Systems**

Of the aforementioned categories, public community systems serve about 95 percent of all residents in the State of Utah. Within the West Colorado River Basin, approximately 97 percent of the population is served by 26 public community water systems. Refer to **Figure 3** on page 5 for a location map of these systems, as well as the general boundaries of the basin.

For planning purposes, accurate and detailed current water use and supply information is invaluable in determining the ability of the basin to meet future water demands. The Division of Water Resources (DWRe) uses the annual reliable potable water supply, as defined on page 9, as a tool to quantify the amount of water that

can be delivered by each public community water system to satisfy current and projected peak day demands with present water supply conditions.

In the West Colorado River basin, it was determined that the current annual reliable potable water supply is about 29,428 acre-feet. Springs account for 17 percent, wells 15 percent and surface waters 68 percent of this supply. The breakdown of this supply is presented in the following **Table I**.

**TABLE I**  
**WEST COLORADO RIVER BASIN**  
**Reliable Potable Water Supply for Public Community Systems**  
**(Acre-Feet/Year)**

County	Springs	Wells	Surface	Totals
<b>Carbon</b>	2,642.4	2,161.0	9,954.7	<b>14,758.1</b>
<b>Emery</b>	72.8	362.0	10,072.6	<b>10,507.4</b>
<b>Garfield</b>	231.3	842.3	0.0	<b>1,073.6</b>
<b>Grand</b>	362.0	0.0	0.0	<b>362.0</b>
<b>Kane</b>	0.0	120.9	0.0	<b>120.9</b>
<b>San Juan</b>	0.0	105.7	0.0	<b>105.7</b>
<b>Sanpete</b>	0.0	0.0	0.0	<b>0.0</b>
<b>Sevier</b>	0.0	0.0	0.0	<b>0.0</b>
<b>Utah</b>	0.0	0.0	0.0	<b>0.0</b>
<b>Wayne</b>	1,768.8	731.4	0.0	<b>2,500.2</b>
<b>Basin Totals</b>	<b>5,077.2</b>	<b>4,323.4</b>	<b>20,027.3</b>	<b>29,427.8</b>

M&I water use, within these systems, can be subdivided by two types of water: potable (culinary) and non-potable (secondary). Potable water is delivered by the public community system itself. However, secondary water can be delivered not only by the system, but also by separate irrigation companies, exclusively in some locations.

**Table II**, on the following page, shows public community system water use data for both potable and non-potable categories within the West Colorado River Basin. Categorically, the percentage of total water use was 26% residential indoor, 50% residential outdoor, 6% commercial, 16% institutional, and 2% light industrial/stockwatering.

**TABLE II**  
**WEST COLORADO RIVER BASIN**  
**Water Use for Public Community Systems**  
**(Acre-Feet/Year)**

	Carbon County	Emery County	Garfield County	Grand County	Kane County	San Juan County	Sanpete County	Sevier County	Utah County	Wayne County	Total
<b>Potable Use</b>											
Residential Indoor	1,616.1	852.4	87.1	7.0	43.6	22.2	0.0	0.0	0.0	216.2	2,844.6
Residential Outdoor	1,771.6	792.3	64.9	6.5	22.8	32.9	0.0	0.0	0.0	122.7	2,813.5
Commercial	363.8	179.8	73.6	5.5	189.1	9.7	0.0	0.0	0.0	57.4	879.0
Institutional	582.5	41.0	22.1	11.9	0.0	0.0	0.0	0.0	0.0	20.9	678.4
Industrial/Stockwater	89.1	43.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	61.3	200.0
<b>Total Potable</b>	<b>4,423.1</b>	<b>1,909.2</b>	<b>253.5</b>	<b>30.9</b>	<b>255.5</b>	<b>64.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>478.5</b>	<b>7,415.5</b>
<b>Secondary Use</b>											
Residential	1,261.7	581.6	255.6	0.0	0.0	0.0	0.0	0.0	0.0	450.0	2,548.9
Commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Institutional	410.4	518.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	968.6
Industrial/Stockwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Secondary</b>	<b>1,672.1</b>	<b>1,099.8</b>	<b>255.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>490.0</b>	<b>3,517.5</b>
<b>TOTAL WATER USE</b>	<b>6,095.2</b>	<b>3,009.0</b>	<b>509.1</b>	<b>30.9</b>	<b>255.5</b>	<b>64.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>968.5</b>	<b>10,933.0</b>

In general, and specifically for this report, all per capita water use figures refer to the water use within public community water systems only. Out of a total basin population of 34,560 in 2005, 33,580 people were served by the public community systems. For these systems, residential potable per capita water use calculates to 150 gallons per capita per day (gpcd). Similarly, non-potable residential water use calculated to 68 gpcd. The resultant total per capita water use is 218 gpcd for residential purposes within the public community systems of the basin. With the addition of water use in the commercial, institutional and industrial categories, the per capita water use for public community systems is 197 gpcd for potable and 94 gpcd for non-potable water, for an overall water use of approximately 291 gpcd. Comparatively, in 2005, the statewide average per capita water use was 190 gpcd potable and 70 gpcd non-potable, for a total of 260 gpcd.

Dry summer months, a long growing season and comparatively large lot sizes, in this basin, greatly increase the outside watering requirements compared with the more densely populated basins along the Wasatch Front. Additionally, secondary (non-potable) water comprises a relatively high percentage of the residential and institutional outdoor use. Considering that secondary water is rarely metered, its use tends to far exceed outdoor watering needs. Combined, these factors all contribute to the above average per capita water use, in this basin. The per capita water use values for various combinations of categories and types of water are shown in the following **Table III**.

**TABLE III**  
**WEST COLORADO RIVER BASIN**  
**Average Per Capita Use**  
**(Supplied by Public Community Systems)**

CATEGORY	Average Per Capita Use (Ac-Ft/Yr)	Average Per Capita Use (GPCD)
Residential Potable Use	0.168	150
Residential Potable Plus Secondary Use	0.244	218
Total Potable Use	0.221	197
Total Potable Plus Secondary Use	0.326	291

Note: Total Potable categories include residential, commercial, institutional and industrial uses.

### **Total M&I Water Use**

**Table IV**, on the following page, shows the total potable and non-potable M&I water use for all system types in the West Colorado River Basin for the year 2005. As can be seen, public community systems deliver the majority of the potable water used within the basin. However, in this basin, self-supplied industries use significant amounts of non-potable water. The table indicates that the total potable M&I water use in 2005 was 8,115 acre-feet. Total non-potable M&I water use in 2005 for the basin was 35,913 acre-feet. Therefore, total M&I water use for all system categories and types of water in 2005, for the West Colorado River basin, was 44,028 acre-feet.

**TABLE IV  
WEST COLORADO RIVER BASIN  
Water Use for all Categories  
(Acre-Feet/Year)**

Source	Carbon County	Emery County	Garfield County	Grand County	Kane County	San Juan County	Sanpete County	Sevier County	Utah County	Wasatch County	Wayne County	Total
<b>Potable Use</b>												
Public Community Systems	4,423.1	1,909.2	253.5	30.9	255.5	64.9	0.0	0.0	0.0	0.0	478.5	7,415.5
Public Non-Community Systems	37.8	20.9	9.6	0.0	0.0	4.4	5.4	45.5	0.0	0.0	14.1	137.7
Self-Supplied Industries	51.4	385.3	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	446.8
Private Domestic	24.0	5.0	10.0	0.0	0.0	0.0	0.0	5.0	4.9	1.7	65.0	115.6
<b>Total Potable</b>	<b>4,536.3</b>	<b>2,320.4</b>	<b>283.1</b>	<b>30.9</b>	<b>255.5</b>	<b>69.3</b>	<b>5.4</b>	<b>50.5</b>	<b>4.9</b>	<b>1.7</b>	<b>557.6</b>	<b>8,115.5</b>
<b>Secondary Use</b>												
Secondary Irrigation Companies	1,672.1	1,099.8	255.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	490.0	3,517.5
Public Non-Community Systems	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Self-Supplied Industries	3,838.5	28,556.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32,395.4
<b>Total Secondary</b>	<b>5,510.6</b>	<b>29,656.6</b>	<b>255.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>490.0</b>	<b>35,912.9</b>
<b>TOTAL WATER USE</b>	<b>10,046.9</b>	<b>31,977.0</b>	<b>538.7</b>	<b>30.9</b>	<b>255.5</b>	<b>69.3</b>	<b>5.4</b>	<b>50.5</b>	<b>4.9</b>	<b>1.7</b>	<b>1,047.6</b>	<b>44,028.4</b>

### **M&I Water Deliveries and Depletions**

On the following page, **Table V** shows both the deliveries and depletions for all the M&I water in the basin. The information contained in the table is very useful for overall water planning purposes. See pages 20 and 21 for detailed definitions of the terms used. In **Appendix B**, there is a table that contains a breakdown of all the deliveries and depletions of each public community water system, as well as all other categories of water systems, within the basin.

**TABLE V**  
**WEST COLORADO RIVER BASIN**  
**M&I Deliveries and Depletions**  
**(Acre-Foot / Year)**

County	Deliveries			Depletions		
	Indoor Use	Outdoor Use	Total	Indoor Use	Outdoor Use	Total
<b>Carbon</b>	6,044.0	4,003.0	<b>10,046.9</b>	4,266.3	2,668.6	<b>6,934.9</b>
<b>Emery</b>	30,001.6	1,975.4	<b>31,977.0</b>	29,783.4	1,316.9	<b>31,100.4</b>
<b>Garfield</b>	176.2	362.5	<b>538.7</b>	114.1	241.7	<b>355.7</b>
<b>Grand</b>	13.8	17.1	<b>30.9</b>	1.0	11.4	<b>12.3</b>
<b>Kane</b>	194.9	60.6	<b>255.5</b>	79.1	40.4	<b>119.5</b>
<b>San Juan</b>	33.8	35.4	<b>69.3</b>	30.2	23.6	<b>53.8</b>
<b>Sanpete</b>	3.2	2.2	<b>5.4</b>	0.2	1.4	<b>1.7</b>
<b>Sevier</b>	28.3	22.2	<b>50.5</b>	18.0	14.8	<b>32.7</b>
<b>Utah</b>	3.9	1.0	<b>4.9</b>	0.3	0.7	<b>0.9</b>
<b>Wasatch</b>	1.4	0.3	<b>1.7</b>	0.1	0.2	<b>0.3</b>
<b>Wayne</b>	387.0	660.6	<b>1,047.6</b>	83.8	440.4	<b>524.2</b>
<b>Basin Totals</b>	<b>36,888.1</b>	<b>7,140.2</b>	<b>44,028.4</b>	<b>34,376.3</b>	<b>4,760.2</b>	<b>39,136.5</b>

## INTRODUCTION

### Authority

The Utah Division of Water Resources (DWRe) has the overall responsibility for completing studies, investigations, and plans to assist the responsible development and utilization of the water resources of the state of Utah. The State Water Plan, prepared and distributed in early 1990 by the division, provided the foundation and overall direction to establish and implement the state policy framework of water management. As part of the state water planning process, the division prepares detailed plans for each of the 11 hydrologic basins in the state. The West Colorado River Basin is one of these 11 basins. A location map of the West Colorado River Basin is shown in **Figure 1** on page 4.

Each basin water plan identifies potential conservation and development projects and describes alternatives to efficiently satisfy the water needs of that basin. As part of this effort, background data reports are completed for each river basin. These include a Water-Related Land Use Report and a Municipal & Industrial Water Supply & Use Report.

### Scope

As stated earlier, the subject of this M&I report is a determination of present M&I water supplies and uses within this basin. The data presented in this report may be used in the State Water Plan for the West Colorado River Basin as well as other division reports and studies. Information considered for this report also includes related investigations recently completed by the DWRe and the Utah Division of Water Rights (DWRi).

## **Data Collection**

This study was initiated in October 2005. The 2005 *Municipal and Industrial Water Use Forms*, distributed by the DWRi, in cooperation with the DWRe and the Utah Division of Drinking Water, were used as the basis for the study. In all counties, the data collection process is as described in the following section, *Water Supply and Use Methodology*. Water rights discussions presented herein were prepared based on information from the DWRi.

## **General Description of the Basin**

The West Colorado River Basin includes approximately 15,411 square miles of land. The boundary starts at Soldier Summit and follows a clockwise path which includes the Roan Cliffs, followed by a south trending line toward Elk Ridge, then along the ridge tops to the Clay Hills, the Straight Cliffs of the Kaiporowits Plateau, the Aquarius Plateau, the Awapa Plateau and finally the Wasatch Plateau and back to Soldier Summit.

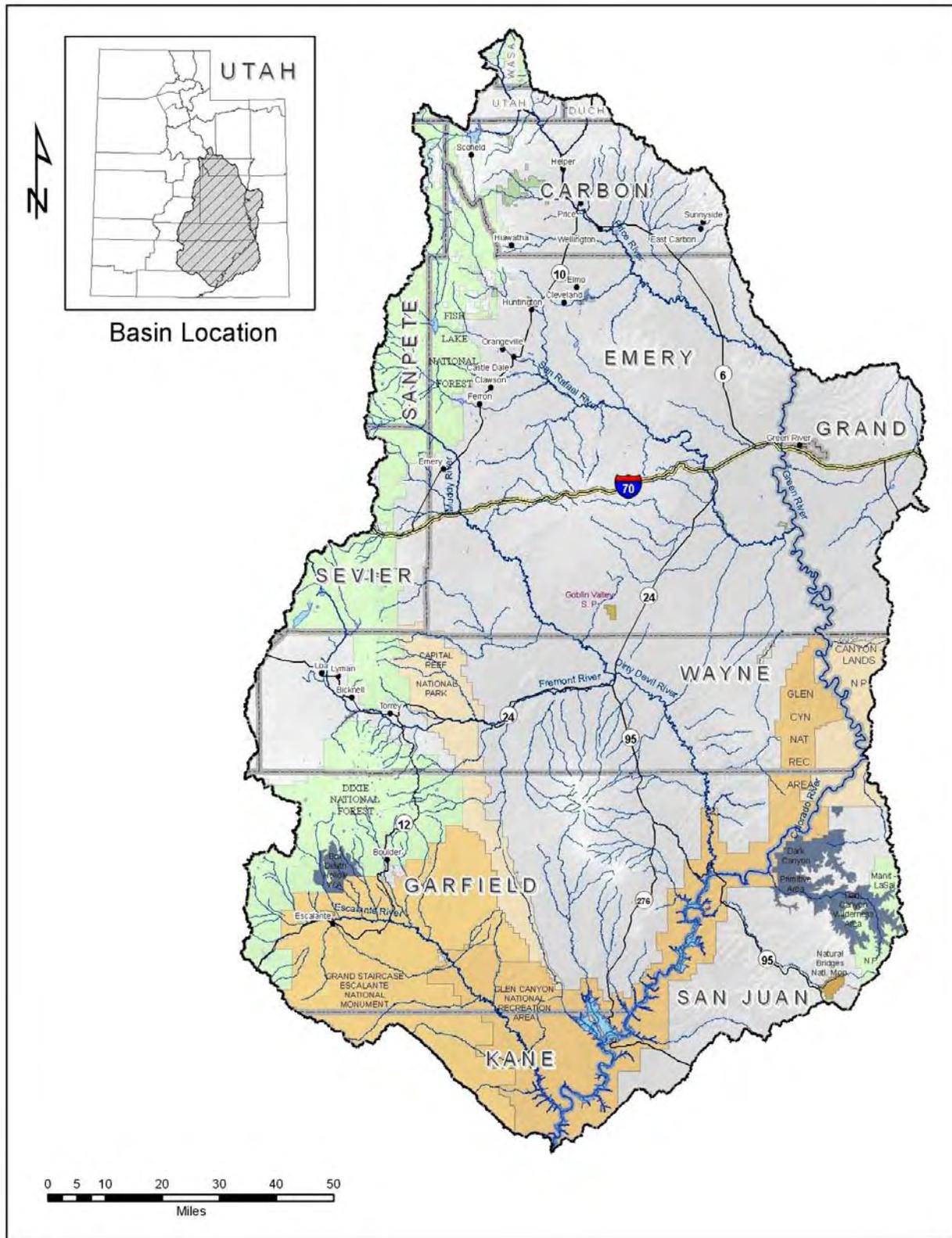
The basin spans all or part of 12 counties: Carbon, Duchesne, Emery, Garfield, Grand, Kane San Juan, Sanpete, Sevier, Utah, Wasatch and Wayne. Duchesne, Utah and Wasatch Counties contain no public water systems in this basin.

The basin contains a widely varied topography. Elevations within the basin vary from less than 4,000 feet above mean sea level at the south tip the basin and gradually increase throughout the basin to the mountains and plateaus. Mount Ellen, in the Henry Mountains is 11,522 feet above mean sea level. Boulder Mountain on the Aquarius Plateau is 11,360 feet above sea level. Notable features of the basin include Capitol Reef National Park, Arches National Park, Lake Powell and portions of Bryce Canyon National Park. The principal river system in the basin is the Colorado River and its tributaries. **Figure 1**, on page 4, is a detailed map of the basin.

There are currently 26 public community systems in the West Colorado River Basin. These systems serve roughly 33, 580 people (about 97 percent of the 34,560 total population within the basin). The basin also has 46 public non-community systems. These systems serve Glen Canyon National Recreation Area (Lake Powell), state parks, summer home communities, private and public campgrounds, isolated commercial establishments, roadside rest stops and parks. **Figure 2** on page 5, shows the location of these systems.

M&I water use is steadily increasing within the basin. Tourism and industry are driving most of this growth. This trend is likely to continue well into the future.

Figure 1. West Colorado River Basin Drainage and Location Map



- PUBLIC COMMUNITY SYSTEMS**
- Carbon County**
- 1 East Carbon & Columbia Municipal
  - 2 Helper Municipal Water System
  - 3 Price Municipal Water System
  - 4 Price River WID
  - 5 Spring Glen Water Company
  - 6 Sunnyside City Water
  - 7 Wellington Culinary Water
- Emery County**
- 8 Castle Valley SSD
  - 9 Green River Municipal Water
  - 10 North Emery Water Users
  - 11 Trail Canyon Residential System
- Garfield County**
- 12 Boulder Farmstead Water Company
  - 13 Escalante Culinary Water
  - 14 Ticaboo Special Service District
- Grand County**
- 15 Thompson WID
- Kane County**
- 16 National Park Service, Bullfrog
- San Juan County**
- 17 National Park Service, Halls Cross
- Wayne County**
- 18 Bicknell Culinary Water System
  - 19 Caineville SSD
  - 20 Capitol Reef National Park
  - 21 Fremont Waterworks Company
  - 22 Hanksville Culinary Water Work
  - 23 Loa Water Works Company
  - 24 Lyman Culinary Water System
  - 25 Teasdale SSD
  - 26 Torrey Culinary Water System
- PUBLIC NON-COMMUNITY SYSTEMS**
- Carbon County**
- A Aspen Cove
  - B Aspen View
  - C Clear Creek Camp
  - D Clear Creek Utilities
  - E Madsen Bay
  - F Mountain View
  - G Price Cyn. Rec. Area
  - H Scofield (town)
  - I Scofield Frontier Camp
  - J Scofield Res. Camp
- Emery County**
- K Cleveland Lloyd Quarry
  - L Filmore Subdivision
  - M Forks of Huntington CG
  - N Goblin Valley State Park
  - O Indian Creek CG
  - P Joes Valley Campground
  - Q Old Folks Flat CG
- Garfield County**
- R Blue Spruce CG
  - S Boulder Mountain Lodge
  - T Boulder School
  - U Calf Creek CG
  - V Lake Powell Management
  - W Pleasant Creek CG
  - X Posy Lake CG
- San Juan County**
- Y Hite Marina
  - Z Natural Bridges
- San Pete County**
- AA Fairview Lakes Development
  - BB Ferron Reservoir CG
  - CC Flat Canyon CG
  - DD Mammoth Guard Station
  - EE Twelve Mile Flat CG
- Sevier County**
- FF Bowery Haven Resort
  - GG Bowery Springs CG
  - HH Doctor Spring CG
  - II Fish Lake Lodge
  - JJ Frying Pan CG
  - KK Lakeside Resort
  - LL Lakeview Subdivision
  - MM Twin Creeks CG
- Wayne County**
- NN Boulder Mountain Homestead RV Park
  - OO Elkhorn CG & GS
  - PP Hollow Mountain
  - QQ Red Rock Cafe
  - RR Single Tree CG
  - SS Sleepy Hollow CG
  - TT Thousand Lakes RV Park

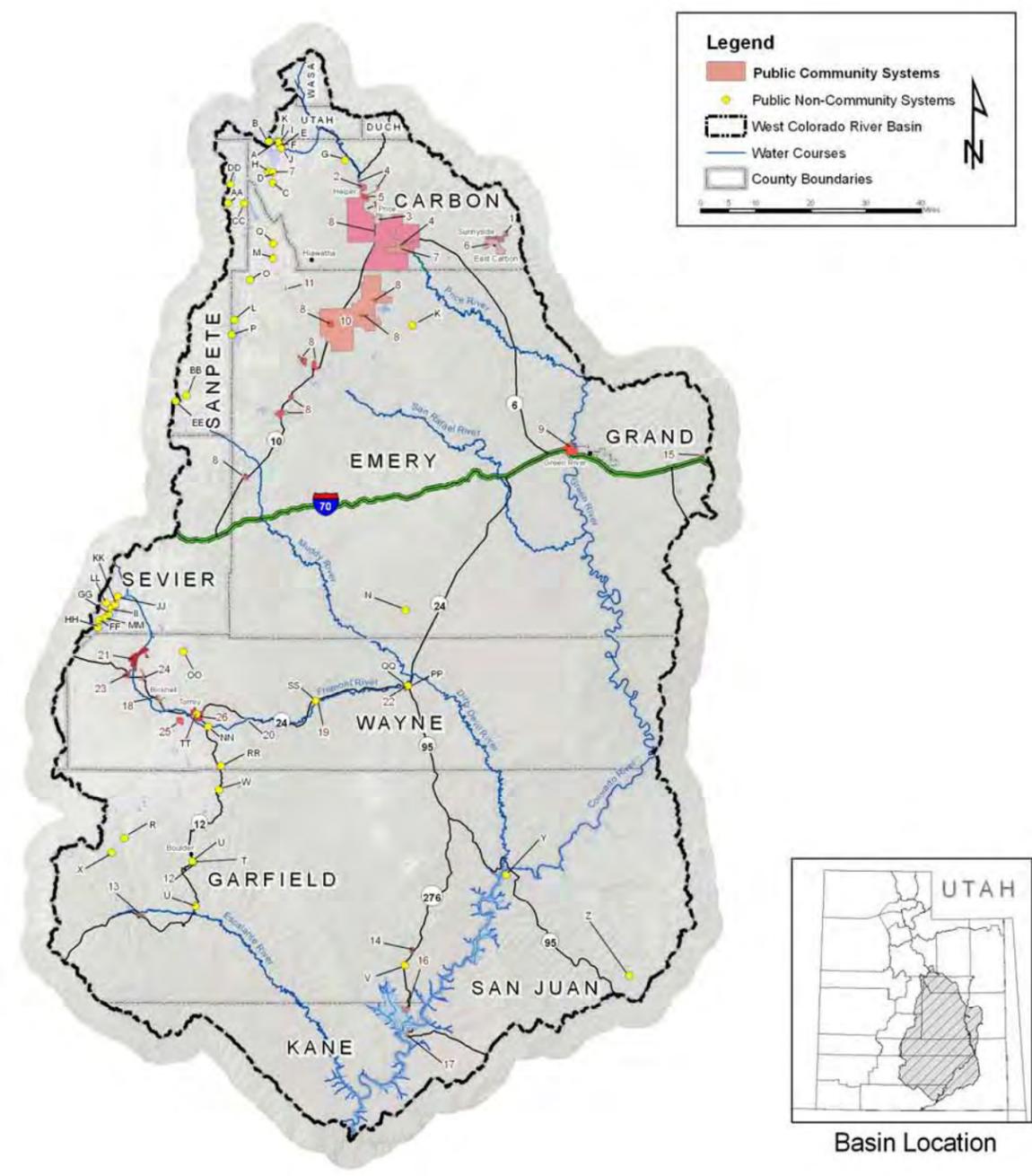


Figure 2. Location of Public Community Systems



## **WATER SUPPLY AND USE METHODOLOGY**

### **Background**

Over the past 45 years, the Utah Division of Water Resources (DWRe) has employed various procedures to obtain municipal and industrial water use (M&I) data. In recent years, these procedures have become more comprehensive. When the division began water planning in the 1960's, available data consisted mainly of supplies and uses for the state as a whole. At that time, Utah's agricultural water uses far exceeded M&I uses. M&I water use was calculated simply by multiplying estimated per capita water use rates by census population data.

By the early 1980's, M&I diversions made up a larger percent of all statewide water uses and the entire water community increased their focus on M&I water supplies and uses. The Utah Division of Water Rights (DWRi) launched a program to collect yearly, statewide M&I data from each public community water system. The procedure involved mailing a survey designed to query major public water suppliers about their sources of water supply. Additionally, the United States Geological Survey (USGS) began M&I water use studies. The DWRe relied on both data sources in its planning efforts by the late 1980's.

With the preparation of the State Water Plan Basin reports, and the increasing focus on water conservation, the DWRe saw the need to verify and improve the quality and quantity of the available data. The first method used included assisting the DWRi in the improvement of their M&I data collection program. Currently, the collection of water use data is a joint effort between all three divisions, administered by the DWRi. Additionally, the DWRe began verifying the accuracy of the data through yearly field surveys, as described in the following four sections.

## Data Collection Methodology for Community Water Systems

Each year, the DWRe targets several hydrologic basins for M&I water supply and use analysis. The most recent water use information supplied by the DWRi is the basis used to begin the study. Prior to 2003, this information was submitted using a standard form by each water supplier. An example of the 2003 water use data form for the Price River Water Improvement District Water System is found in **Appendix A**. Since 2003, the program has been updated, allowing for the water suppliers to electronically submit their data.

The DWRe staff contact the manager or operator of each community water system (as defined by the Utah Division of Drinking Water) to schedule a data collection and analysis meeting. These meetings are necessary because data often is not reported (either on the water use forms or electronically) in the detail required for a complete M&I water use study. During these meetings, staff clarifies and collects additional data as needed. Total water supply and usage of the water systems are calculated based on information gathered during these meetings. When data is not available, it is necessary to estimate a part or all of the system use.

A secondary objective of these meetings is to instruct the operator or manager on how to most accurately and effectively complete the water use data form and/or submit their information electronically. This methodology has been used since 1992.

### Water Supply

Two factors define the potable water supply: maximum water supply available under present conditions and reliable water supply. The maximum water supply available under present conditions is defined as the water resource that is presently developed. It is limited by a mechanical constraint (such as pump capacity or pipe size), a hydrologic constraint (such as reliable stream flow or groundwater safe yield) or a legal constraint (such as a water right or contract). **The lesser amount of water**

**supply, due to these three constraints, is considered to be the maximum water supply available under present conditions used in this analysis.**

Determining well pump capacities, average annual spring flow estimates, treatment plant capacities, and water right information aid in the calculation of maximum supply. It should be noted that, due to the complexity of water rights, contracts, exchanges, etc., a detailed search of water right limitations associated with each entity is not within the scope of this study.

The reliable potable water supply is defined as the capacity to meet peak day demands, expressed as an annual volume. It is valuable in determining future water supply capacities of the particular community water system sources (wells, springs, etc.). **The reliable potable water supply is calculated by adding together the maximum developed water supply capacity of surface sources, one-half of the maximum yield of wells or their pump capacities (unless otherwise indicated by the system manager), and a percentage of the average annual flow of spring sources.** The percentage of the spring source flows range between 50% and 100%. The determination of the percentage is based on information provided by the water supplier.

On page 11, **Figure 3** graphically presents the relationship between the maximum water supply and the reliable potable water supply of a system. By quantifying the maximum and the reliable potable water supply of a system, the population that a system can potentially support can be determined. The current total yearly water use is the volume under the lower curve (*Present Water Use Pattern*). The future total yearly water use is the volume under the upper curve (*Future Water Use Pattern*). This total is equivalent to the reliable potable water supply.

The maximum water supply under present conditions is the volume under the upper line (Maximum Water Supply) in **Figure 3**. This amount is a

theoretical annual volume based upon a maximum daily flow rate (limited by the water right or system capacity). Consequently, the peak day demand point on the future water use curve (*Future Peak Day Demand*) cannot exceed this upper limit. Due to the fluctuating nature of some sources (particularly springs), and the fact that most culinary water system storage tanks are designed to store only about one day of water demand, not all of the total maximum developed potable water supply is available to meet future water needs.

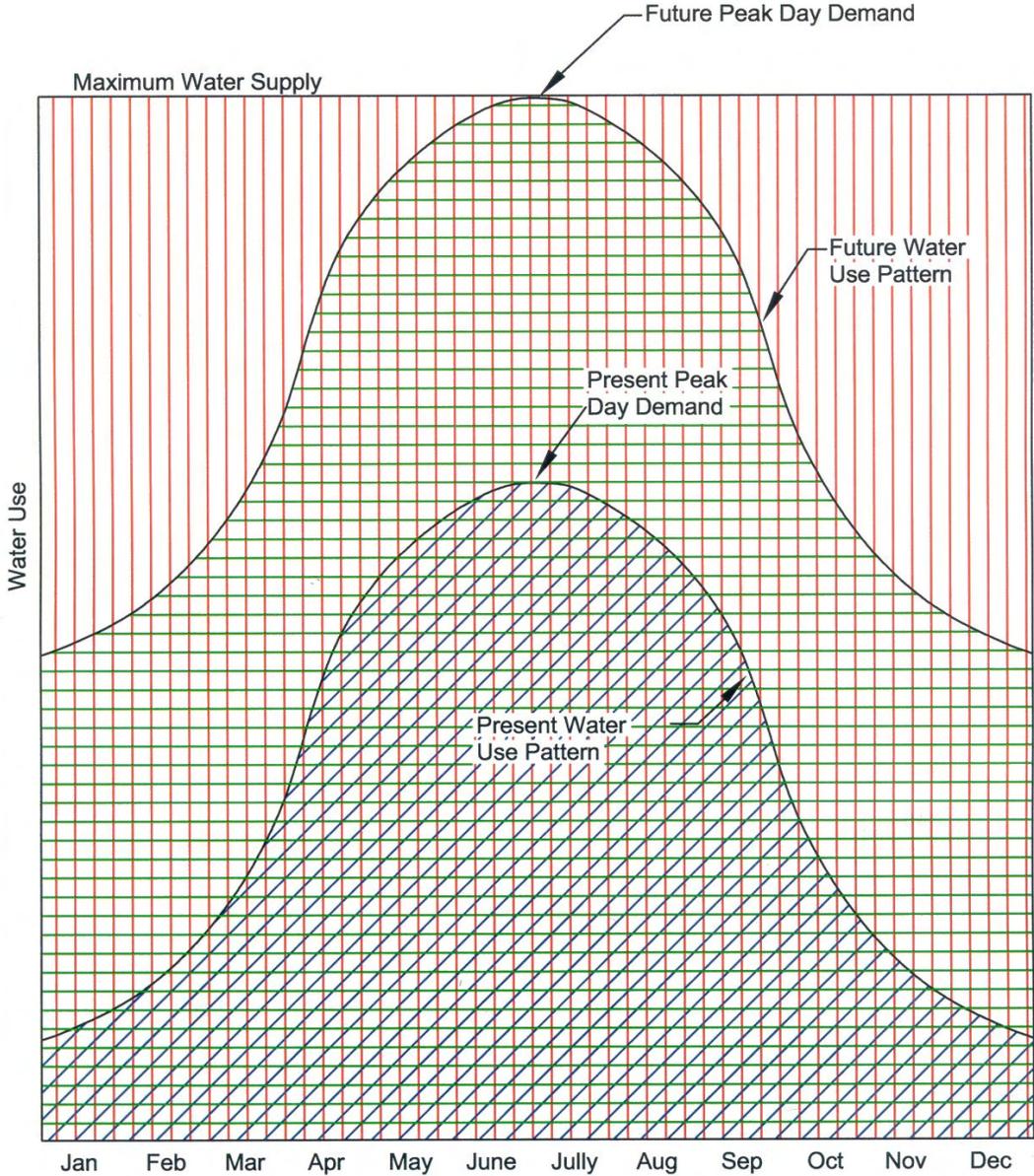
It is important to note that the reliable potable water supply is a theoretical annual volume based upon the current daily peak demand flow rate of any one system, under its current demand conditions. Additional supply may be made available by lowering and/or increasing the size of existing well pumps, pumping existing wells for longer durations, increasing storage capacity and/or distribution pipe sizes. However, being based only on current conditions, these systematic changes may cause operational problems during times of peak demand. Therefore, the DWRe uses the reliable potable water supply only as a reference tool to quantify the annual amount of water that can be delivered by each community water system.

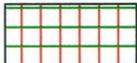
For planning purposes, the reliable potable water supply is essential for estimating what population base each system can theoretically support with current demand patterns. It is also a guideline to help predict the approximate timing of future system improvements in order to meet any increase in demand.

### *Secondary Water*

Deliveries of non-potable (secondary) water are an important component of the water use within the boundaries of public community water systems. However, quantifying the available supply of this water is difficult. In Utah, many of the secondary water systems are part of a larger agricultural irrigation system. Hence, the theoretical

Figure 3. Water Supply and Use Hydrograph



- 
 Present Yearly Water Use (Volume under curve)
- 
 Present Reliable Water Supply/Future Water Use (Volume under Curve)  
 When this volume is divided by annual per capita water use, this yields the population that can be reliably served.
- 
 Maximum Water Supply Available Under Present Conditions (Volume under line)

supply includes both agricultural and M&I water. Currently, separating M&I secondary from agricultural water is mostly estimated, due to the lack of and/or absence of metering, particularly at the level of individual property connections.

With secondary water use becoming more prevalent for outdoor landscaping, estimating the available supply of this water is becoming increasingly more important. **For planning purposes, the DWRe assumes that the supply for M&I secondary irrigation is simply equal to the current use.**

### Water Use

**Present water use, as defined herein, is the developed water supply that is actually delivered by the distribution system from surface or subsurface sources.** Water use is divided into four categories: residential, commercial, institutional and industrial.

#### *Residential*

The staff collects data about the number of residential connections and the amount of water used by those connections from a water system representative. Water use in this category is divided into three subcategories: culinary-outdoor, culinary-indoor, and secondary-outdoor. While most systems will meter the total culinary residential water use, indoor and outdoor use are rarely metered separately. Secondary water use is rarely metered. Therefore, the DWRe usually estimates these subcategory totals.

Typically, culinary indoor use will be estimated first. One method to estimate the indoor use is to review residential meter reading totals for the system from the winter months, if available. Since outdoor watering typically does not occur during the winter months, it can be assumed that the water used in winter months is for indoor use only. The winter water use is then used to determine the total yearly indoor use.

When the above method does not yield a reasonable value for indoor use, the indoor use per capita water use for a system can be estimated by using an equation that was developed in a detailed residential study, “Identifying Residential Water Use”, completed by the DWRe in 2001. The mathematical equation that was developed for per capita indoor water use is as follows:

$$\text{GPCD}_{\text{Indoor}} = 90.3 / P_{\text{PH}} + 42.3$$

Where:

$\text{GPCD}_{\text{Indoor}}$  = Gallons per Capita Day (per capita indoor water use)

$P_{\text{PH}}$  = Persons per Household (US Census Bureau)

The total yearly indoor water use is then calculated for the system by multiplying the result of the above equation by the current population. Outdoor culinary water use can then be estimated by subtracting the total yearly indoor water use from the given total residential culinary water use.

Because very few entities meter secondary outdoor water use, the DWRe staff estimates the outdoor secondary water use by using the average lot size, percent irrigated, percent of residences that are supplied by separate secondary (pressurized and ditch) irrigation systems, water right-duty rates (volume of water required for turf growth) in the area, and other related information for each system. In determining residential secondary use, care is taken to not include irrigation water use for small pastures or farm fields that can often be found adjacent to residences, particularly in rural communities.

### *Commercial*

For most systems, the system operator can separate metered commercial water use data from the total water use. In cases where this data is not available or is extremely difficult to obtain, the DWRe staff attempts to estimate commercial water use by inventorying commercial businesses in the area and using published commercial water use estimates. The Utah Division of Drinking Water and the Utah

State Water Lab, among others, publish these estimates. In some rural communities where there are a relatively small number of commercial connections, the businesses are visited individually by DWRe staff and asked about their water use.

Some commercial facilities use secondary water to irrigate outside landscapes. This is especially typical for commercial golf courses. As in these cases many times, secondary water is not metered. The DWRe staff estimates this use by multiplying the size of the irrigated area by a water right-duty rate or the evapotranspiration rate (ET). The ET indicates the amount of water, in inches, necessary for turf growth.

### *Institutional*

Institutional water use is water used for city, county, state and federal government facilities, parks, municipal golf courses, schools, hospitals, churches, military facilities, as well as fire hydrant testing and other municipal losses in the water system. Because this water use is often not metered, the process to acquire this data is difficult. Again, the system operator is asked to provide information about city facilities such as the number and size (irrigated acreage) of parks, schools, churches, and municipal golf courses. Water right-duty rates (and/or the ET) are used to calculate the amount of water used to irrigate these areas. Estimates of leakage and water use for testing of water system facilities and are also included in this category.

### *Industrial*

Industrial water use is defined as water used in the production of a product. Therefore, such commercial establishments as dairies, mink farms, and greenhouses, as well as stockwatering, are included in this category, provided a community water system serves them. Industrial water use within community water systems is acquired with the same process used to obtain commercial water use data discussed earlier.

### **Data Collection Methodology for Public Non-Community Water Systems**

The DWRe staff attempts to contact each non-community system and/or make a personal visit to these systems. Non-community systems rarely meter their water use, so the DWRe staff estimate the annual water use. Questions are asked to determine the types of facilities on the system, population served, water source information, irrigation of outside areas, etc. This data, along with information found in water-related publications, is used to determine water use. The maximum and reliable water supplies for these systems are relatively small, often not available and are therefore not included in this study. However, for planning purposes, the DWRe assumes that the water supply for these systems is equal to their water use.

### **Data Collection Methodology for Self-Supplied Industrial Water Systems**

Although self-supplied industries are included in the Non-Community Water Systems category as defined by the DDW, the DWRe has divided them into a separate category due to their importance. The category is equivalent to the DDW's Non-Community, Non-Transient category.

Water use is acquired for self-supplied industries by using data from the DWRI's Industrial Water Use Form and/or electronically submitted data. The DWRI collects annual water use data from most of the major self-supplied industrial water users in the state. This data is confidential. Therefore, the data presented in this M&I study is only presented as county totals. As with other non-community systems, the maximum and reliable water supplies are often not available and are not in the scope of this study. For planning purposes, the DWRe assumes that the water supply for these systems is equal to their water use.

## **Data Collection Methodology for Private Domestic Water Systems**

Private domestic systems are residences that are not connected to any public community or non-community water system. They are usually supplied by individual wells. To determine the water use data for this category, the population of those served by private domestic systems is estimated. This population is estimated by subtracting the population served by community water systems from the county population data acquired from the Governor's Office of Planning and Budget (GOPB). The remainder is assumed to be the population that is served by private domestic systems. The per capita water use rate for this category is assumed to be the same as the rate for the public community system residential category for that county. To determine the total water use by private domestic systems, the estimated population is then multiplied by this rate. Again, the maximum and reliable water supplies for private wells, being relatively small, are not in the scope of this study. Similarly, for planning purposes, the DWRe assumes that the water supply for these systems is equal to their water use.

## DEFINITIONS OF WATER TERMS

Water is supplied by a variety of systems for many types of users. The general term supply is defined as the amount of water available. Municipalities own most of the individual water supply systems. However, in some cases the owner or operator is a private company, state or federal agency. Thus, a "public" water supply may be either publicly or privately owned and supply treated and/or untreated water.

### **Water Supply Terms**

*Maximum Developed Potable Water Supply* - The annual volume of potable (culinary) water which is the lesser of the hydrologic capacity of the water source, the physical capacity of the water system, or the amount allowed by the collective water rights. (See pages 8-10 for a more detailed explanation)

*Reliable Potable Water Supply* - The annual volume within the maximum developed water supply that is available to meet peak demands. This is generally calculated as 100% of the maximum supply from surface water sources, 50% of the maximum yield of wells, and between 50% and 100% of the average annual spring flows. When this number is divided by the average per capita usage, the resulting number represents the theoretical maximum population that the water source can serve. (See pages 8-10 for a more detailed explanation)

*Municipal and Industrial Water Supply* - Includes all water (potable and non-potable) supplied for residential, commercial, institutional, light industry, and self-supplied industries. This supply is delivered by public community systems, public non-community (transient and non-transient) systems, self-supplied industrial systems, unregulated Indian water systems and private wells.

## **Types of Water**

*Potable Water* – Includes water meeting all applicable Federal, State, and Local drinking water requirements for residential, commercial, institutional and industrial uses. It is also referred to as culinary water supply.

*Secondary Water* – Includes water not meeting safe drinking water requirements. It is also referred to as non-potable (non-culinary) water. This water is usually delivered by pressurized or open ditch systems for irrigation of privately and publicly owned landscapes, gardens, parks, cemeteries, golf courses and other open areas. Sometimes called "dual" water systems, they are installed to provide an alternative to irrigating with culinary water for these outdoor areas. Although Irrigation companies most often provide this water, public community systems may deliver this water as well. Self-supplied industries can also use secondary water for industrial processes.

## **Water System Categories**

*Public Community Water System* - Provides potable and/or non-potable water by either a privately or publicly owned water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Water from the public community water supplies may be used in both indoor and outdoor applications for residential, commercial, institutional, and industrial purposes.

*Public Non-Community Water System* - Provides potable and/or non-potable water by either a privately or publicly owned water system of one of two types: transient and non-transient. Transient systems are systems that do not serve 25 of the same non-resident persons per day for more than six months per year. Examples include campgrounds, RV parks, restaurants, convenience stores, etc. Non-transient systems are systems that regularly serve 25 of the same non-resident persons per day for more than six months per year. Examples include churches, schools and

industries. This report categorizes industrial non-transient systems as self-supplied industries.

*Self-Supplied Industrial System* - Provides potable and/or non-potable water for use by individual privately owned industries (usually from their own wells or springs).

*Private Domestic System* – Provides potable and/or non-potable water from privately owned wells and/or springs for use by individual homes.

### **Water Use Terms**

Water is used in a variety of ways and for many purposes. It is often said that water is "used" when it is diverted, demanded, withdrawn, depleted or consumed. But it is also "used" in place for such things as fish and wildlife habitat, recreation and hydropower production. **Water use in this report is defined as “delivered” water.** A table that shows the basin’s M&I water deliveries and depletions is provided in **Appendix B.**

In the previous water supply section, the word “use” can be interchanged with the word “supply” to define the current demand associated with those definitions. Some additional water use terms are as follows:

*Commercial Use* - Use normally associated with small business operations that may include drinking water, food preparation, personal sanitation, facility cleaning and maintenance and irrigation of facility landscapes. Examples include retail businesses, restaurants and hotels.

*Industrial Use* - Use associated with the manufacturing or production of products. The volume of water used by industrial businesses can be considerably greater than water used by commercial businesses. Examples include manufacturing plants, oil and gas producers, mining companies, mink farms and dairies.

Institutional Use - Use normally associated with general operation of various public agencies and institutions (i.e. schools, municipal buildings, churches) including drinking water, personal sanitation, facility cleaning and maintenance and irrigation of parks, cemeteries, playgrounds, recreational areas, golf courses, and other facilities. The amount of water used by cities for outside irrigation of public areas typically is not metered.

Residential Use - Use associated with residential cooking, drinking water, washing clothes, miscellaneous cleaning, personal grooming and sanitation, irrigation of lawns, gardens and landscapes, and washing automobiles, driveways and other outside residential facilities. Examples include single-family homes, apartments, duplexes and condominiums.

### **Other Water Terms**

Consumption - Water evaporated, transpired or irreversibly bound in either a physical, chemical or biological process. Consumed water results in a loss of the original water supplied.

Consumptive Use - Losses of water brought about by human endeavors when used for residential, commercial, institutional, industrial, agricultural, power generation, and recreation. Naturally occurring vegetation, fish and wildlife also consumptively use water.

Deliveries - Water already within a system that is being provided to an individual connection, whether potable or non-potable and/or metered or not. The connection can be for residential, commercial, institutional, and/or industrial uses. **For the purpose of this report, the delivered water amount is equivalent to water use.**

Depletion - Water consumed and made unavailable for return to a given designated area, river system or basin. It is intended to represent the net loss to a system. The

terms consumption and depletion are often used interchangeably but are not the same. For example, water exported from a basin is depletion from the basin system but is not consumed in the basin. The exported water is available for use (consumption) in another basin or system. Water diverted to irrigate crops in a given system, but not returned for later use, is depletion. Precipitation that falls on irrigated crops is not considered a part of the supply like surface water and groundwater diversions. For this reason, precipitation falling on and consumed by irrigated crops is not considered as being depletion from the system.

*Diversion* - Water diverted from supply sources such as streams, lakes, reservoirs or groundwater for a variety of purposes, including cropland irrigation, as well as residential, commercial, institutional and industrial uses.

*Withdrawal* - Water withdrawn from supply sources such as lakes, streams, reservoirs or groundwater. This term is normally used in association with groundwater withdrawal. The terms *diversion* and *withdrawal* are often used interchangeably.



## **WATER RIGHTS IN THE WEST COLORADO RIVER BASIN**

Although a detailed analysis of water rights is not part of this report, a water supply and use study would not be complete without at least a discussion on the current water right regulations in the area. The following discussion was obtained from the DWRi. It explains the current general water right regulations in the Cedar/Beaver Basin with regards to M&I uses. For more details on these areas, please refer: <http://www.waterrights.utah.gov/wrinfo/policy/wrareas/default.asp>.

### **Carbon, Emery, Garfield, Grand, Kane, San Juan, Sevier and Utah Counties**

Surface water is fully appropriated. In areas outside of public system boundaries, groundwater applications are limited to indoor uses for one family with one acre of irrigation and 10 head of stock.

### **Wayne County**

Surface water is fully appropriated. In areas outside of public system boundaries, groundwater applications are limited to indoor uses for one family with 0.25 acres of irrigation and 10 head of stock.



## CARBON COUNTY M&I WATER SUPPLIES AND USES

Carbon County includes the incorporated communities of East Carbon, Helper, Price, Wellington, and Sunnyside. Within this area are 7 public community systems, 10 public non-community systems and 7 self-supplied industries. Price River Water Improvement District, (PRWID), has absorbed several of the water companies that were listed in earlier reports. PRWID now delivers water to retail customers and wholesales to Spring Glen and Wellington water companies as well as several (less than 25 connections per system) smaller unregulated (homeowner) systems. Price City delivers water to its own retail customers as well as wholesale deliveries to the unregulated River View Water Company. Locations of public community and non-community systems are shown in **Figure 3** on page 5.

As shown in the following **Table 1**, the maximum annual potable water supply for public community systems in this portion of Carbon County is 19,561 acre-feet; about 27% from springs, 22% acre-feet from wells and 51% from surface waters.

**TABLE 1  
CARBON COUNTY  
Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs (Ac-Ft/Yr)	Wells (Ac-Ft/Yr)	Surface (Ac-Ft/Yr)	Total (Ac-Ft/Yr)
East Carbon & Columbia Municipal	46.4	724.0	724.0	<b>1,494.4</b>
Helper Municipal Water System	629.9	1,990.9	117.0	<b>2,737.9</b>
Price Municipal Water System	4,608.3	0.0	1,112.0	<b>5,720.3</b>
Price River Water Improvement Dist.	0.0	0.0	1,440.4	<b>1,440.4</b>
Spring Glen Water Company	0.0	0.0	0.0	<b>0.0</b>
Wellington Cullinary Water	0.0	0.0	0.0	<b>0.0</b>
Sunnyside City Water	0.0	1,607.2	6,561.3	<b>8,168.5</b>
<b>CARBON COUNTY</b>	<b>5,284.7</b>	<b>4,322.1</b>	<b>9,954.7</b>	<b>19,561.5</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

The reliable potable water supply for public community systems in the Carbon County portion of the West Colorado River Basin is 14,758 acre-feet.

The reliable supply is 75% of the maximum supply. The breakdown of this supply is presented in **Table 2**.

**TABLE 2  
CARBON COUNTY  
Reliable Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

<b>WATER SUPPLIER</b>	<b>SPRINGS (Ac-Ft/Yr)</b>	<b>WELLS (Ac-Ft/Yr)</b>	<b>SURFACE (Ac-Ft/Yr)</b>	<b>TOTAL (Ac-Ft/Yr)</b>
East Carbon & Columbia Municipal	23.2	362.0	724.0	<b>1,109.2</b>
Helper Municipal Water System	315.0	995.5	117.0	<b>1,427.4</b>
Price Municipal Water System	2,304.2	0.0	1,112.0	<b>3,416.2</b>
Price River Water Improvement Dist.	0.0	0.0	1,440.4	<b>1,440.4</b>
Spring Glen Water Company	0.0	0.0	0.0	<b>0.0</b>
Wellington Cullinary Water	0.0	0.0	0.0	<b>0.0</b>
Sunnyside City Water	0.0	803.6	6,561.3	<b>7,364.9</b>
<b>CARBON COUNTY TOTALS</b>	<b>2,642.4</b>	<b>2,161.0</b>	<b>9,954.7</b>	<b>14,758.1</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 3** shows the breakdown of potable water use for each public community system. This table indicates that for Carbon County, the current annual use of 4,423 acre-feet of water (within the public community systems) is about 30% of the reliable supply.

**TABLE 3  
CARBON COUNTY  
Water Use for Public Community Systems**

<b>CARBON COUNTY WATER SUPPLIER</b>	<b>POTABLE USAGE (Ac-Ft/Yr)</b>						<b>Service Population</b>	<b>Gallons Per Capita Per Day</b>
	<b>Residential Indoor</b>	<b>Residential Outdoor</b>	<b>Commercial Total</b>	<b>Institutional Total</b>	<b>Industrial Total</b>	<b>Total M&amp;I</b>		
East Carbon & Columbia Municipal	118.6	299.7	0.2	0.0	47.6	466.1	1,270	327.6
Helper Municipal Water System	159.2	69.8	42.0	18.0	1.0	290.0	1,650	156.9
Price Municipal Water System	578.3	669.0	240.9	547.2	22.7	2,058.1	7,330	250.7
Price River Water Improvement Dist.	521.0	632.3	53.5	0.0	0.0	1,206.7	6,170	174.6
Spring Glen Water Company	63.3	0.0	0.0	0.0	0.0	63.3	750	75.4
Wellington Cullinary Water	139.9	0.0	26.6	15.6	4.8	186.9	1,550	107.6
Sunnyside City Water	35.9	100.8	0.7	1.7	13.0	152.0	370	366.7
<b>CARBON COUNTY TOTALS</b>	<b>1,616.1</b>	<b>1,771.6</b>	<b>363.8</b>	<b>582.5</b>	<b>89.1</b>	<b>4,423.1</b>	<b>19,090</b>	<b>206.8</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F and H

G=B+C+D+E+F

I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.

Potable M&I Water Use.

Average gallons per capita per day potable water use.

**Table 4**, below, presents the annual amount of secondary water used for various categories within the boundaries of the public community systems. In Carbon County, separate irrigation companies deliver secondary water to customers outside of the Price River Water Improvement District. Total secondary water use is estimated to be 1,672 acre-feet.

**TABLE 4  
CARBON COUNTY  
Secondary (Non-Potable) Water Use Within Public Community Systems  
(Acre-Feet/Year)**

<b>WATER SUPPLIER</b>	<b>Residential Use (Ac-Ft/Yr)</b>	<b>Commercial Use (Ac-Ft/Yr)</b>	<b>Institutional Use (Ac-Ft/Yr)</b>	<b>Industrial/ Stockwater Use (Ac-Ft/Yr)</b>	<b>Total Secondary Use (Ac-Ft/Yr)</b>
East Carbon & Columbia Municipal	0.0	0.0	0.0	0.0	<b>0.0</b>
Helper Municipal Water System	119.0	0.0	60.4	0.0	<b>179.4</b>
Price Municipal Water System	0.0	0.0	0.0	0.0	<b>0.0</b>
Price River Water Improvement Dist.	715.0	0.0	350.0	0.0	<b>1,065.0</b>
Spring Glen Water Company	137.7	0.0	0.0	0.0	<b>137.7</b>
Wellington Cullinary Water	290.0	0.0	0.0	0.0	<b>290.0</b>
Sunnyside City Water	0.0	0.0	0.0	0.0	<b>0.0</b>
<b>CARBON COUNTY TOTALS</b>	<b>1,261.7</b>	<b>0.0</b>	<b>410.4</b>	<b>0.0</b>	<b>1,672.1</b>

Note: Separate irrigation companies provide secondary water to the water supplier unless indicated by an \*\*\*.

**Table 5**, below, presents various per capita rates for the public community systems in the Carbon County portion of the West Colorado River Basin.

**TABLE 5  
CARBON COUNTY  
Average GPCD Water Use  
for Public Community Systems**

<b>Water Supplier</b>	<b>Service Population</b>	<b>Residential Water Use</b>			<b>CII Water Use*</b>			<b>TOTAL WATER USE</b>		
		<b>Potable</b>	<b>Non-Potable</b>	<b>Sub Total</b>	<b>Potable</b>	<b>Non-Potable</b>	<b>Sub Total</b>	<b>Potable</b>	<b>Non-Potable</b>	<b>TOTAL</b>
East Carbon & Columbia Municipal	1,270	294	0	<b>294</b>	34	0	<b>34</b>	328	0	<b>328</b>
Helper Municipal Water System	1650	124	64	<b>188</b>	33	33	<b>66</b>	157	97	<b>254</b>
Price Municipal Water System	7,330	152	0	<b>152</b>	99	0	<b>99</b>	251	0	<b>251</b>
Price River Water Improvement Dist.	6,170	167	103	<b>270</b>	8	51	<b>58</b>	175	154	<b>329</b>
Spring Glen Water Company	750	75	164	<b>239</b>	0	0	<b>0</b>	75	164	<b>239</b>
Wellington Cullinary Water	1,550	81	167	<b>248</b>	27	0	<b>27</b>	108	167	<b>275</b>
Sunnyside City Water	370	330	0	<b>330</b>	37	0	<b>37</b>	367	0	<b>367</b>
<b>CARBON COUNTY TOTALS</b>	<b>19,090</b>	<b>158</b>	<b>59</b>	<b>217</b>	<b>48</b>	<b>19</b>	<b>68</b>	<b>207</b>	<b>78</b>	<b>285</b>

\*Commercial, Institutional, and Industrial

The following, **Table 6**, indicates water use for public non-community, self-supplied industries and private domestic systems in this portion of the West Colorado River Basin. There are 7 self-supplied industries including two coal-fired electric power plants (these alone use 51 acre-feet of potable water and 3,838 acre-feet of secondary water) and a number of private domestic wells. All of these uses amount to about 113 acre-feet of potable water and 3,838 acre-feet of secondary water.

**TABLE 6  
CARBON COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Domestic Systems  
(Acre-Feet/Year)**

CARBON COUNTY WATER SUPPLIER	POTABLE USAGE					Total Potable Use	Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial			
<b>Non-Communities</b>							
State Park Systems							
Scofield State Park - Mountain View	0.0	0.0	3.5	0.0	3.5	0.0	
Scofield State Park - Madsen Bay	0.0	0.0	1.4	0.0	1.4	0.0	
Aspen Cove	10.1	0.0	0.0	0.0	10.1	0.0	
Aspen View - Scofield Mountain Homes	2.7	0.0	0.0	0.0	2.7	0.0	
Clear Creek Camp - Alpine	0.2	0.0	7.7	0.0	7.9	0.0	
Clear Creek Utilities, inc.	4.7	0.0	0.0	0.0	4.7	0.0	
Price Canyon Recreation Area	0.0	0.0	0.0	0.0	0.0	0.0	
Scofield	5.1	0.1	0.0	0.0	5.2	0.0	
Scofield Frontier Camp	0.0	0.0	0.9	0.0	0.9	0.0	
Scofield Reservoir Camp Site	1.2	0.0	0.0	0.0	1.2	0.0	
<b>Total Non-Community Use</b>	<b>24.1</b>	<b>0.1</b>	<b>13.6</b>	<b>0.0</b>	<b>37.8</b>	<b>0.0</b>	
<b>Self Supplied Industries*</b>	0.0	0.0	0.0	51.4	51.4	3,838.5	
<b>Private Domestic</b>	24.0	0.0	0.0	0.0	24.0	0.0	
<b>CARBON COUNTY TOTALS</b>	<b>48.1</b>	<b>0.1</b>	<b>13.6</b>	<b>51.4</b>	<b>113.2</b>	<b>3,838.5</b>	

\* Self Supplied Industries: Canyon Fuel Co. LLC, Cyprus Plateau Mining, ECDC Environmental, Hiawatha Coal, Sunnyside Co-generation Assoc., Sweet Family Partnership and Utah Power (Carbon)

Collectively, the total potable M&I water use from all systems in the Carbon County portion of the West Colorado River Basin is about 4,536 acre-feet, while secondary use is 5,511 acre-feet; giving a total M&I water use of 10,047 acre-feet.

## EMERY COUNTY M&I WATER SUPPLIES AND USES

The Emery County portion of the West Colorado River Basin includes the incorporated communities of Castledale, Cleveland, Elmo, Emery, Ferron, Huntington and Orangeville. Within this portion of the basin, there are 4 public community systems, 7 public non-community systems and 5 self-supplied industries. Castle Valley Special Service District receives water from Emery County Water Conservancy District and wholesales it to the towns of Clawson, Cleveland, Elmo, Emery, Ferron, Huntington and Orangeville. The locations of public community and non-community systems are shown back in **Figure 3** on page 5.

**Table 7** shows that the maximum annual water supply for public community systems in this portion Emery County is 10,942 acre-feet: about 1% from springs, 7% from wells and 92% from surface waters.

**TABLE 7  
EMERY COUNTY  
Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
Castle Valley SSD <sup>1</sup>	130.6	724.0	1,350.7	<b>2,205.3</b>
Green River Municipal Water	0.0	0.0	6,121.9	<b>6,121.9</b>
North Emery Water Users SSD	0.0	0.0	2,600.0	<b>2,600.0</b>
Trail Canyon Residential System	15.0	0.0	0.0	<b>15.0</b>
<b>EMERY COUNTY</b>	<b>145.6</b>	<b>724.0</b>	<b>10,072.6</b>	<b>10,942.2</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

<sup>1</sup> Castle Valley SSD includes the systems of Castledale, Cleveland, Elmo, Emery, Ferron, Huntington and Orangeville

The reliable potable water supply for public community systems in the Emery County portion of the West Colorado River Basin is 10,507 acre-feet. The reliable supply is 96% of the maximum supply. A breakdown of this supply is presented in **Table 8** on the following page.

**TABLE 8  
EMERY COUNTY  
Reliable Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total*
Castle Valley SSD	65.3	362.0	1,350.7	1,778.0
Green River Municipal Water	0.0	0.0	6,121.9	6,121.9
North Emery Water Users SSD	0.0	0.0	2,600.0	2,600.0
Trail Canyon Residential System	7.5	0.0	0.0	7.5
<b>EMERY COUNTY TOTALS</b>	<b>72.8</b>	<b>362.0</b>	<b>10,072.6</b>	<b>10,507.4</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 9** shows the breakdown of potable water use for each public community system. This table indicates that for Emery County, the current annual use of 1,909 acre-feet of water (within the public community systems) is about 18% of the reliable supply.

**TABLE 9  
EMERY COUNTY  
Water Use for Public Community Systems**

EMERY COUNTY  WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
Castle Valley SSD	653.3	704.1	29.2	32.5	38.7	1,457.8	7,880	165
Green River Municipal Water	70.5	12.6	141.4	8.0	3.2	235.7	970	217
North Emery Water Users SSD	126.0	70.0	9.2	0.5	1.9	207.7	1,560	119
Trail Canyon Residential System	2.6	5.5	0.0	0.0	0.0	8.1	40	181
<b>EMERY COUNTY TOTALS</b>	<b>852.4</b>	<b>792.3</b>	<b>179.8</b>	<b>41.0</b>	<b>43.8</b>	<b>1,909.2</b>	<b>10,450</b>	<b>163</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H, and K  
G=B+C+D+E+F  
I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.  
Potable M&I Water Use.  
Average gallons per capita per day potable water use.

**Table 10**, on the following page, presents the amount of secondary water used in the Emery County portion of the West Colorado River Basin. Total secondary water use by public community systems in this portion of the basin is 1,100 acre-feet.

**TABLE 10**  
**EMERY COUNTY**  
**Secondary (Non-Potable) Water Use Within Public Community Systems**  
**(Acre-Feet/Year)**

WATER SUPPLIER	Residential Use	Commercial Use	Institutional Use	Industrial/ Stockwater Use	Total Secondary Use
Castle Valley SSD*	382.2	0.0	500.0	0.0	882.2
Green River Municipal Water	0.0	0.0	0.0	0.0	0.0
Green River Canal Company	63.8	0.0	18.2	0.0	82.0
North Emery Water Users SSD	0.0	0.0	0.0	0.0	0.0
Huntington Cleaveland Irrigation Co.	135.6	0.0	0.0	0.0	135.6
Trail Canyon Residential System	0.0	0.0	0.0	0.0	0.0
<b>EMERY COUNTY TOTALS</b>	<b>581.6</b>	<b>0.0</b>	<b>518.2</b>	<b>0.0</b>	<b>1,099.8</b>

Note: Separate irrigation companies provide secondary water to the water supplier unless indicated by an "\*".

**Table 11** presents various per capita rates for the public community systems in the Emery County portion of the West Colorado River Basin.

**TABLE 11**  
**EMERY COUNTY**  
**Average GPCD Water Use**  
**For Public Community Systems**

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Castle Valley SSD	7,880	154	43	197	11	57	68	165	100	265
Green River Municipal Water	970	76	59	135	140	17	157	217	75	292
North Emery Water Users SSD	1,560	112	78	190	7	0	7	119	78	196
Trail Canyon Residential System	40	181	0	181	0	0	0	181	0	181
<b>EMERY COUNTY TOTALS</b>	<b>10,450</b>	<b>141</b>	<b>50</b>	<b>190</b>	<b>23</b>	<b>44</b>	<b>67</b>	<b>163</b>	<b>94</b>	<b>257</b>

\*Commercial, Institutional, and Industrial

The following **Table 12** indicates annual water use for public non-community, self-supplied industries and private domestic systems in this portion of the West Colorado River Basin. There are 5 self-supplied industries including two coal-fired electric power plants. Self-supplied industries use 385 acre-feet of potable water and 28,557 acre-feet of secondary water, the largest quantities of M&I water used in Emery County. All of these uses amount to about 411 acre-feet of potable water and 28,557 acre-feet of secondary water.

**TABLE 12  
EMERY COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Private Domestic Systems  
(Acre-Feet/Year)**

Non-Community System	POTABLE USAGE (Ac-Ft/Yr)					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
<b>Forest Service Systems</b>						
Forks of Huntington Campground	0.0	0.0	0.1	0.0	0.1	0.0
Indian Creek Campground	0.0	0.0	0.2	0.0	0.2	0.0
Joes Valley Campground	0.0	0.0	1.2	0.0	1.2	0.0
Old Folks Flat Campground	0.0	0.0	0.3	0.0	0.3	0.0
<b>BLM Systems</b>						
Cleveland Lloyd Dinosaur Quarry	0.0	0.0	0.3	0.0	0.3	0.0
<b>State Park Systems</b>						
Goblin Valley State Park	0.4	0.0	13.6	0.0	14.0	0.0
Filmore (Joes Valley) Subdivision	4.9	0.0	0.0	0.0	4.9	0.0
<b>Total Non-Community Use</b>	<b>5.3</b>	<b>0.0</b>	<b>15.7</b>	<b>0.0</b>	<b>20.9</b>	<b>0.0</b>
SELF SUPPLIED INDUSTRIES*	0.0	0.0	0.0	385.3	385.3	28,556.8
PRIVATE DOMESTIC SYSTEMS	5.0	0.0	0.0	0.0	5.0	0.0
<b>EMERY COUNTY</b>	<b>10.3</b>	<b>0.0</b>	<b>15.7</b>	<b>385.3</b>	<b>411.2</b>	<b>28,556.8</b>

\* Self Supplied Industries: Co-Op Mining Co., Consolidation Coal Company, Glenwal Resources Inc., Energy West, Utah Power & Light

The total potable M&I water use from all systems in this portion of the West Colorado River Basin is about 2,320 acre-feet, while secondary use is 29,657 acre-feet; giving a total M&I water use of 31,977 acre-feet.

## GARFIELD COUNTY M&I WATER SUPPLIES AND USES

The Garfield County portion of the West Colorado River Basin includes the incorporated communities of Boulder, Escalante and Ticaboo. Within this area, there are 3 public community systems, 7 public non-community systems, and 1 self-supplied industry. Locations of the public community and non-community systems are shown in **Figure 3** on page 5.

**Table 13**, below, shows that the maximum annual water supply for public community systems in this portion of the West Colorado River Basin is 2,147 acre-feet; about 22% from springs and 78% from wells.

**TABLE 13  
GARFIELD COUNTY  
Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
Boulder Farmstead Water Company	100.6	0.0	0.0	<b>100.6</b>
Escalante Culinary Water	362.0	598.7	0.0	<b>960.7</b>
Ticaboo SSD#1	0.0	1,086.0	0.0	<b>1,086.0</b>
<b>GARFIELD COUNTY TOTALS</b>	<b>462.5</b>	<b>1,684.7</b>	<b>0.0</b>	<b>2,147.2</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

The reliable potable water supply for public community systems in the Garfield County portion of the West Colorado River Basin is 1,074 acre-feet. The reliable supply is about 50% of the maximum supply. A breakdown of this supply is presented in **Table 14** on the following page.

**TABLE 14  
GARFIELD COUNTY  
Reliable Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	SPRINGS	WELLS	SURFACE	TOTAL
Boulder Farmstead Water Company	50.3	0.0	0.0	50.3
Escalante Culinary Water	181.0	299.4	0.0	480.4
Ticaboo SSD#1	0.0	543.0	0.0	543.0
<b>GARFIELD COUNTY TOTALS</b>	<b>231.3</b>	<b>842.3</b>	<b>0.0</b>	<b>1,073.6</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 15**, presents the breakdown of the potable water use for each public community system in the Garfield County portion of the West Colorado River Basin. This table indicates that the current annual potable use of 254 acre-feet of water is about 24% of the reliable potable water supply.

**TABLE 15  
GARFIELD COUNTY  
Water Use for Public Community Systems**

WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
Boulder Farmstead Water Company	8.8	25.6	4.5	1.6	0.5	41.0	90	407
Escalante Culinary Water	74.8	30.5	30.0	20.5	5.3	161.1	830	173
Ticaboo SSD#1	3.5	8.8	39.1	0.0	0.0	51.4	40	1,147
<b>GARFIELD COUNTY TOTALS</b>	<b>87.1</b>	<b>64.9</b>	<b>73.6</b>	<b>22.1</b>	<b>5.8</b>	<b>253.5</b>	<b>960</b>	<b>236</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H  
G=B+C+D+E+F  
I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.  
Potable M&I Water Use.  
Average gallons per capita per day potable water use.

**Table 16** on the following page presents the amount of secondary water used by the public community systems in this portion of the basin. Total secondary use this area of the basin is about 256 acre-feet.

**TABLE 16  
GARFIELD COUNTY  
Secondary (Non-Potable) Water Use Within Public Community Systems  
(Acre-Feet/Year)**

<b>WATER SUPPLIER</b>	<b>Residential Use</b>	<b>Commercial Use</b>	<b>Institutional Use</b>	<b>Industrial/ Stockwater Use</b>	<b>Public Total Secondary Use</b>
Boulder Farmstead Water Company	0.0	0.0	0.0	0.0	<b>0.0</b>
Boulder Irrigation Company	5.6	0.0	0.0	0.0	<b>5.6</b>
Escalante Culinary Water	0.0	0.0	0.0	0.0	<b>0.0</b>
Escalante Irrigation Company	250.0	0.0	0.0	0.0	<b>250.0</b>
Ticaboo SSD#1	0.0	0.0	0.0	0.0	<b>0.0</b>
<b>GARFIELD COUNTY TOTALS</b>	<b>255.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>255.6</b>

Note: Separate irrigation companies provide secondary water to the water supplier unless indicated by an "\*\*".

Various per capita rates for public community systems in the Garfield County portion of the West Colorado River Basin are given in **Table 17**.

**TABLE 17  
GARFIELD COUNTY  
Average GPCD Water Use  
For Public Community Systems**

<b>Water Supplier</b>	<b>Service Population</b>	<b>Residential Water Use</b>			<b>CII Water Use*</b>			<b>TOTAL WATER USE</b>		
		<b>Potable</b>	<b>Non-Potable</b>	<b>Sub Total</b>	<b>Potable</b>	<b>Non-Potable</b>	<b>Sub Total</b>	<b>Potable</b>	<b>Non-Potable</b>	<b>TOTAL</b>
Boulder Farmstead Water Company	150	205	33	<b>238</b>	39	0	<b>39</b>	244	33	<b>277</b>
Escalante Culinary Water	950	99	235	<b>334</b>	52	0	<b>52</b>	151	235	<b>386</b>
Ticaboo SSD#1	30	365	0	<b>365</b>	1,164	0	<b>1,164</b>	1,529	0	<b>1,529</b>
<b>GARFIELD COUNTY TOTALS</b>	<b>1,130</b>	<b>141</b>	<b>238</b>	<b>379</b>	<b>94</b>	<b>0</b>	<b>94</b>	<b>236</b>	<b>238</b>	<b>473</b>

\*Commercial, Institutional, and Industrial

**Table 18**, on the following page, indicates annual water use for public non-community systems, self-supplied industries, and private domestic systems in this portion of the West Colorado River Basin. The Grand Staircase-Escalante National Monument is among the 4 listed non-community systems. Plateau Resources is the only listed self-supplied industry. There are only a few residences using their own wells. All of these uses amount to about 30 acre-feet of potable water.

**TABLE 18  
GARFIELD COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Private Domestic Systems  
(Acre-Feet/Year)**

GARFIELD COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
<b>Non-Communities</b>						
BLM Systems						
Grand Staircase N.M. - Calf Creek CG	0.0	0.0	0.1	0.0	0.1	0.0
Forest Service Systems						
Blue Spruce Camp Ground	0.0	0.0	0.0	0.0	0.0	0.0
Pleasant Creek Campground	0.0	0.0	0.1	0.0	0.1	0.0
Posey Lake Campground	0.0	0.0	0.0	0.0	0.0	0.0
Lake Powel Management	0.0	0.0	0.5	0.0	0.5	0.0
Boulder Mountain Lodge	0.0	0.0	4.1	0.0	4.1	0.0
Boulder School	0.0	0.0	4.8	0.0	4.8	0.0
<b>Total Non-Community Use</b>	<b>0.0</b>	<b>0.0</b>	<b>9.6</b>	<b>0.0</b>	<b>9.6</b>	<b>0.0</b>
<b>Self Supplied Industries*</b>	0.0	0.0	0.0	10.1	10.1	0.0
<b>Private Domestic</b>	10.0	0.0	0.0	0.0	10.0	0.0
<b>GARFIELD COUNTY TOTALS</b>	<b>10.0</b>	<b>0.0</b>	<b>9.6</b>	<b>10.1</b>	<b>29.7</b>	<b>0.0</b>

\* Plateau Resources LTD.

Collectively, the total potable M&I water diversion of all systems in this portion of the West Colorado River Basin is 283 acre-feet, while secondary diversions are 256 acre-feet; giving a total M&I water diversion of 539 acre-feet.

## GRAND COUNTY M&I WATER SUPPLIES AND USES

The Grand County portion of the West Colorado River Basin includes the incorporated community of Thompson and one other public community system. The location of these systems is shown in **Figure 3** on page 5. There are no public non-community systems in the Grand County portion of the West Colorado River Basin.

As shown in **Table 19**, the maximum annual water supply for public community systems in Grand County is 724 acre-feet.

TABLE 19  
GRAND COUNTY  
**Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
Thompson Water Improvement Dist.	724.0	0.0	0.0	<b>724.0</b>
<b>GRAND COUNTY</b>	<b>724.0</b>	<b>0.0</b>	<b>0.0</b>	<b>724.0</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

The reliable potable water supply for public community systems in the Grand County portion of the West Colorado River Basin is 362 acre-feet. The reliable supply is about 50% of the maximum supply. The breakdown of this supply is presented in **Table 20** on the following page.

**TABLE 20  
GRAND COUNTY  
Reliable Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	SPRINGS	WELLS	SURFACE	TOTAL
Thompson Water Improvement Dist.	362.0	0.0	0.0	362.0
<b>GRAND COUNTY TOTALS</b>	<b>362.0</b>	<b>0.0</b>	<b>0.0</b>	<b>362.0</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 21**, presents the breakdown of the potable water use for each public community system. This table indicates that the current annual potable use of 31 acre-feet of water (within the public community system) is about 9% of the reliable potable water supply in this portion of Grand County.

**TABLE 21  
GRAND COUNTY  
Water Use for Public Community Systems**

GRAND COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
Thompson Water Improvement Dist.	7.0	6.5	5.5	11.9	0.0	30.9	80	344
<b>GRAND COUNTY TOTALS</b>	<b>7.0</b>	<b>6.5</b>	<b>5.5</b>	<b>11.9</b>	<b>0.0</b>	<b>30.9</b>	<b>80</b>	<b>344</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H  
G=B+C+D+E+F  
I=G\*(325851 gallons per acre-foot)/(365 days per year)/H

Input data.  
Potable M&I Water Use.  
Average gallons per capita per day potable water use.

There is no secondary, self-supplied industry or private domestic use in this small portion of Grand County.

Below in **Table 22** is presented the per capita rate for the public community system in the Grand County portion of the West Colorado River Basin.

**TABLE 22  
GRAND COUNTY  
Average GPCD Water Use  
For Public Community Systems**

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Thompson Water Improvement Dist.	80	151	0	151	17	0	17	168	0	168
<b>GRAND COUNTY TOTALS</b>	<b>80</b>	<b>151</b>	<b>0</b>	<b>151</b>	<b>194</b>	<b>0</b>	<b>194</b>	<b>344</b>	<b>0</b>	<b>344</b>

\*Commercial, Institutional, and Industrial

Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is 31 acre-feet. There are no deliveries of secondary/non-potable water for M&I use in this portion of the West Colorado River Basin.



## KANE COUNTY M&I WATER SUPPLIES AND USES

The Kane County portion of the West Colorado River Basin includes no incorporated communities. Within this area, there is 1 public community system on Lake Powell operated within the Glen Canyon National Recreation Area and no public non-community systems. The locations of public community and non-community systems are shown in **Figure 3** on page 5.

As shown in **Table 23**, the maximum annual water supply for public community systems in the Kane County portion of the West Colorado River Basin is 242 acre-feet.

**TABLE 23  
KANE COUNTY  
Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
National Park Service				
Bullfrog Rec. Site	0.0	241.8	0.0	<b>241.8</b>
<b>KANE COUNTY</b>	<b>0.0</b>	<b>241.8</b>	<b>0.0</b>	<b>241.8</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

The reliable potable water supply for public community systems in the Kane County portion of the West Colorado River Basin is 121 acre-feet. The reliable supply is about 50% of the maximum supply. The breakdown of this supply is presented in **Table 24** on the following page.

**TABLE 24  
KANE COUNTY  
Reliable Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	SPRINGS	WELLS	SURFACE	TOTAL
National Park Service				
Bullfrog Rec. Site	0.0	120.9	0.0	120.9
<b>KANE COUNTY TOTALS</b>	<b>0.0</b>	<b>120.9</b>	<b>0.0</b>	<b>120.9</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 25**, presents the breakdown of the potable water use for the public community system. This table indicates that for Kane County, the current annual is 256 acre-feet.

**TABLE 25  
KANE COUNTY  
Water Use for Public Community Systems**

BEAVER COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
National Park Service								
Bullfrog Rec. Site	43.6	22.8	189.1	0.0	0.0	255.5	490	466
<b>KANE COUNTY TOTALS</b>	<b>43.6</b>	<b>22.8</b>	<b>189.1</b>	<b>0.0</b>	<b>0.0</b>	<b>255.5</b>	<b>490</b>	<b>466</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H  
 G=B+C+D+E+F  
 I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.  
 Potable M&I Water Use.  
 Average gallons per capita per day potable water use.

There is no secondary, self-supplied industry or private domestic use in this portion of Kane County.

**Table 26** on the following page gives the per capita rate for this public community system in the West Colorado River Basin.

**TABLE 26  
KANE COUNTY  
Average GPCD Water Use  
For Public Community Systems**

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
National Park Service										
Bullfrog Rec. Site	490	121	0	121	344	0	344	466	0	466
<b>KANE COUNTY TOTALS</b>	<b>490</b>	<b>121</b>	<b>0</b>	<b>121</b>	<b>344</b>	<b>0</b>	<b>344</b>	<b>466</b>	<b>0</b>	<b>466</b>

\*Commercial, Institutional, and Industrial

There are no private domestic systems or non-community systems in the Kane County portion of the West Colorado River Basin. Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is 256 acre-feet. There are no deliveries of secondary/non-potable water for M&I use in this portion of the West Colorado River Basin.



## SAN JUAN COUNTY M&I WATER SUPPLIES AND USES

The San Juan County portion of the West Colorado River Basin has no incorporated communities. Halls Crossing Marina on Lake Powell operated within the Glen Canyon National Recreation Area, is the only public community system. Within this area, there is 1 public community system and 2 public non-community systems. Locations of the public community and non-community systems are shown in **Figure 3** on page 5.

As shown in the following **Table 27**, the maximum annual potable water supply for public community systems in this portion of San Juan County is 211 acre-feet; all from wells.

TABLE 27  
SAN JUAN COUNTY  
**Maximum Potable Water Supplies for Public Community Systems  
(Acre-Feet/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
National Park Service				
Halls Crossing Marina	0.0	211.4	0.0	<b>211.4</b>
<b>SAN JUAN COUNTY</b>	<b>0.0</b>	<b>211.4</b>	<b>0.0</b>	<b>211.4</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

The reliable potable water supply for public community systems in the San Juan County portion of the West Colorado River Basin is 106 acre-feet. The reliable supply is about 50% of the maximum supply. The breakdown of this supply is presented in **Table 28** on the following page.

**TABLE 28**  
**SAN JUAN COUNTY**  
**Reliable Potable Water Supplies for Public Community Systems**  
**(Acre-Feet/Year)**

WATER SUPPLIER	SPRINGS	WELLS	SURFACE	TOTAL
National Park Service				
Halls Crossing Marina	0.0	105.7	0.0	105.7
<b>SAN JUAN COUNTY TOTALS</b>	<b>0.0</b>	<b>105.7</b>	<b>0.0</b>	<b>105.7</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 29**, below, presents the breakdown of the potable water use for each public community system. This table indicates that for this portion of San Juan County, the current annual use of 65 acre-feet of water (within the public community systems), is about 64% of the reliable supply.

**TABLE 29**  
**SAN JUAN COUNTY**  
**Water Use for Public Community Systems**

WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
National Park Service								
Halls Crossing Marina	22.2	32.9	9.7	0.0	0.0	64.9	330	176
<b>SAN JUAN COUNTY TOTALS</b>	<b>22.2</b>	<b>32.9</b>	<b>9.7</b>	<b>0.0</b>	<b>0.0</b>	<b>64.9</b>	<b>330</b>	<b>176</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H, and K  
G=B+C+D+E+F  
I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.  
Potable M&I Water Use.  
Average gallons per capita per day potable water use.

In this portion of San Juan County, there is no secondary water used for M&I purposes.

Various per capita rates for public community systems in the San Juan County portion of the West Colorado River Basin are given in **Table 30** on the following page.

**TABLE 30  
SAN JUAN COUNTY  
Average GPCD Water Use  
For Public Community Systems**

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
National Park Service										
Halls Crossing Marina	330	149	0	149	26	0	26	176	0	176
<b>SAN JUAN COUNTY TOTALS</b>	<b>330</b>	<b>149</b>	<b>0</b>	<b>149</b>	<b>26</b>	<b>0</b>	<b>26</b>	<b>176</b>	<b>0</b>	<b>176</b>

\*Commercial, Institutional, and Industrial

**Table 31**, below, indicates annual water use for public non-community, self-supplied industries, and private domestic systems in this portion of the West Colorado River Basin. Hite Marina on Lake Powell within the Glen Canyon Natural Recreation Area and Natural Bridges National Monument are the 2 listed public non-community systems. There are no self-supplied industries or residences using their own wells in this portion of San Juan County. All of these uses amount to about 4 acre-feet of potable water.

**TABLE 31  
SAN JUAN COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Domestic Systems  
(Acre-Feet/Year)**

SAN JUAN COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable use	
<b>Non-Communities</b>						
National Park Service						
Glen Canyon - Hite Marina	1.8	0.0	0.8	0.0	2.6	0.0
Natural Bridges National Monument	1.0	0.0	0.8	0.0	1.8	0.0
<b>Total Non-Community Use</b>	<b>2.8</b>	<b>0.0</b>	<b>1.6</b>	<b>0.0</b>	<b>4.4</b>	<b>0.0</b>
<b>Self-Supplied Industries</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>Private Domestic</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>SAN JUAN COUNTY TOTALS</b>	<b>2.8</b>	<b>0.0</b>	<b>1.6</b>	<b>0.0</b>	<b>4.4</b>	<b>0.0</b>

Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is about 69 acre-feet with no deliveries of secondary water.



## SANPETE COUNTY M&I WATER SUPPLIES AND USES

The Sanpete County portion of the West Colorado River Basin includes no incorporated communities or public community water systems. There are, however, 5 public non-community systems. Locations of the public community and non-community systems are shown in **Figure 3** on page 5. **Table 32**, below gives the water use for public non-community systems in this portion of Sanpete County. There are no self-supplied industries or private domestic wells.

**TABLE 32**  
**SANPETE COUNTY**  
**Water Use for Public Non-Community Systems,**  
**Self-Supplied Industries and Domestic Systems**  
**(Acre-Feet/Year)**

SANPETE COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
<b>Non-Communities</b>						
Forest Service Systems						
Ferron Reservoir Campground	0.0	0.0	1.7	0.0	1.7	0.0
Flat Canyon Campground	0.0	0.0	0.0	0.0	0.0	0.0
Mamouth Guard Station	0.0	0.0	0.1	0.0	0.1	0.0
Twelve Mile Flat Campground	0.0	0.0	0.0	0.0	0.0	0.0
Fairview Lakes Development	3.6	0.0	0.0	0.0	3.6	0.0
<b>Total Non-Community Use</b>	<b>3.6</b>	<b>0.0</b>	<b>1.8</b>	<b>0.0</b>	<b>5.4</b>	<b>0.0</b>
<b>Self-Supplied Industries</b>						
Private Domestic	0.0	0.0	0.0	0.0	0.0	0.0
<b>SANPETE COUNTY</b>	<b>3.6</b>	<b>0.0</b>	<b>1.8</b>	<b>0.0</b>	<b>5.4</b>	<b>0.0</b>

Collectively, the total potable M&I water diversion of all systems in this portion of the West Colorado River Basin is a little over 5 acre-feet and there are no diversions of secondary water.



## SEVIER COUNTY M&I WATER SUPPLIES AND USES

The Sevier County portion of the West Colorado River Basin includes no incorporated communities or public community water systems. However, there are 8 public non-community systems. Locations of the public community and non-community systems are shown in **Figure 3** on page 5. **Table 33**, below, gives the water use for public non-community systems in this portion of Sevier County. There are a few private domestic wells and no self-supplied industries.

**TABLE 33**  
**SEVIER COUNTY**  
**Water Use for Public Non-Community Systems,**  
**Self-Supplied Industries and Domestic Systems**  
**(Acre-Feet/Year)**

SEVIER COUNTY WATER SUPPLIER	POTABLE USAGE					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
<b>Non-Communities</b>						
Forest Service Systems						
Bowery Spring Campground	0.0	0.0	5.3	0.0	5.3	0.0
Doctor Creek Campground	0.0	0.0	2.6	0.0	2.6	0.0
Frying Pan Campground	0.0	0.0	2.4	0.0	2.4	0.0
Twin Creeks Campground	0.0	0.0	9.8	0.0	9.8	0.0
Boulder Mountain Homestead RV Park	1.0	3.0	0.0	0.0	4.0	0.0
Bowery Haven Resort	3.0	0.6	0.0	0.0	3.6	0.0
Fish Lake Lodge	9.0	0.2	0.0	0.0	9.3	0.0
Lakeview Subdivision	2.1	0.0	0.0	0.0	2.1	0.0
Lakeside Resort	6.4	0.0	0.0	0.0	6.4	0.0
<b>Total Non-Community Use</b>	<b>21.5</b>	<b>3.8</b>	<b>20.1</b>	<b>0.0</b>	<b>45.5</b>	<b>0.0</b>
<b>Self-Supplied Industries</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>Private Domestic</b>	5.0	0.0	0.0	0.0	5.0	0.0
<b>SEVIER COUNTY TOTALS</b>	<b>26.5</b>	<b>3.8</b>	<b>20.1</b>	<b>0.0</b>	<b>50.5</b>	<b>0.0</b>

Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is about 51 acre-feet and there are no deliveries of secondary water for M&I purposes.



## UTAH COUNTY M&I WATER SUPPLIES AND USES

The Utah County portion of the West Colorado River Basin includes no incorporated communities, public community water systems, self-supplied industries or public non-community systems. **Table 34**, below, gives the water use for private domestic systems in this portion of Utah County.

**TABLE 34  
UTAH COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Domestic Systems  
(Acre-Feet/Year)**

	POTABLE USAGE					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
<b>Non-Communities</b>						
	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Non-Community Use</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
SELF SUPPLIED INDUSTRIES	0.0	0.0	0.0	0.0	0.0	0.0
PRIVATE DOMESTIC SYSTEMS	4.4	0.5	0.0	0.0	4.9	0.0
<b>UTAH COUNTY TOTALS</b>	<b>4.4</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>	<b>4.9</b>	<b>0.0</b>

Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is about 5 acre-feet and there are no deliveries of secondary water for M&I purposes.



## WASATCH COUNTY M&I WATER SUPPLIES AND USES

The Wasatch County portion of the West Colorado River Basin includes no incorporated communities, public community water systems, self-supplied industries or public non-community systems. This area includes Soldiers Summit and is served by private domestic wells. **Table 35**, below, gives the water use for private domestic systems in this portion of Utah County.

**TABLE 35  
WASATCH COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Domestic Systems  
(Acre-Feet/Year)**

Non-Community System	POTABLE USAGE					Total Secondary Water Use (Ac-Ft/Yr)
	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Potable Use (Ac-Ft/Yr)	
<b>Total Non-Community Use</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
SELF SUPPLIED INDUSTRIES	0.0	0.0	0.0	0.0	0.0	0.0
PRIVATE DOMESTIC SYSTEMS*	1.2	0.5	0.0	0.0	1.7	0.0
<b>WASATCH COUNTY TOTALS</b>	<b>1.2</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>	<b>1.7</b>	<b>0.0</b>

\*Soldier Summit

Collectively, the total potable M&I water use of all systems in this portion of the West Colorado River Basin is about 2 acre-feet and there are no deliveries of secondary water for M&I purposes.



## WAYNE COUNTY M&I WATER SUPPLIES AND USES

Wayne County includes the incorporated communities of Bicknell, Fremont, Hanksville, Loa, Lymon, Teasdale and Torrey. Within this area are 9 public community systems and 7 public non-community systems. One system, Capitol Reef National Park is administered by the National Park Service. Locations of public community and non-community systems are shown in **Figure 3** on page 5.

**Table 36**, below, indicates that the maximum annual water supply for public community systems in this portion of Wayne County is 5,000 acre-feet; 71% from springs and 29% from wells.

**TABLE 36**  
**WAYNE COUNTY**  
**Maximum Potable Water Supplies for Public Community Systems**  
**(Acre-Foot/Year)**

WATER SUPPLIER	Springs	Wells	Surface	Total
Bicknell Culinary Water System	429.3	432.2	0.0	861.5
Caineville Special Service District	0.0	44.0	0.0	44.0
Capitol Reef National Park	0.0	15.0	0.0	15.0
Freemont Waterworks Company Inc.	543.0	0.0	0.0	543.0
Hanksville Culinary Waterworks	0.0	551.7	0.0	551.7
Loa Waterworks Company	233.1	419.9	0.0	653.0
Lyman Culinary Water System	1,442.4	0.0	0.0	1,442.4
Teasdale Special Services District	156.4	0.0	0.0	156.4
Torrey Culinary Water System	733.4	0.0	0.0	733.4
<b>WAYNE COUNTY TOTALS</b>	<b>3,537.5</b>	<b>1,462.8</b>	<b>0.0</b>	<b>5,000.3</b>

Note: All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints.

As shown in **Table 37**, on the following page, the reliable supply of potable water in this portion of the West Colorado River Basin is 2,500 acre-feet or 50% of the maximum supply.

**TABLE 37**  
**WAYNE COUNTY**  
**Reliable Potable Water Supplies for Public Community Systems**  
**(Acre-Feet/Year)**

WATER SUPPLIER	SPRINGS	WELLS	SURFACE	TOTAL
Bicknell Culinary Water System	214.7	216.1	0.0	430.8
Caineville Special Service District	0.0	22.0	0.0	22.0
Capitol Reef National Park	0.0	7.5	0.0	7.5
Freemont Waterworks Company Inc.	271.5	0.0	0.0	271.5
Hanksville Culinary Waterworks	0.0	275.8	0.0	275.8
Loa Waterworks Company	116.6	210.0	0.0	326.5
Lyman Culinary Water System	721.2	0.0	0.0	721.2
Teasdale Special Services District	78.2	0.0	0.0	78.2
Torrey Culinary Water System	366.7	0.0	0.0	366.7
<b>WAYNE COUNTY TOTALS</b>	<b>1,768.8</b>	<b>731.4</b>	<b>0.0</b>	<b>2,500.2</b>

\* Wells are limited to 50% of their "maximum" capacity for reliable supply when well/pump capacity is the limiting factor. Springs are limited to 50% of their maximum supply. Surface water supplies are equal to their respective "maximum" capacities.

**Table 38**, below, shows the breakdown of potable water use for each public community system. This table indicates that for Wayne County, the current annual use of 479 acre-feet of potable water (within the public community systems) is about 19% of the reliable supply.

**TABLE 38**  
**WAYNE COUNTY**  
**Water Use for Public Community Systems**

WAYNE COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial/ Total	Total Potable M & I Use		
Bicknell Culinary Water System	34.2	0.5	10.9	5.1	8.8	59.4	380	140
Caineville Special Service District	3.1	0.0	0.3	0.0	0.0	3.4	40	76
Capitol Reef National Park	3.8	0.0	0.0	3.1	0.1	6.9	50	124
Freemont Waterworks Company Inc.	27.4	5.2	0.0	4.7	23.2	60.5	290	186
Hanksville Culinary Waterworks	12.6	0.0	5.2	3.0	0.0	20.8	170	109
Loa Waterworks Company	51.3	61.6	26.0	3.2	19.6	161.6	550	262
Lyman Culinary Water System	23.2	0.8	0.5	0.1	9.7	34.3	250	122
Teasdale Special Services District	17.7	54.5	1.1	1.7	0.0	75.0	160	418
Torrey Culinary Water System	43.1	0.0	13.4	0.0	0.0	56.5	290	174
<b>WAYNE COUNTY TOTALS</b>	<b>216.2</b>	<b>122.7</b>	<b>57.4</b>	<b>20.9</b>	<b>61.3</b>	<b>478.5</b>	<b>2,180.0</b>	<b>196</b>
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H  
G=B+C+D+E+F  
I=G\*(325,851 gallons per acre-foot)/(365 days per year)/H

Input data.  
Potable M&I Water Use.  
Average gallons per capita per day potable water use.

The following **Table 39** presents the amount of secondary water used by public community systems within the Wayne County portion of the West Colorado River Basin. Total secondary water use is 490 acre-feet.

**TABLE 39**  
**WAYNE COUNTY**  
**Secondary (Non-Potable) Water Use Within Public Community Systems**  
**(Acre-Feet/Year)**

<b>WATER SUPPLIER</b>	<b>Residential Use</b>	<b>Commercial Use</b>	<b>Institutional Use</b>	<b>Industrial/ Stockwater Use</b>	<b>Public Total Secondary Use</b>
Bicknell Culinary Water System	0.0	0.0	0.0	0.0	<b>0.0</b>
Fremont Irrigation Company	80.5	0.0	0.0	0.0	<b>80.5</b>
Caineville Special Service District	0.0	0.0	0.0	0.0	<b>0.0</b>
Cainville Canal Company	7.6	0.0	0.0	0.0	<b>7.6</b>
Capitol Reef National Park*	0.0	0.0	26.0	0.0	<b>26.0</b>
Fremont Waterworks Company Inc.	0.0	0.0	0.0	0.0	<b>0.0</b>
Fremont Irrigation Company	85.0	0.0	0.0	0.0	<b>85.0</b>
Hanksville Culinary Waterworks	0.0	0.0	0.0	0.0	<b>0.0</b>
Hanksville Canal Company	37.5	0.0	6.0	0.0	<b>43.5</b>
Loa Waterworks Company	0.0	0.0	0.0	0.0	<b>0.0</b>
Fremont Irrigation Company	61.4	0.0	8.0	0.0	<b>69.4</b>
Lyman Culinary Water System	0.0	0.0	0.0	0.0	<b>0.0</b>
Fremont Irrigation Company	50.0	0.0	0.0	0.0	<b>50.0</b>
Teasdale Special Services District	0.0	0.0	0.0	0.0	<b>0.0</b>
Bullberry Irrigation Company	32.2	0.0	0.0	0.0	<b>32.2</b>
Torrey Culinary Water System	0.0	0.0	0.0	0.0	<b>0.0</b>
Torrey Canal Company	57.5	0.0	0.0	0.0	<b>57.5</b>
Sand Creek Irrigation Company	38.3	0.0	0.0	0.0	<b>38.3</b>
<b>WAYNE COUNTY TOTALS</b>	<b>450.0</b>	<b>0.0</b>	<b>40.0</b>	<b>0.0</b>	<b>490.0</b>

Note: Separate irrigation companies provide secondary water to the water supplier unless indicated by an '\*'.

**Table 40**, on the next page, presents various per capita rates for the public community systems in the Wayne County portion of the West Colorado River Basin.

**TABLE 40  
WAYNE COUNTY  
Average GPCD Water Use  
For Public Community Systems**

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Bicknell Culinary Water System	380	81	189	270	58	0	58	140	189	329
Caineville Special Service District	40	68	170	238	8	0	8	76	170	245
Capitol Reef National Park	50	68	0	68	56	464	520	124	464	588
Freemont Waterworks Company Inc.	290	100	262	362	86	0	86	186	262	448
Hanksville Culinary Waterworks	170	66	197	263	43	32	75	109	228	338
Loa Waterworks Company	550	183	100	283	79	13	92	262	113	375
Lyman Culinary Water System	250	86	179	264	37	0	37	122	179	301
Teasdale Special Services District	160	403	180	582	16	0	16	418	180	598
Torrey Culinary Water System	290	133	295	428	41	0	41	174	295	469
<b>WAYNE COUNTY TOTALS</b>	<b>2,180</b>	<b>139</b>	<b>184</b>	<b>323</b>	<b>57</b>	<b>16</b>	<b>74</b>	<b>196</b>	<b>201</b>	<b>397</b>

\*Commercial, Institutional, and Industrial

Table 41, below, indicates annual water use for public non-community systems and private domestic systems in this portion of the West Colorado River Basin. There are no self-supplied industries but several private domestic wells. All of these uses amount to about 79 acre-feet of potable water.

**TABLE 41  
WAYNE COUNTY  
Water Use for Public Non-Community Systems,  
Self-Supplied Industries and Private Domestic Systems  
(Acre-Feet/Year)**

Non-Community System	POTABLE USAGE					Total Secondary Water Use (Ac-Ft/Yr)
	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Potable Use (Ac-Ft/Yr)	
Forest Service Systems						
Elkhorn Campground & Guard Station	0.0	0.0	0.3	0.0	0.3	0.0
Single Tree Campground	0.0	0.0	6.3	0.0	6.3	0.0
Hollow Mountain	0.0	1.0	0.0	0.0	1.0	0.0
Redrock Café	0.0	1.5	0.0	0.0	1.5	0.0
Sleepy Hollow Campground	1.6	1.0	0.0	0.0	2.6	0.0
Thousand Lakes RV Park	0.0	2.5	0.0	0.0	2.5	0.0
<b>Total Non-Community Use</b>	<b>1.6</b>	<b>6.0</b>	<b>6.6</b>	<b>0.0</b>	<b>14.1</b>	<b>0.0</b>
SELF SUPPLIED INDUSTRIES	0.0	0.0	0.0	0.0	0.0	0.0
PRIVATE DOMESTIC SYSTEMS	65.0	0.0	0.0	0.0	65.0	0.0
<b>WAYNE COUNTY</b>	<b>66.6</b>	<b>6.0</b>	<b>6.6</b>	<b>0.0</b>	<b>79.1</b>	<b>0.0</b>

Collectively, the total potable M&I water use from all systems in the Wayne County portion of the West Colorado River Basin is 558 acre-feet and secondary use is 490 acre-feet; giving a total M&I water use of about 1,048 acre-feet.



**APPENDIX A**  
**PRICE RIVER WATER IMPROVEMENT DISTRICT**  
**WATER USE DATA FORM**



AR 3/30/04  
**UTAH WATER USE DATA FORM**  
**DATA FOR 2003**

Information jointly requested by:  
 Utah Division of Water Resources, 558-7284  
 Utah Division of Drinking Water, 536-4200, and  
 Utah Division of Water Rights, 538-7192.

Return completed form to:  
 Utah Division of Water Rights  
 PO Box 146300  
 Salt Lake City, UT 84114-6300

System Name: Price River Water Improvement District  
 Address: P.O. Box 903  
Price, UT 84501

Population Served: + 9700 DEQ#: 04020  
 County: Carbon  
 E-Mail Address: \_\_\_\_\_

Contact Person: Ken Snook  
 Form filled out by: Ken Snook

Phone Number: (435) 472-3103  
 Phone Number: \_\_\_\_\_

I. STORAGE INVENTORY: Total treated storage capacity: 4,075,000 in gallons. Number of Tanks: 4

II. SOURCE INVENTORY:

1. Source Name: Price City Water Type: Spring Location: Sec. 1, T. 8, R. 65M NR Number: \_\_\_\_\_  
 Method of Measurement:  Master Meter,  Salinometer,  Other  
 Units of Measurement: Million Gallons  
 Are there any spills/overflow?  Yes,  No. If yes, estimate annual quantity \_\_\_\_\_ where in source measured?  Before overflow,  After overflow.  
 When do spills/overflow occur? \_\_\_\_\_ Are spills/overflow included in the quantities reported?  Yes  No

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
12.21	12.18	12.38	12.04	4.03	0	0	0	0	0	10.80	14.51	78.14

2. Source Name: Price River Type: Stream Location: Sec. 1, T. 8, R. 65M NR Number: \_\_\_\_\_  
 Method of Measurement:  Master Meter,  Salinometer,  Other  
 Units of Measurement: Million Gallons

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
19.34	13.79	19.69	23.75	60.26	76.33	88.49	59.40	53.32	49.32	18.25	13.22	492.13

3. Source Name: Transferred to Price Type: Stream Location: Sec. 1, T. 8, R. 65M NR Number: \_\_\_\_\_  
 Method of Measurement:  Master Meter,  Salinometer,  Other  
 Units of Measurement: Million Gallons

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
0	0	0	0	7.32	14.71	14.81	0	0	0	0	0	36.83

**RECEIVED**  
 SC MAR 30 2004

**WATER RIGHTS**  
**SALT LAKE**

78.15

36.84

**III. WATER USE BREAKDOWN:** (Please use sum of the readings from individual meters, not meter meter readings as source, if quantities are not known, please estimate. See instructions for definition of uses shown in bold).

Units of Measurement: Million Gallons

Residential: Annual quantity of water delivered for residential purposes 447,520,650 Total number of residential connections 1689  
 Meter readings at individual connections (X) or Estimated ( )

Commercial: Annual quantity of water delivered for commercial purposes 4,400,000 Total number of commercial connections 24  
 Meter readings at individual connections ( ) or Estimated (X) Units per connection (avg) 9

Industrial: Annual quantity of water delivered for industrial purposes 0 Total number of industrial connections 0  
 Meter readings at individual connections ( ) or Estimated ( )

Institutional: Annual quantity of water delivered for institutional purposes 0 Total number of institutional connections 0  
 Meter readings at individual connections ( ) or Estimated ( )

Stockwatering: Annual quantity of water delivered for stockwatering purposes 55,000 Total number of stockwatering connections 1  
 Meter readings at individual connections (X) or Estimated ( )

Wholesale: Annual quantity of water delivered for wholesale purposes 122,941,350 Please attach a listing of those supplied, **1109 Who**  
 Meter readings at individual connections ( ) or Estimated (X) **resale**

Other Uses: Annual quantity of water delivered for other purposes 0 Total number of other connections 0  
 Meter readings at individual connections ( ) or Estimated ( ) Describe other uses

Unmetered: Annual estimate of water delivered by unmetered connections \_\_\_\_\_ Total number of unmetered connections \_\_\_\_\_  
 Unmetered connections used for \_\_\_\_\_

Total annual quantity of water delivered for all purposes: 607,10 Total number of all connections: 2798  
 Of this total, how many connections are active: all

**IV. IRRIGATION SYSTEM** (Separate lawn and garden irrigation system, whether controlled by the drinking water supplier or not)

Is any of your area served by a separate ditch or pipe fed irrigation water system?  Yes, ( ) No. If yes, please provide the following information:  
 What percent of your customers are served by a separate irrigation system? 60%  
 Of these customers, what percent are served by ditch? 50%  
 What percent are served by pressurized pipe? 50%

Do you operate and maintain the separate lawn and garden irrigation water system? ( ) Yes, (X) No  
 If the separate irrigation system is operated by other entities, please give name of companies, contact person & phone number:

Price River Water Users Assoc., Ann O'Brien 613-9793

## APPENDIX B



## APPENDIX B 2005 West Colorado River Basin M&I Deliveries and Depletions

WATER SUPPLIER	Potable Residential Indoor Use	Potable Residential Outdoor Use	Potable Commercial Use	Potable Institutional Use	Potable Industrial/Stockwater Use	Total Potable Use	Secondary Water Use	Total Indoor Use	Total Outdoor Use	Res. Indoor Return Flow	Commercial Indoor Return Flow	Institutional Indoor Return Flow	Industrial/Stockwater Return Flow	Total Indoor Return Flow	Total Indoor to Treatment Facility	Pond Evaporation	Facility Outflow (Indoor Return Flow)	Outdoor Return Flow	Total Return Flow	Total Deliveries	Total Depletions
<b>CARBON COUNTY</b>																					
East Carbon & Columbia Municipal	118.6	299.7	0.2	0.0	47.6	466.1	0.0	166.4	299.7	116.2	0.2	0.0	0.0	116.4	116.4	152.4	0.0	99.9	99.9	466.1	366.2
Helper Municipal Water System	159.2	69.8	42.0	18.0	1.0	290.0	179.4	197.4	272.0	156.0	32.9	3.5	0.0	192.5	192.5	0.0	182.8	90.7	273.5	469.4	195.9
Price Municipal Water System	578.3	669.0	240.9	547.2	22.7	2,058.1	0.0	903.2	1,154.9	566.7	188.9	107.3	0.0	862.8	862.8	0.0	819.7	385.0	1,204.7	2,058.1	853.4
Price River Water Improvement Dist.	521.0	632.3	53.5	0.0	0.0	1,206.7	1,065.0	563.7	1,708.0	510.5	41.9	0.0	0.0	552.4	552.4	0.0	524.8	569.3	1,094.1	2,271.7	1,177.5
Spring Glen Water Company	63.3	0.0	0.0	0.0	0.0	63.3	137.7	63.3	137.7	62.1	0.0	0.0	0.0	62.1	62.1	0.0	59.0	45.9	104.9	201.0	96.2
Wellington Culinary Water	139.9	0.0	26.6	15.6	4.8	186.9	290.0	169.1	307.8	137.1	20.8	3.1	0.0	161.0	161.0	0.0	152.9	102.6	255.5	476.9	221.3
Sunnyside City Water	35.9	100.8	0.7	1.7	13.0	152.0	0.0	49.7	102.3	35.2	0.5	0.3	0.0	36.0	36.0	42.5	0.0	34.1	34.1	152.0	117.9
<b>Total Community Systems</b>	<b>1,616.1</b>	<b>1,771.6</b>	<b>363.8</b>	<b>582.5</b>	<b>89.1</b>	<b>4,423.1</b>	<b>1,672.1</b>	<b>2,112.8</b>	<b>3,982.4</b>	<b>1,583.8</b>	<b>285.3</b>	<b>114.2</b>	<b>0.0</b>	<b>1,983.2</b>	<b>1,983.2</b>	<b>194.9</b>	<b>1,739.2</b>	<b>1,327.5</b>	<b>3,066.7</b>	<b>6,095.2</b>	<b>3,028.5</b>
Non-community Systems	19.3	4.8	0.1	13.6	0.0	37.8	0.0	22.1	15.7	18.9	0.1	2.7	0.0	21.6	21.6	0.0	20.6	5.2	25.8	37.8	12.0
Self Supplied Industries	0.0	0.0	0.0	0.0	51.4	51.4	3,838.3	3,889.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,889.9	3,889.9
Private Domestic Systems	19.2	4.8	0.0	0.0	0.0	24.0	0.0	19.2	4.8	18.8	0.0	0.0	0.0	18.8	18.8	0.0	17.9	1.6	19.5	24.0	4.5
<b>COUNTY TOTALS</b>	<b>1,654.6</b>	<b>1,781.2</b>	<b>363.9</b>	<b>596.1</b>	<b>140.5</b>	<b>4,536.3</b>	<b>5,510.6</b>	<b>6,044.0</b>	<b>4,003.0</b>	<b>1,621.5</b>	<b>285.3</b>	<b>116.8</b>	<b>0.0</b>	<b>2,023.6</b>	<b>2,023.6</b>	<b>194.9</b>	<b>1,777.7</b>	<b>1,334.3</b>	<b>3,112.0</b>	<b>10,046.9</b>	<b>6,934.9</b>
<b>EMERY COUNTY</b>																					
Castle Valley SSD	653.3	704.1	29.2	32.5	38.7	1,457.8	882.2	721.8	1,618.1	640.3	22.9	6.4	0.0	669.5	669.5	555.0	81.0	539.4	620.4	2,340.0	1,719.6
Green River Municipal Water	70.5	12.6	141.4	8.0	3.2	235.7	82.0	188.4	129.3	69.1	110.9	1.6	0.0	181.5	181.5	179.4	0.0	43.1	43.1	317.7	274.6
North Emery Water Users SSD	126.0	70.0	9.2	0.5	1.9	207.7	135.6	135.4	207.6	123.5	7.2	0.1	0.0	130.8	130.8	0.0	124.3	69.3	193.6	343.3	149.7
Trail Canyon Residential System	2.6	5.5	0.0	0.0	0.0	8.1	0.0	2.6	5.5	2.5	0.0	0.0	0.0	2.5	2.5	0.0	2.4	1.8	4.2	8.1	3.9
<b>Total Community Systems</b>	<b>852.4</b>	<b>792.3</b>	<b>179.8</b>	<b>41.0</b>	<b>43.8</b>	<b>1,909.2</b>	<b>1,099.8</b>	<b>1,048.2</b>	<b>1,960.8</b>	<b>835.3</b>	<b>141.0</b>	<b>8.0</b>	<b>0.0</b>	<b>984.4</b>	<b>984.4</b>	<b>734.4</b>	<b>207.6</b>	<b>653.6</b>	<b>861.2</b>	<b>3,009.0</b>	<b>2,147.8</b>
Non-community Systems	4.2	1.1	0.0	15.7	0.0	20.9	0.0	7.3	13.6	4.1	0.0	3.1	0.0	7.2	7.2	0.0	6.8	4.5	11.4	20.9	9.6
Self Supplied Industries	0.0	0.0	0.0	0.0	385.3	385.3	28,556.3	28,942.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28,942.1	28,942.1
Private Domestic Systems	4.0	1.0	0.0	0.0	0.0	5.0	0.0	4.0	1.0	3.9	0.0	0.0	0.0	3.9	3.9	0.0	3.7	0.3	4.1	5.0	0.9
<b>COUNTY TOTALS</b>	<b>860.6</b>	<b>794.3</b>	<b>179.8</b>	<b>56.6</b>	<b>429.0</b>	<b>2,320.4</b>	<b>29,656.6</b>	<b>30,001.6</b>	<b>1,975.4</b>	<b>843.4</b>	<b>141.0</b>	<b>11.1</b>	<b>0.0</b>	<b>995.5</b>	<b>984.4</b>	<b>734.4</b>	<b>218.2</b>	<b>658.5</b>	<b>876.7</b>	<b>31,977.0</b>	<b>31,100.4</b>
<b>GARFIELD COUNTY</b>																					
Boulder Farmstead Water Company	8.8	25.6	4.5	1.6	0.5	41.0	5.6	13.2	33.3	8.6	3.5	0.3	0.0	12.5	12.5	0.0	11.9	11.1	23.0	46.6	23.6
Escalante Culinary Water	74.8	30.5	30.0	20.5	5.3	161.1	250.0	108.2	302.9	73.3	23.5	4.0	0.0	100.8	100.8	68.2	27.6	101.0	128.6	411.1	282.5
Ticaboo SSD#1	3.5	8.8	39.1	0.0	0.0	51.4	0.0	34.8	16.6	3.4	30.7	0.0	0.0	34.1	34.1	18.9	13.5	5.5	19.0	51.4	32.4
<b>Total Community Systems</b>	<b>87.1</b>	<b>64.9</b>	<b>73.6</b>	<b>22.1</b>	<b>5.8</b>	<b>253.5</b>	<b>255.6</b>	<b>156.2</b>	<b>352.9</b>	<b>85.3</b>	<b>57.7</b>	<b>4.3</b>	<b>0.0</b>	<b>147.4</b>	<b>147.4</b>	<b>87.1</b>	<b>52.9</b>	<b>117.6</b>	<b>170.5</b>	<b>509.1</b>	<b>338.5</b>
Non-community Systems	0.0	0.0	0.0	9.6	0.0	9.6	0.0	1.9	7.5	0.0	0.0	1.9	0.0	1.9	1.9	0.0	1.8	2.5	4.3	9.6	5.2
Self Supplied Industries	0.0	0.0	0.0	0.0	10.1	10.1	0.0	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	10.1
Private Domestic Systems	8.0	2.0	0.0	0.0	0.0	10.0	0.0	8.0	2.0	7.5	0.0	0.0	0.0	7.5	7.5	0.0	7.4	0.7	8.1	10.0	1.9
<b>COUNTY TOTALS</b>	<b>95.1</b>	<b>66.9</b>	<b>73.6</b>	<b>31.7</b>	<b>15.9</b>	<b>283.1</b>	<b>255.6</b>	<b>176.2</b>	<b>362.5</b>	<b>93.2</b>	<b>57.7</b>	<b>6.2</b>	<b>0.0</b>	<b>157.1</b>	<b>162.2</b>	<b>87.1</b>	<b>62.1</b>	<b>120.8</b>	<b>183.0</b>	<b>538.7</b>	<b>355.7</b>
<b>GRAND COUNTY</b>																					
Thompson Water Improvement Dist.	7.0	6.5	5.5	11.9	0.0	30.9	0.0	13.8	17.1	6.9	4.3	2.3	0.0	13.5	13.5	0.0	12.8	5.7	18.5	30.9	12.3
<b>Total Community Systems</b>	<b>7.0</b>	<b>6.5</b>	<b>5.5</b>	<b>11.9</b>	<b>0.0</b>	<b>30.9</b>	<b>0.0</b>	<b>13.8</b>	<b>17.1</b>	<b>6.9</b>	<b>4.3</b>	<b>2.3</b>	<b>0.0</b>	<b>13.5</b>	<b>13.5</b>	<b>0.0</b>	<b>12.8</b>	<b>5.7</b>	<b>18.5</b>	<b>30.9</b>	<b>12.3</b>
Non-community Systems	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	0.0	0.0	0.0	0.0	0.0	0.0
<b>COUNTY TOTALS</b>	<b>7.0</b>	<b>6.5</b>	<b>5.5</b>	<b>11.9</b>	<b>0.0</b>	<b>30.9</b>	<b>0.0</b>	<b>13.8</b>	<b>17.1</b>	<b>6.9</b>	<b>4.3</b>	<b>2.3</b>	<b>0.0</b>	<b>13.5</b>	<b>13.5</b>	<b>0.0</b>	<b>12.8</b>	<b>5.7</b>	<b>18.5</b>	<b>30.9</b>	<b>12.3</b>
<b>KANE COUNTY</b>																					
Natl. Park Serv. Bullfrog Rec. Site	43.6	22.8	189.1	0.0	0.0	255.5	0.0	194.9	60.6	42.8	148.2	0.0	0.0	191.0	191.0	65.6	115.8	20.2	136.0	255.5	119.5
<b>Total Community Systems</b>	<b>43.6</b>	<b>22.8</b>	<b>189.1</b>	<b>0.0</b>	<b>0.0</b>	<b>255.5</b>	<b>0.0</b>	<b>194.9</b>	<b>60.6</b>	<b>42.8</b>	<b>148.2</b>	<b>0.0</b>	<b>0.0</b>	<b>191.0</b>	<b>191.0</b>	<b>65.6</b>	<b>115.8</b>	<b>20.2</b>	<b>136.0</b>	<b>255.5</b>	<b>119.5</b>
Non-community Systems	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	0.0	0.0	0.0	0.0	0.0	0.0
<b>COUNTY TOTALS</b>	<b>43.6</b>	<b>22.8</b>	<b>189.1</b>	<b>0.0</b>	<b>0.0</b>	<b>255.5</b>	<b>0.0</b>	<b>194.9</b>	<b>60.6</b>	<b>42.8</b>	<b>148.2</b>	<b>0.0</b>	<b>0.0</b>	<b>191.0</b>	<b>191.0</b>	<b>65.6</b>	<b>115.8</b>	<b>20.2</b>	<b>136.0</b>	<b>255.5</b>	<b>119.5</b>
<b>SAN JUAN COUNTY</b>																					
Natl. Pk. Serv. Halls Crossing Marina	22.2	32.9	9.7	0.0	0.0	64.9	0.0	30.0	34.9	21.8	7.6	0.0	0.0	29.4	29.4	24.3	3.6	11.6	15.3	64.9	49.6
<b>Total Community Systems</b>	<b>22.2</b>	<b>32.9</b>	<b>9.7</b>	<b>0.0</b>	<b>0.0</b>	<b>64.9</b>	<b>0.0</b>	<b>30.0</b>	<b>34.9</b>	<b>21.8</b>	<b>7.6</b>	<b>0.0</b>	<b>0.0</b>	<b>29.4</b>	<b>29.4</b>	<b>24.3</b>	<b>3.6</b>	<b>11.6</b>	<b>15.3</b>	<b>64.9</b>	<b>49.6</b>
Non-community Systems	2.2	0.6	0.0	1.6	0.0	4.4	0.0	3.0	0.0	2.2	0.0	1.5	0.0	3.7	3.7	0.0	0.0	0.2	0.2	4.4	4.2
<b>COUNTY TOTALS</b>	<b>24.5</b>	<b>33.5</b>	<b>9.7</b>	<b>1.6</b>	<b>0.0</b>	<b>69.3</b>	<b>0.0</b>	<b>33.8</b>	<b>35.4</b>	<b>24.0</b>	<b>7.6</b>	<b>1.5</b>	<b>0.0</b>	<b>33.1</b>	<b>33.1</b>	<b>28.0</b>	<b>3.6</b>	<b>11.8</b>	<b>15.5</b>	<b>69.3</b>	<b>53.8</b>
<b>SANPETE COUNTY</b>																					
Non-community Systems	2.9	0.7	0.0	1.8	0.0	5.4	0.0	3.2	2.2	2.8	0.0	0.4	0.0	3.2	0.0	0.0	3.0	0.7	3.7	5.4	1.7
<b>COUNTY TOTALS</b>	<b>2.9</b>	<b>0.7</b>	<b>0.0</b>	<b>1.8</b>	<b>0.0</b>	<b>5.4</b>	<b>0.0</b>	<b>3.2</b>	<b>2.2</b>	<b>2.8</b>	<b>0.0</b>	<b>0.4</b>	<b>0.0</b>	<b>3.2</b>	<b>0.0</b>	<b>0.0</b>	<b>3.0</b>	<b>0.7</b>	<b>3.7</b>	<b>5.4</b>	<b>1.7</b>
<b>SEVIER COUNTY</b>																					
Non-community systems, etc.	17.2	4.3	3.8	20.1	0.0	45.5	0.0	24.3	21.2	16.9	3.0	3.9	0.0	23.8	16.0	16.0	6.6	7.1	13.7	45.5	31.8
Private Domestic Systems	4.0	1.0	0.0	0.0	0.0	5.0	0.0	4.0	1.0	3.9	0.0	0.0	0.0	3.9	3.8	0.0	3.7	0.3	4.1	5.0	0.9
<b>COUNTY TOTALS</b>	<b>21.2</b>	<b>5.3</b>	<b>3.8</b>	<b>20.1</b>	<b>0.0</b>	<b>50.5</b>	<b>0.0</b>	<b>28.3</b>	<b>22.2</b>	<b>20.8</b>	<b>3.0</b>	<b>3.9</b>	<b>0.0</b>	<b>27.7</b>	<b>19.8</b>	<b>16.0</b>	<b>10.4</b>	<b>7.4</b>	<b>17.7</b>	<b>50.5</b>	<b>32.7</b>
<b>UTAH COUNTY</b>																					
Private Domestic systems	3.5	0.9	0.5	0.0	0.0	4.9	0.0	3.9	1.0	3.4	0.4	0.0	0.0	3.8	3.8	0.0	3.6	0.3	4.0	4.9	0.9
<b>COUNTY TOTALS</b>																					