MUNICIPAL AND INDUSTRIAL WATER SUPPLY STUDIES

UTAH STATE SUMMARY

2000

Prepared by

Utah Department of Natural Resources
Division of Water Resources

December 2003

ACKNOWLEDGMENTS

The municipal and industrial water use information summarized in this report was gathered under the direction of Lloyd H. Austin, retired assistant director, and Paul L. Gillette, retired deputy director. Eric K. Klotz, Chief of the Water Conservation, Education and Use Section, directed the preparation of this report, as well as participated in the referenced individual Municipal and Industrial (M&I) reports.

Other staff members that collected and/or analyzed the data of this report since 1992 include: David G. Peterson, Dallas Wall, and Gregory Williams, with assistance from Harold Brown (retired), Todd Adams, and Lee Sporleder.

Appreciation is also given to the staff of Hansen, Allen & Luce, Inc. for their contributions. Additionally, recognition is given to the cooperation and efforts of the Division of Water Rights and the numerous water supplying entities that provided most of the data for this report.

This summary report was prepared by Dallas Wall and Gregory Williams, with illustrations by Sara Larsen.

D. Larry Anderson, Director

TABLE OF CONTENTS

Acknowledgments i

Table of Contents iii

List of Tables vi

List of Figures viii

Executive Summary xi

Section 1 Introduction 1
1.1 Authority 1
1.2 Scope 1
1.3 Data Collection 1
1.4 Water System Classifications 2
1.5 Water Supply and Use Methodology 2
1.5.1 Present Methodology for Public Community Water Systems 2
1.5.1.1 Residential Use 4
1.5.1.2 Commercial Use 4
1.5.1.3 Institutional Use 5
1.5.1.4 Industrial Use 5
1.5.2 Present Methodology for Non-Community Water Systems . 5
1.5.3 Source Capacity 6
1.6 Definitions of Water Terms 7
1.6.1 Water Supply Terms 7
1.6.2 Water Use Terms 8
1.6.3 Other Water Terms 9

Section 2 Municipal and Industrial Water Use by Basin 11
2.1 Basin Delineation 11
2.2 West Desert Basin 13
2.2.1 Basin Water Use 13
2.2.2 Public Community Water Systems - Source of Supply 15
2.2.3 Public Community Water Systems - Water Use 15
2.3 Bear River Basin 17
2.3.1 Basin Water Use 17
2.3.2 Public Community Systems- Source of Supply 19
2.3.3 Public Community Systems- Water Use 19
2.4 Weber River Basin 23
2.4.1 Basin Water Use 23
2.4.2 Public Community Systems - Source of Supply 25

TABLE OF CONTENTS (Cont.)

Section 2 - cont. **Page**

2.4.3 Public Community Systems - Water use 25
2.5 Utah Lake Basin 27
2.5.1 Basin Water Use 27
2.5.2 Public Community Systems - Source of Supply 29
2.5.3 Public Community Systems - Water Use 29
2.6 Jordan River Basin 31
2.6.1 Basin Water Use 31
2.6.2 Public Community Systems - Source of Supply 33
2.6.3 Public Community Systems - Water Use 33
2.7 Sevier River Basin 35
2.7.1 Basin Water Use 35
2.7.2 Public Community Systems - Source of Supply 37
2.7.3 Public Community Systems - Water Use 37
2.8 Cedar/Beaver Basin 39
2.8.1 Basin Water Use 39
2.8.2 Public Community Systems - Source of Supply 41
2.8.3 Public Community Systems - Water Use 41
2.9 Uintah Basin 43
2.9.1 Basin Water Use 43
2.9.2 Public Community Systems - Source of Supply 45
2.9.3 Public Community Systems - Water Use 45
2.10 West Colorado River Basin 47
2.10.1 Basin Water Use 47
2.10.2 Public Community Systems - Source of Supply 49
2.10.3 Public Community Systems - Water Use 49
2.11 Southeast Colorado River Basin 51
2.11.1 Basin Water Use 51
2.11.2 Public Community Systems - Source of Supply 53
2.11.3 Public Community Systems - Water Use 53
2.12 Kanab Creek/Virgin River Basin 55
2.12.1 Basin Water Use 55
2.12.2 Public Community Systems - Source of Supply 57
2.12.2 Public Community Systems - Water Use 57

Section 3 Statewide Summary 59
3.1 Statewide Water Use 59
3.2 Public Community Water Systems -
Statewide Source of Supply 62
3.3 Public Community Water Systems - Statewide Water Use 64

TABLE OF CONTENTS (Cont.)

Appendix A 67

Appendix B 73

Appendix C 79

References 85

LIST OF TABLES

Table	Title	Page
1-1	Hydrologic Basin and County Correlation	2
2-1	Water Use of the West Desert Basin	13
2-2	Total and Per-capita Water Use of Public Community Water Systems Within the West Desert Basin	16
2-3	Water Use of the Bear River Basin	17
2-4	Total and Per-capita Water Use of Public Community Water Systems Within the Bear River Basin	20
2-5	Water Use of the Weber River Basin	23
2-6	Total and Per-capita Water Use of Public Community Water Systems Within the Weber River Basin	26
2-7	Water Use of the Utah Lake Basin	27
2-8	Total and Per-capita Water Use of Public Community Water Systems Within the Utah Lake Basin	30
2-9	Water Use of the Jordan River Basin	31
2-10	Total and Per-capita Water Use of Public Community Water Systems Within the Jordan River Basin	34
2-11	Water Use of the Sevier River Basin	35
2-12	Total and Per-capita Water Use of Public Community Water Systems Within the Sevier River Basin	38
2-13	Water Use of the Cedar/Beaver Basin	39
2-14	Total and Per-capita Water Use of Public Community Water Systems Within the Cedar/Beaver Basin	42
2-15	Water Use of the Uintah Basin	43
2-16	Total and Per-capita Water Use of Public Community Water Systems Within the Uintah Basin	46
2-17	Water Use of the West Colorado River Basin	47
2-18	Total and Per-capita Water Use of Public Community Water Systems Within the West Colorado River Basin	50
2-19	Water Use of the Southeast Colorado River Basin	51
2-20	Total and Per-capita Water Use of Public Community Water Systems Within the Southeast Colorado River Basin	54
2-21	Water Use of the Kanab Creek/Virgin River Basin	55
2-22	Total and Per-capita Water Use of Public Community Water Systems Within the Kanab Creek/Virgin River Basin	58
3-1	Total Statewide Municipal and Industrial Categorical Water Use	60
3-2	Total and Per-capita Water Use of Public Community Water Systems of the State of Utah	65
3-3	Indoor/Outdoor Water Use of Public Community Water Systems of the State of Utah	66

LIST OF TABLES (Cont.)

Table	Title	Page
A-1	Hydrologic Basin Total M&I Categorical Water Use	69
A-2	Hydrologic Basin M&I Categorical Water Use	70
A-3	Hydrologic Basin Total Potable and Non-Potable Water Use	71
A-4	Hydrologic Basin Public Community Systems - Categorical Per Capita Water Use	72
B-1	County Total M&I Categorical Water Use	75
B-2	County Categorical M&I Water Use	76
B-3	County Categorical Potable and Non Potable Water Use	77
B-4	County Public Community Systems Per Capita Water Use	78
C-1	Potable Water Use - Public Community Systems	81
C-2	Potable Water Use - Public Non Community Non Transient Systems	82
C-3	Potable Water Use - Public Non Community Systems	83
C-4	Non Potable Water Use - All Public Systems	84

LIST OF FIGURES

Figure	Title	Page
2-1	Hydrologic Basins of Utah	11
2-2	Public Community Systems Within the West Desert Basin	14
2-3	Maximum Potable Water Supply for Public Community Water Systems	15
2-4	Public Community Systems Categorical Water Use	16
2-5	Public Community Systems Within the Bear River Basin	18
2-6	Maximum Potable Supply for Public Community Water Systems	19
2-7	Public Community Systems Categorical Water Use	21
2-8	Public Community Systems Within the Weber River Basin	24
2-9	Maximum Potable Supply for Public Community Water Systems	25
2-10	Public Community Systems Categorical Water Use	26
2-11	Public Community Systems Within the Utah Lake Basin	28
2-12	Maximum Potable Supply for Public Community Water Systems	29
2-13	Public Community Systems Categorical Water Use	30
2-14	Public Community Systems Within the Jordan River Basin	32
2-15	Maximum Potable Supply for Public Community Water Systems	33
2-16	Public Community Systems Categorical Water Use	34
2-17	Public Community Systems Within the Sevier River Basin	36
2-18	Maximum Potable Supply for Public Community Water Systems	37
2-19	Public Community Systems Categorical Water Use	38
2-20	Public Community Systems Within the Cedar/Beaver Basin	40
2-21	Maximum Potable Supply for Public Community Water Systems	41
2-22	Public Community Systems Categorical Water Use	42
2-23	Public Community Systems Within the Uintah Basin	44
2-24	Maximum Potable Supply for Public Community Water Systems	45
2-25	Public Community Systems Categorical Water Use	46
2-26	Public Community Systems Within the West Colorado River Basin	48
2-27	Maximum Potable Supply for Public Community Water Systems	49
2-28	Public Community Systems Categorical Water Use	50
2-29	Public Community Systems Within the Southeast Colorado River Basin	52
2-30	Maximum Potable Supply for Public Community Water Systems	53
2-31	Public Community Systems Categorical Water Use	54
2-32	Public Community Systems Within the Kanab Creek/Virgin River Basin	56
2-33	Maximum Potable Supply for Public Community Water Systems	57

LIST OF FIGURES (Cont.)

Figure	Title	Page
2-34	Public Community Systems Categorical Water Use	58
3-1	Statewide Total M&I Water Use	60
3-2	Statewide Categorical Total M&I Water Use	61
3-3	Statewide Summary of Water Supply Sources for Public Community Water Systems	62
3-4	Statewide Public Community Water Systems Categorical Water Use	64

EXECUTIVE SUMMARY

After the issuance of the *Utah State Water Plan* in 1990, the Utah Division of Water Resources (the division) recognized the need to specifically address the quickly growing demands for municipal and industrial (M&I) water. Accordingly, the division commenced the effort to quantify, in detail, all the uses of both potable (drinking) and non-potable M&I water in each of the community, non-community, and private domestic water systems of the state (see **Section 1.6.1** for definitions of the types of water systems). With the completion of the *Municipal and Industrial Water Supply Studies* for all of the hydrologic basins of the state, the division now offers this statewide summary to enhance the capabilities of water managers of the state to quickly and accurately access information about M&I water use on a statewide level.

The *Municipal and Industrial Water Supply Studies* were completed for the eleven hydrologic basins with data collected for 1992 and up to the year 2000 from each of the over 450 water systems of the state. This statewide summary is a compilation of the data and can be considered, for reference purposes, to be representative of the statewide municipal and industrial water usage for the calender year of 2000.

Within the state of Utah, over 850,000 acre-feet of water (an acre-foot is the amount of water required to cover one acre of area, one foot deep or 325,851 gallons) is used annually for M&I purposes. Specifically, the above mentioned data indicates a total of 853,623 acre-feet of statewide M&I water use. Close to three-quarters of that total (632,242 acre-feet) is potable (drinking) water, with the remaining 221,381 acre-feet being non-potable water. The following table gives a broad overall breakdown of potable and non-potable water use in the state:

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	539,067	127,738	666,805
PUBLIC NON-COMMUNITY TRANSIENT	2,160	2,484	4,644
PUBLIC NON-COMMUNITY NON-TRANSIENT	72,228	91,158 *	163,387
PRIVATE DOMESTIC	18,788	0	18,788
STATEWIDE TOTALS	632,242	221,381	853,623

*An additional 250,961 acre-feet of saline water used in Tooele and Weber counties for industrial purposes is not included in this figure.

From the standpoint of types of water systems, 85.3% of potable M&I water is delivered by Public Community water systems, 0.3% by Public Non-Community Transient, 11.4% by Public Non-Community Non-Transient, and 3.0% Private Domestic water systems. The largest category, Public Community systems, receives a total of 52% of their water supplies from wells, 14% from springs, and 34% from surface sources. The maximum annual water supply of all public community water systems is estimated to be 1,238,518 acre-feet, with a combined annual reliable systems capacity of 828,033 acre-feet of water.

All of the Public Community water systems collectively delivered a statewide total of 666,805 acre-feet of water. The table on the following two pages provides a detailed breakdown of the water use by the Public Community water systems in each of the hydrologic basins of the state:

2000 COMPOSITE STATEWIDE WATER USE
Public Community Water Systems
(continued on next page)

Hydrologic River Basin		Bear		Weber		Jordan		Utah Lake		Uintah		West Colorado	
			Population		Population		Population	1993	Population		Population		Population
WATER USE CATAGORY		1999	126,418	1992	387,112	1999	879,850	1998	354,000	1995	35,778	1996	36,523
		Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD
POTABLE													
Residential:	Indoor	9,974	70	29,271	68	69,162	70	26,964	68	2,845	71	2,987	73
	Outdoor	15,930	113	20,235	47	105,125	107	30,116	76	3,622	90	4,630	113
	Total	25,904	183	49,506	114	174,287	177	57,080	144	6,467	161	7,617	186
Commercial:	Indoor	3,138	22	9,414	22	28,267	29	7,697	19	706	18	812	20
	Outdoor	785	6	2,353	5	7,067	7	1,924	5	176	4	203	5
	Total	3,923	28	11,767	27	35,334	36	9,621	24	882	22	1,015	25
Institutional:	Indoor	505	4	4,219	10	5,187	5	2,855	7	243	6	240	6
	Outdoor	2,020	14	16,878	39	20,748	21	11,418	29	972	24	959	23
	Total	2,525	18	21,097	49	25,935	26	14,273	36	1,215	30	1,199	29
Industrial:	**Total**	3,713	26	2,682	6	10,744	11	5,185	13	1,026	26	360	9
	Subtotal	**36,065**	**255**	**85,052**	**196**	**246,300**	**250**	**86,159**	**217**	**9,590**	**239**	**10,191**	**249**
NON-POTABLE													
Residential:	Outdoor	3,167	22	50,689	117	6,512	7	16,258	41	1,520	38	3,740	91
Commercial:	Outdoor	496	4	2,815	6	2,487	3	3,232	8	10	0	0	0
Institutional:	Outdoor	1,528	11	4,399	10	3,759	4	1,925	5	1,099	27	1,073	26
Industrial:	In/Out	0	0	0	0	0	0	566	0	0	0	0	0
	Subtotal	**5,191**	**37**	**57,903**	**134**	**12,758**	**13**	**21,981**	**55**	**2,629**	**66**	**4,813**	**118**
STATEWIDE TOTALS		**41,256**	**291**	**142,955**	**330**	**259,058**	**263**	**108,140**	**273**	**12,219**	**305**	**15,004**	**367**

Notes:

1. The water use given for each hydrologic basin is calculated from data of the indicated year(s) and associated population.
2. All population figures are estimates from the Governor's Office of Planning and Budget, with the exception of the Jordan, which also took into account average US Census Bureau population numbers.
3. Statewide gpcd numbers are based on the total population of the individual basins at the given year(s) they were surveyed.

2000 COMPOSITE STATEWIDE WATER USE
Public Community Systems
(continued from previous page)

Hydrologic River Basin		Southeast Colorado		Sevier		West Desert		Cedar/Beaver		Kanab/Virgin		Statewide Total	
					Population		Population		Population		Population		Population
WATER USE CATAGORY		1996	16,466	1996	47,815	1996	29,438	1992	26,541	1997	85,535		2,009,010
		Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	AC-Ft/Yr	GPCD
POTABLE													
Residential:	Indoor	1,328	72	3,856	72	2,406	73	2,111	71	6,994	73	157,898	70
	Outdoor	1,562	85	5,318	99	2,569	78	4,395	148	12,998	136	206,500	91
	Total	2,890	157	9,174	171	4,975	151	6,506	219	19,992	209	364,398	161
Commercial:	Indoor	515	28	1,302	24	414	13	517	17	7,101	74	59,882	26
	Outdoor	129	7	325	6	103	3	129	4	1,775	19	14,970	7
	Total	644	35	1,627	30	517	16	646	22	8,876	93	74,852	33
Institutional:	Indoor	67	4	469	9	383	12	121	4	416	4	14,705	6
	Outdoor	267	14	1,877	35	1,534	47	485	16	1,662	17	58,820	26
	Total	334	18	2,346	44	1,917	58	606	20	2,078	22	73,525	32
Industrial:	**Total**	79	4	1,169	22	517	16	290	10	527	6	26,292	11
	Subtotal	**3,947**	**214**	**14,316**	**267**	**7,926**	**240**	**8,048**	**271**	**31,473**	**328**	**539,067**	**237**
NON-POTABLE													
Residential:	Outdoor	578	31	4,654	87	308	9	1,912	64	4,450	46	93,788	41
Commercial:	Outdoor	0	0	2	0	0	0	160	5	1,586	17	10,788	5
Institutional:	Outdoor	750	41	1,112	21	1,111	34	1,255	42	4,584	48	22,595	10
Industrial:	In/Out	0	0	1	0	0	0	0	0	0	0	567	0
	Subtotal	**1,328**	**72**	**5,769**	**108**	**1,419**	**43**	**3,327**	**112**	**10,620**	**111**	**127,738**	**56**
STATEWIDE TOTALS		**5,275**	**286**	**20,085**	**375**	**9,345**	**283**	**11,375**	**383**	**42,093**	**439**	**666,805**	**293**

For all of the Public Community water systems, residential uses accounted for the bulk of the water at 69% of the total. Commercial businesses accounted for 13% of the total water use. Institutional settings used 14%, while industrial applications used the remaining 4% of the total. The population that these systems serve is about 97% of the total population of the state, with the remaining population being served by private domestic water systems. The 2000 composite per capita water use of Public Community systems is 237 gallons per capita per day (gpcd) of potable and 56 gpcd of non-potable water. Therefore, the combined 2000 composite total per person water use for the state is then 293 gpcd.

For a further breakdown of water use by each of the hydrologic basins, see **Appendix A.** Detailed water use figures for each county of the state can be found in **Appendix B.** Finally, detailed tables of water use for all public water systems, both community and non-community, can be found in **Appendix C.**

Section 1
INTRODUCTION

1.1 Authority

The Utah Division of Water Resources has the overall responsibility for completing studies, investigations, and plans for the purpose of facilitating the responsible development and utilization of the water resources within the state of Utah. The *Utah State Water Plan*, prepared and distributed in1990, 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, detailed plans are prepared for each of the 11 hydrologic basins in the state. Each basin plan identifies potential conservation and development projects and describes alternatives to satisfy current and future demands. As part of this effort, other data reports have been completed for each hydrologic basin. These include water-related land use reports, water budget reports, and municipal and industrial (M&I) water use reports. This report summarizes, on a statewide basis, the M&I water use studies.

1.2 Scope

The purpose of this report is a determination of the municipal and industrial (M&I) water supplies and uses throughout the state of Utah. The data presented in this report will be used in the *Utah State Water Plan*, as well as other division reports and studies. This report summarizes the individual basin *Municipal and Industrial Water Supply Studies* reports compiled by the Division of Water Resources for each of the hydrologic basins and study areas, released between the years 1994 and 2001.

1.3 Data Collection

Because of the massive undertaking of collecting water use for every water user in Utah, it is not feasible to replicate this information on a yearly basis for each hydrologic basin. Considering this, the data collected for the *Municipal and Industrial Water Supply Studies* summarized in this report range from the years 1992 to 2000. The Statewide Summary presented at the end of this report can be considered to be representative of the year 2000.

Although the years used throughout the report are different, all the data for each basin report is based on one year's water use. Additionally, considering that county and basin boundaries do not always match, the county data presented in the Appendix may contain information from different years. For example, population data for Juab County in the Sevier River Basin was collected in 1996 while the population data of Juab County in the Utah Lake Basin was collected in 1994. When these two populations are added, the result will not be the correct total population for either year. However, due to the relatively small fluctuations of population from year to year, the population used should approximate either year, for the purposes of this report. To assist in correlating the county with the basin information, **Table 1-1** shows which of the counties fall within each of the hydrologic basins and the year of the data collected for each basin.

Table 1-1 Hydrologic Basin and County Correlation.

Hydrologic Basin	**Counties Within Basin** (Counties in **BOLD** are common to multiple basins)	**Year Data Represents**
West Desert	**Box Elder**, **Juab**, **Millard**, Tooele	1996
Bear River	**Box Elder**, Cache, Rich	1998
Weber River	**Summit**, Morgan, Weber, Davis	1992
Utah Lake	**Juab**, **Summit**, **Utah**, **Wasatch**	1993
Jordan River	Salt Lake	1999
Sevier River	**Garfield**, **Iron**, **Juab**, **Kane**, **Millard**, Piute, **Sanpete**, **Sevier**	1996
Cedar/Beaver	Beaver, **Iron**, **Washington**	1992
Uintah	Daggett, Duchesne, **Summit**, Uintah, **Wasatch**	1995
West Colorado River	Carbon, Emery, **Garfield**, **Grand**, **Kane**, **San Juan**, **Sanpete**, **Sevier**, **Utah**, Wayne	1996
Southeast Colorado River	**Garfield**, **Grand**, **Kane**, **San Juan**	1996
Kanab Creek/Virgin River	**Iron**, **Kane**, **Washington**	1997

The Utah Water Use Data Form, distributed by the Division of Water Rights, in cooperation with the Division of Water Resources and the Division of Drinking Water, is the analysis tool used for the municipal and industrial water supply study data collection.

1.4 Water System Classifications

The *Municipal and Industrial Water Supply Studies* for each basin lists water use under the following categories: Public Community Systems, Public Non-Community Systems, Private Domestic Systems, and Self-Supplied Industries. To correlate more fully with the categories provided by the Division of Drinking Water, the information of the state summary is presented in the following groups: Public Community Systems, Public Non-Community Transient Systems, and Public Non-Community Non-Transient Systems. It should be noted that the previously separate category of Self-Supplied Industry has been incorporated into the Public Non-Community Non-Transient Systems category. However, since the Private Domestic category is not currently regulated by the Division of Drinking Water, it is listed separately in this report. For a complete definition of all the categories used, see **Section 1.6** entitled Definitions of Water Terms.

1.5 Water Supply and Use Methodology

Over the past 40 years, the Division of Water Resources has utilized various procedures to obtain M&I data. In recent years, these procedures have become increasingly more comprehensive. When the division began water planning in the 1960s, available data consisted mainly of supplies and uses for the entire state. At that time, Utah's agricultural water use far exceeded M&I water use and M&I water use data was generated by multiplying estimated per capita rates by available population data.

By the early 1980s, M&I diversions made up a larger percentage of all statewide water uses and the entire water community began focusing more on M&I water supplies and uses. The Division of Water Rights began a program to collect yearly, statewide M&I data. The procedure involved mailing a survey designed to query each major public water supplier about its sources of water supply. Additionally, the United States Geological Survey (USGS) separately began M&I water use studies. The division relied on both data sources in its planning efforts by the late 1980s.

With the preparation of the *Utah State Water Plan* basin reports, the division saw the need to check and improve the quality and quantity of available data through two methods. The first method coordinated all state agency efforts to improve their M&I data collection programs. Second, the division began verifying the accuracy of the data through yearly field surveys.

1.5.1 Present Methodology for Community Water Systems

Each year, division staff members target an individual hydrologic basin or study area for M&I water supply and use analysis. As previously mentioned, the Division of Water Rights' most recent water use form is the primary analysis tool that begins the data collection process.

Division staff contact the manager or operator of each community water system to schedule a data collection and analysis meeting. At times, operators may omit information on the yearly form. During such meetings, staff members attempt to retrieve any missing data as well as obtain an overall understanding of the supplies and demands of the water system, in case estimates are necessary. A secondary objective of these meetings is to educate the operator or manager to accurately complete the water use data form. This methodology has been used since 1992 and all of the community water systems of the state have provided the necessary M&I water supply and use data.

During the analysis, division staff determines the system's detailed water supply and use. Two factors define water supply: 1) the maximum water supply available under present conditions and 2) the reliable system source capacity. The maximum water supply available under present conditions is defined as the water resources presently developed. The resources are limited by either a mechanical constraint (such as pump capacity or pipe size), a hydrologic constraint (such as reliable streamflow or groundwater safe yield) or a legal constraint (such as a water right or contract). The lesser amount of these combined constraints is considered in this study to be the maximum water supply available under present conditions. Determination of well pump capacities, spring flow estimates, treatment plant capacities, and water right information aid in the calculation of this value. 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 beyond the scope of this report.

The maximum water supply available under present conditions is an average annual volume. The reliable system source capacity is the available capacity to meet peak day demands, expressed as an annual volume. The reliable system source capacity is determined to predict future M&I water conditions for each system. For a more detailed description of calculating the reliable system source capacity and a listing for each system, please refer to the *Municipal and Industrial Water Supply Studies* for each hydrologic basin.

The last part of the data collection process is to determine the present water use for each community water system. Present water use includes developed water which is diverted into the distribution system from other sources. The data collected represents the latest available complete calendar year from when the study is started. Water use is divided into four categories: residential, commercial, institutional, and industrial. For comparative purposes the division chose these categories to correlate with the United States Geological Survey's (USGS) categories of domestic, commercial, industrial, and mining. The division's residential category is equivalent to the USGS domestic category and includes water used by residential homes, apartments, condominiums, etc. for inside and outside uses. The USGS commercial category is equivalent to the division's combined commercial and institutional categories. The commercial category includes water used for retail establishments and businesses. The institutional category includes water used for government facilities, military facilities, schools, hospitals, churches, parks, cemeteries, city operated golf courses, etc. The division's industrial category is equivalent to the combined USGS categories of industrial and mining which includes a wide variety of water uses associated with businesses that produce a specific product.

1.5.1.1 Residential Use: From the system operator, the staff collects data about the number of residential connections and the amount of water used by each of those connections. Secondary water use (pressurized irrigation and ditch systems) is estimated based on the acreage of irrigated landscape.

1.5.1.2 Commercial Use: 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 separately available or is difficult to obtain, division staff estimates the commercial water use by inventorying commercial businesses in the area and using applicable commercial water use rates. These use rates are from the Division of Drinking Water and from reports published by the Utah State Water Lab. In some rural communities where there is a relatively small number of commercial connections, the businesses are individually visited by division staff to determine their specific water use.

1.5.1.3 Institutional Use: Institutional water use is water used for government facilities, parks, golf courses, schools, hospitals, churches, military facilities, fire hydrant testing, and unaccounted losses in the water system. Because this water use is rarely metered, the process to acquire this data is tedious. The municipality is asked to provide information about city facilities such as number and size of parks, schools, churches, and golf courses. Then, the water right and/or consumptive use information for the area is used to determine the amount of water these areas would require. Additionally, once residential, commercial, and industrial use is determined, the total is subtracted from the overall total reported use. The remainder is considered to be the institutional unmetered use. This two-fold approach provides a check against misinformation and/or metering errors.

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

1.5.2 Present Methodology for Public Non-Community Water Systems

Division staff attempt to visit each non-community system. These systems rarely meter their water use, so division staff estimates their annual water use. Questions are asked to determine the types of facilities, population served, water source information, irrigation of outside areas, etc. This data, along with other water use related statistics, is used to estimate water use. The maximum water supply for these systems is often not known and is not included in this report.

Water use for self-supplied industries is acquired by using data reported on the Division of Water Rights Industrial Water Use Form. The Division of Water Rights collects annual water use data from most of the major self-supplied industrial water users in the state. This data is usually confidential, so only totals are presented herein. The maximum water supply for this category is also not included in this report.

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. The water use data for this category is acquired by subtracting the population served by public community water systems from the State Office of Budget county population data. The remainder is the population that is assumed to be served by private domestic systems. A reasonable per capita rate (usually determined from the residential per capita rates from nearby community systems) is applied to this population to determine the total water use by private domestic systems. Since the maximum water supply for private wells is really an analysis of the total groundwater reservoir/recharge area, it is not within the scope of this report.

1.5.3 Source Capacity

System source capacities are presented in two forms: maximum system source capacity, and reliable system source capacity. The maximum system source capacity depends on the constraining factors of the water system including water rights, pump limitations, hydraulic flow constraints, and treatment plant capacities. The lowest flow available with all factors considered is the maximum daily flow rate. The maximum system source capacity is equal to the continuous maximum daily flow rate (determined by the limiting constraints) over one year. The reliable system source capacity is a fraction of the maximum system source capacity and is determined by the equation below:

$$S_r = S_m U_f$$

Where:

S_r = Reliable system source capacity in acre-feet.

S_m = Maximum system source capacity in acre-feet.

$U_f = \dfrac{A_D}{2.5A_D - 49.4}$ = the use factor

A_D = Average per-capita use of the community system in gallons per day.

The use factor $\boldsymbol{U_f}$ is a function of the average per capita use and helps determine the theoretical peak water use. The reliable system source capacity is a yearly supply volume at which the peak day flow rates will not exceed the system's maximum daily flow rate. When the reliable system source capacity is divided by the current per capita use rate, the population that the water system can ultimately serve is determined. However, please note that this calculated maximum population is intended for general planning purposes only and may not be reflective of any one individual water system.

For more information on how the reliable system source capacity is determined, refer to the section "Present Methodology for Community Water Systems" in the individual hydrologic basin's *Municipal and Industrial Water Supply Studies* published by the Department of Natural Resources, Division of Water Resources.

1.6 Definitions of Water Terms

The following is some of the common water industry terminology.

1.6.1 Water Supply Terms

The general term “supply” is defined as the amount of water available. Most water supply systems are owned by a municipality, but in some cases the owner/operator is a private company or a state or federal agency. Thus, a "public" water supply may be either publicly or privately owned. Also, water systems may supply treated and/or untreated water.

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

Potable Water Supply - Water meeting all applicable safe drinking water requirements for residential, commercial, institutional, and industrial uses. Sometimes, this water is referred to as the culinary or municipal water supply.

Non-Potable Water Supply - Water not meeting all applicable safe drinking water requirements. Secondary irrigation companies and self-supplied industries usually supply this type of water. This water is usually referred to as secondary water. It also can be called non-culinary water.

Secondary Water Supply - Pressurized or open ditch water systems that supply untreated water for irrigation of privately and publicly owned lawns, gardens, parks, cemeteries, golf courses, and other open areas. These systems, sometimes called "dual" water systems, are installed to provide an alternative to irrigating outdoor areas with culinary water. This supply is often provided by irrigation companies. Self-supplied industries can also use secondary water for industrial processes.

Public Community Water Supply - Includes potable water supplied by either a privately or publicly owned community system which serves at least 15 service connections or 25 individuals year-round. Water from public community supplies may be used for residential, commercial, institutional, and/or industrial purposes. This can include indoor and outdoor uses.

Public Non-Community Water Supply - Includes potable water supplied by either a privately or publicly owned system 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 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 combines transient and non-transient systems as simply public non-community systems. Although industries with their own water supply are technically a non-community system, for this report they are considered to be self-supplied industries.

Self-supplied Industrial Supply - Includes potable and/or non-potable water supplied by individual privately owned industries usually from their own wells or springs.

Maximum Water Supply Available Under Present Conditions - The annual volume of water which is the lesser of the hydrologic capacity of the water source, the physical capacity of the water system, or the use allowed by the water rights.

Reliable System Source Capacity - The actual amount of the maximum water supply that is available to meet peak demands. When this number is divided by the average per capita usage, the resulting number estimates the maximum population that the water source can serve. (See Figure 4)

Private-Domestic Supply - Includes water supplied from goundwater aquifers to private wells or springs for use in individual homes, usually in rural areas not accessible to public water supply systems.

1.6.2 Water Use Terms

Water is used in a variety of ways and for many purposes. Water is often said to be "used" when it is diverted, demanded, withdrawn, depleted, or consumed. But it is also "used" for fish and wildlife habitat, recreation, and hydro power production. In this report, the word *use* refers to diverted or withdrawn amounts of water. The word *use* can be inserted where the word *supply* is written in most of the previous water supply terms to define the water demand associated with those definitions. Some additional water use terms are as follows:

Residential Use - Water use associated with residential cooking; drinking water; washing clothes; miscellaneous cleaning; personal grooming and sanitation; irrigation of lawns, gardens and landscapes, and maintenance of other outside facilities. Single family homes, apartments, duplexes, and condominiums are some examples.

Commercial Use - Uses normally associated with small business operations which may include drinking water, food preparation, personal sanitation, facility cleaning and maintenance, and irrigation of facility landscapes. Retail businesses, restaurants, hotels, and privately owned golf courses are some examples.

Institutional Use - Uses normally associated with general operation of various public agencies and institutions including drinking water, personal sanitation, facility cleaning and maintenance, parks, cemeteries, playgrounds, recreational areas, municipal golf courses, and irrigation of facility landscapes. Often times, the amount of water used by these facilities is not metered.

Industrial Use - Uses 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. Manufacturing plants, oil and gas producers, mining companies, mink farms, dairies, and small businesses producing products are examples.

1.6.3 Other Water Terms

Consumption - Water evaporated, transpired, or irreversibly bound in either a physical, chemical, or biological process.

Consumptive Use - Water use that permanently withdraws from its source; water that is no longer available because it has evaporated, been transpired by plants, incorporated into products or crops, consumed by people or livestock, or otherwise removed from the immediate water environment.

Depletion - Water consumed within a service area and thus no longer available as a source of supply; the withdrawal of water from a stream or groundwater aquifer at a rate that exceeds the rate of replenishment; in relation to irrigation or municipal water uses, depletion is the diversion at the head gate or wellhead minus the flow returned to the same stream or aquifer. The terms consumptive use and depletion, often used interchangeably, are not the same. For example, water exported from a basin is depletion to the basin system but is not consumptively used in the basin. The exported water is available for use in another system. Precipitation that falls on irrigated crops is not considered a part of the supply as surface water and groundwater diversions are. For this reason, precipitation falling on and consumed by irrigated crops is not considered as being a depletion to the system.

Diversion - Water diverted from supply sources such as streams, lakes, reservoirs, or groundwater aquifers for municipal and industrial uses and occasionally environmental purposes. The terms diversion and withdrawal are often used interchangeably.

Withdrawal - See definition for *diversion*. However, this term is normally used in association with water diverted from a groundwater source.

Section 2
MUNICIPAL AND INDUSTRIAL WATER USE BY HYDROLOGIC BASIN

2.1 Basin Delineation

The state of Utah is divided into 11 hydrologic basins. With the large population concentration of the Jordan River Basin , it is reported as the Utah Lake and Jordan River Basins. Additionally, please note that the names of the basins may slightly differ from the 1990 *Utah State Water Plan.* When there is a difference, the *Utah State Water Plan* name is indicated in parentheses after the basin names in the subsection heading. **Figure 2-1** shows the boundaries of each hydrologic basin of this report.

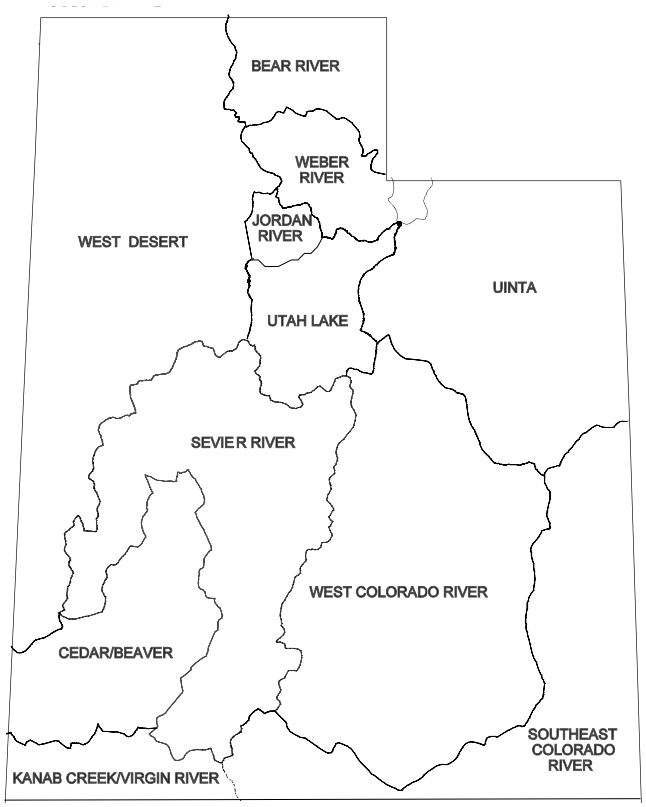


Figure 2-1 Hydrologic Basins of Utah

Each of the following sections contain a brief physical description of the basin, a discussion of the maximum potable water supplies for all public community systems within the basin, and the water use breakdown for the entire basin including public community, public non-community, and private domestic systems use. Also, a table is provided showing the per-capita use rates for the public community systems within the basin. Water supply data for the non-community systems and private domestic systems is beyond the scope of this report. Since non-community systems are generally self supplied, it is assumed that these self-operated systems were sized to meet the demand. For further information on the data contained within this report, please refer to the individual basins *Municipal and Industrial Water Supply Studies*, published by and made available through the Division of Water Resources. Water use, by county, is shown in **Appendix B** of this report. It should be noted, however, that the water use data presented herein was collected over a period of years. Therefore, the data represented within any one of the county boundaries may contain figures from different years. For a complete listing of the years that data was collected and which counties are within differing basins please refer to **Table 1-1** on page 2 of this report.

2.2 West Desert Basin (Columbia River and Great Salt Lake Desert Basins)
(Data collected from calender year 1996)

The West Desert Basin covers about 18,000 square miles of the western portion of Utah. Roughly three quarters of the Utah/Nevada state line form the western boundary of the basin in Utah. The crest of the Raft River Mountains coupled with the Utah/Idaho state line form the basin's northern boundary. Features such as the Promontory Mountains, Great Salt Lake, Oquirrh Mountains, Wah Wah Mountains, and smaller mountain ranges form the east and southeastern boundaries. See **Figure 2-1** for an illustration of the basin boundaries within Utah.

The basin spans all or part of nine counties in Utah: Beaver, Box Elder, Davis, Iron, Juab, Millard, Salt Lake, Tooele, and Weber. The area is characterized by small north/south trending mountain ranges separated by large areas of low-lying desert.

2.2.1 Basin Water Use

Of the total combined water use of 24,122 acre-feet in the basin, the single largest categorical use of 14,071 acre-feet is from self-supplied industries in Tooele County. Classified as non-community non-transient water systems by the Division of Drinking Water, specific users include Aptus, Barrick Resources, Cargill Salt, Chemical Lime Co., Envirocare of Utah, Laidlaw Environmental, Magnesium Corporation of America, Morton International, and Reilly Industries. This industrial process water accounts for 58 percent of all water use in the basin. Additionally, 170,961 acre-feet of saline water (not included in use numbers) is used by some of these industries.

In contrast, the total water delivered by public community water systems totals 9,346 acre-feet or 39 percent of the basin water use. The 16 public community water systems serve 29,438 people (about 95 percent of the 30,820 total population within the basin). See **Figure 2-2** for locations of the public community water systems within the basins. The 18 public non-community water systems serve areas such as the Tooele Army Depot and Proving Grounds, Great Salt Lake Marina (state facility), truck stops, isolated schools and churches, roadside rest areas, and one unregulated Native American water system. Please refer to the Appendix for more detail of water usage by water and system type for the hydrologic basins and the counties of the basins. The following **Table 2-1** is a summary of water use in the basin:

Table 2-1 Water Use of the West Desert Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	7,927	1,419	9,346
PUBLIC NON-COMMUNITY TRANSIENT	180	0	180
PUBLIC NON-COMMUNITY NON-TRANSIENT	14,068	3 *	14,071
PRIVATE DOMESTIC	525	0	525
TOTALS (Ac-Ft/Year)	22,700	1,422	24,122

*An additional 170,961 acre-feet of saline water used in Tooele county for industrial purposes is not included in this figure.

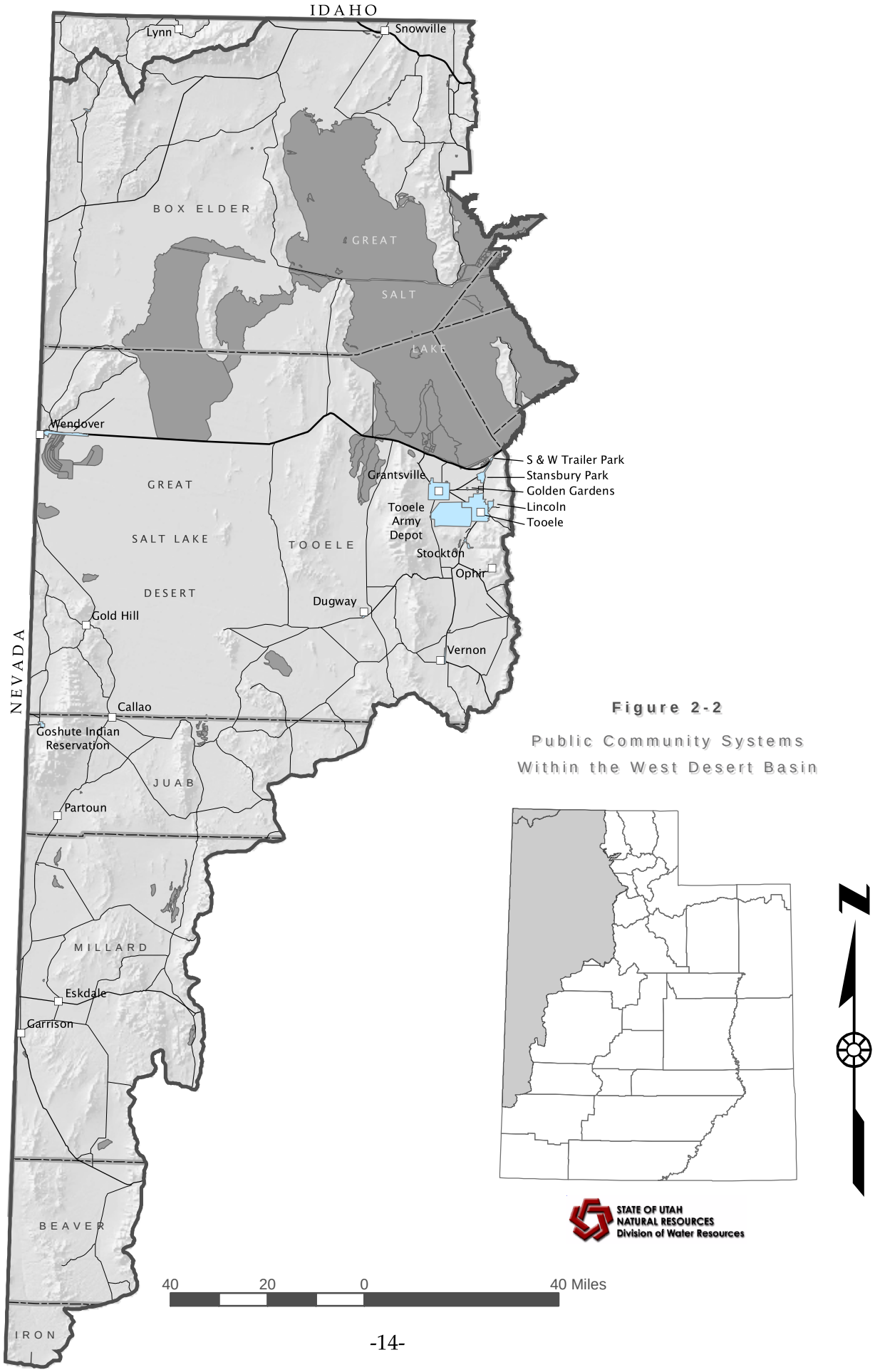


Figure 2-2

Public Community Systems
Within the West Desert Basin

2.2.2. Public Community Water Systems - Source of Supply

Potable water for Public Community Water Systems in the West Desert Basin is supplied from groundwater aquifers either naturally through springs, or mechanically with the use of wells. **Figure 2-3** illustrates the maximum annual water supply for all public community systems in the West Desert Basin by source.

Maximum supply indicates how much water is available for use through source capacities limited by water rights, hydrologic, and/or systematic constraints. The maximum supply currently available to public community systems within the West Desert Basin is 25,828 acre-feet. The reliable systems source capacity for public community systems is 12,188 acre-feet. Currently, no surface water is used as a potable water source. Economical constraints of treating surface water and the availability of higher quality groundwater are the primary reasons for this use pattern.

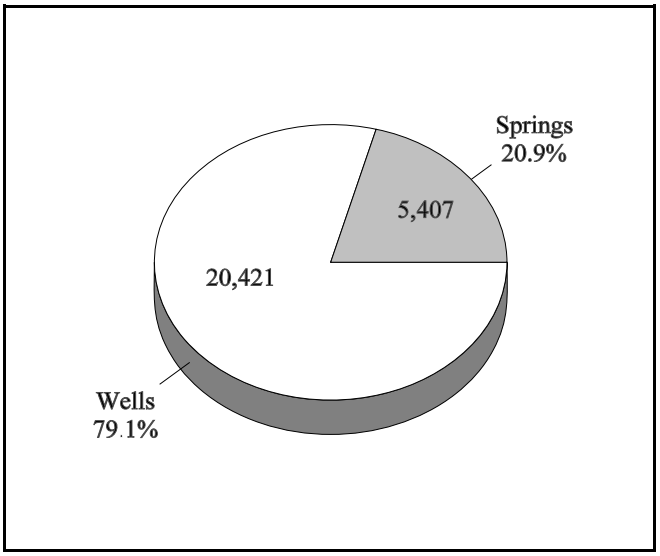


Figure 2-3. Maximum Potable Supply for Public Community Water Systems (values in acre-feet).

2.2.3 Public Community Water Systems - Water Use

The public community water systems serve water to the majority of the population, as well as to institutional, commercial, and industries other than those previously mentioned. **Table 2-2** shows the categorical total water use and per-capita water use rates for public community systems within the West Desert Basin. The non-potable water use indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates industrial water supplied only by public community systems and does not include the water used by non-community non-transient systems. **Figure 2-4** graphically illustrates the data of **Table 2-2** for potable and non-potable water use.

For a more detailed description of water use by individual water users, please refer to the report: *Municipal and Industrial Water Supply and Uses in the Columbia and Great Salt Lake Desert Basins*, July 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-2 Total and Per-capita Water Use of Public Community Water Systems Within the West Desert Basin (pop. 29,438, circa 1996)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-ft)	Rate (GPCD)
Potable Water		
Residential Use:	4,975.4	151
Commercial Use:	517.0	16
Institutional Use:	1,917.0	58
Industrial Use:	517.3	16
Sub Total	**7,926.7**	**240**
Non-Potable Water		
Residential Use:	308.3	9
Commercial Use:	0.0	0
Institutional Use:	1,111.0	34
Industrial Use:	0.0	0
Sub Total	**1,419.3**	**43**
TOTAL	**9,346.0**	**283**

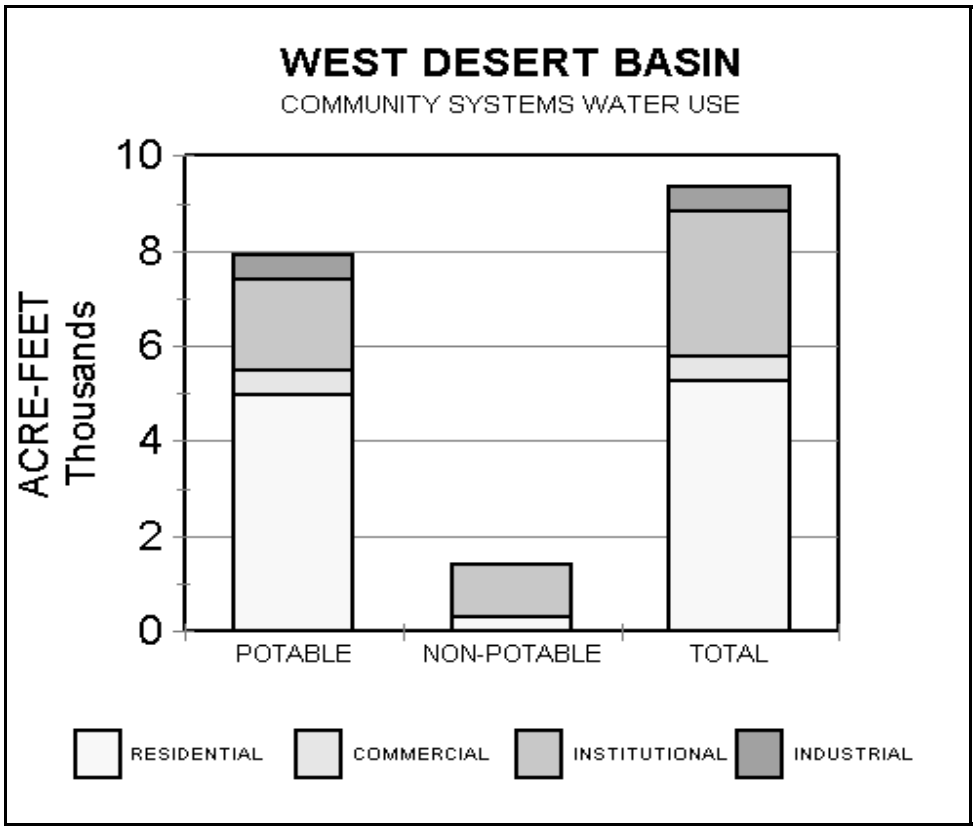


Figure 2-4 Public Community Systems Categorical Water Use
Note: Each graph scale varies - compare values only.

2.3 Bear River Basin
(Data Collected from calender year 1998)

The Bear River Basin covers large portions of Idaho, Wyoming, and Utah. Utah claims approximately 2,163,000 acres of the Bear River Basin spanning parts of Box Elder, Cache, Summit, and Rich counties. The Utah portion of the basin is bordered on the north by the Utah/Idaho state line and on the east by the Utah/Wyoming state line. The Promontory Mountains largely form the western boundary, while Box Elder, Cache, and Rich counties lines largely comprise the basin's southern boundary.

The Bear River Basin in Utah encompasses all or part of four Utah counties: Box Elder, Cache, Rich, and Summit. See **Figure 2-1** for an illustration of the basin boundaries in Utah.

2.3.1 Basin Water Use

Within the Bear River Basin of Utah, 49,838 acre-feet of water is used annually. The majority of the water used is potable water, with 7,201 acre-feet of non-potable water currently being utilized. Total water use is increasing substantially with growing recreational use around Bear Lake and population growth, particularly in the Brigham City and Logan areas. Utah State University in Logan is the single largest institutional user of water at nearly 2,000 acre-feet annually. Due to this increasing water use, the *Cache Valley Ground Water Management Plan of 1999* was enacted. This plan, working in conjunction with the Bear River Compact of 1958 (amended 1980), outlines the future appropriations and possible uses of the available water resources.

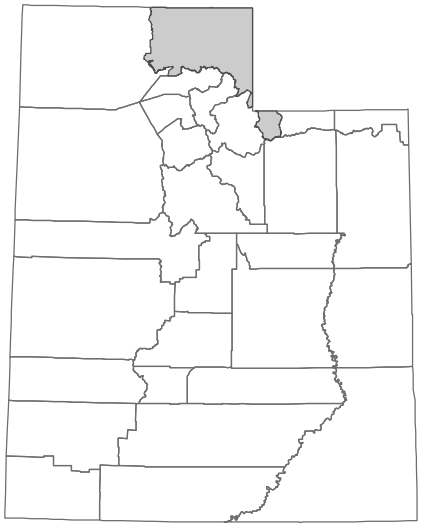
The Bear River Basin currently has 56 public community water systems. These systems serve 126,418 people (about 97 percent of the 130,352 total population within the basin).See **Figure 2-5** for locations of the public community water systems within the basin. This basin also has 55 public non-community systems serving state parks, including the Great Salt Lake Marina State Park, campgrounds, isolated commercial establishments, roadside rest stops, and self-supplied industries. Refer to the Appendix for more complete details of water usage by water and system type for the hydrologic basins and the counties of the state. The following **Table 2-3** summarizes the water use in the basin.

Table 2-3 Water Use of the Bear River Basin
(Figures may not add to totals due to independent rounding.)

PUBLIC WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
COMMUNITY	36,064	5,191	41,255
NON-COMMUNITY TRANSIENT	324	126	450
NON-COMMUNITY NON-TRANSIENT	2,749	1,883	4,632
PRIVATE DOMESTIC	3,500	0	3,500
TOTALS (Ac-Ft/Year)	42,637	7,201	49,838

Figure 2-5

Public Community Systems Within the Bear River Basin



STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources

20 10 0 20 Miles

2.3.2 Public Community Systems - Source of Supply

Potable water for the public community systems in the Bear River Basin is supplied from mostly groundwater aquifers either naturally through springs, or mechanically with the use of wells. **Figure 2-6** illustrates the maximum annual potable water supply for all public community systems in the Bear River Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints. The maximum supply currently available to public community systems within the Bear River Basin is 128,359 acre-feet. The reliable systems source capacity for public community systems is 60,524 acre-feet. Only North Logan currently uses surface water as a potable water source. Economical constraints of treating surface water and an abundance of high quality groundwater are the primary reasons for not utilizing more surface water as a potable water source.

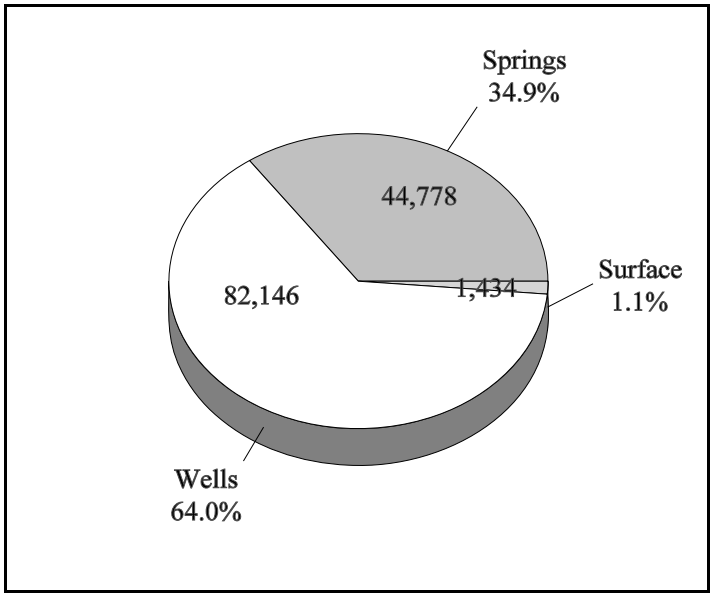


Figure 2-6 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.3.3 Public Community Water Systems - Water Use

Though residential applications are the main use of water supplied by the public community systems, some of the small systems report a large use of water for dairy and stockwatering operations. These operations are classified as industrial water use. Rich county is the home of small rural communities that have a large increase in summer population due to tourists. Furthermore, some towns in the Bear Lake area have extremely cold winter months which lead to the practice of continuously running water through the system to eliminate pipe freezing problems. These two challenges result in inflated residential water use numbers among some of the public community water systems in Rich County.

Though potable water is used for indoor and outdoor applications, some communities have secondary water systems, for outdoor irrigation, within the municipal boundaries. Many of these systems are open ditch systems that are serviced by independent irrigation companies. In calculating usage of these irrigation systems, it was assumed that flood irrigation was used for lawn and garden irrigation only to supplement typical lawn sprinkling throughout the week.

For comparative purposes, **Table 2-2** shows the total and the per-capita water use rates for public communities within the Bear River Basin. The non-potable water use indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates industrial water supplied only by the public community systems

and does not include the water used by non-community non transient systems. **Figure 2-7** graphically illustrates the data of **Table 2-4**.

For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Bear River Basin*, February 2001, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-4 Total and Per-capita Water Use of Public Community Water Systems Within the Bear River Basin (population 126,418, circa 1999)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	25,904.2	183
Commercial Use:	3,922.7	28
Institutional Use:	2,524.6	18
Industrial Use:	3,712.6	26
Sub Total	**36,064.1**	**255**
Non-potable Water		
Residential Use:	3,166.7	22
Commercial Use:	496.4	4
Institutional Use:	1,528.2	11
Industrial Use:	0.0	0
Sub Total	**5,191.3**	**37**
TOTAL	**41,255.4**	**291**

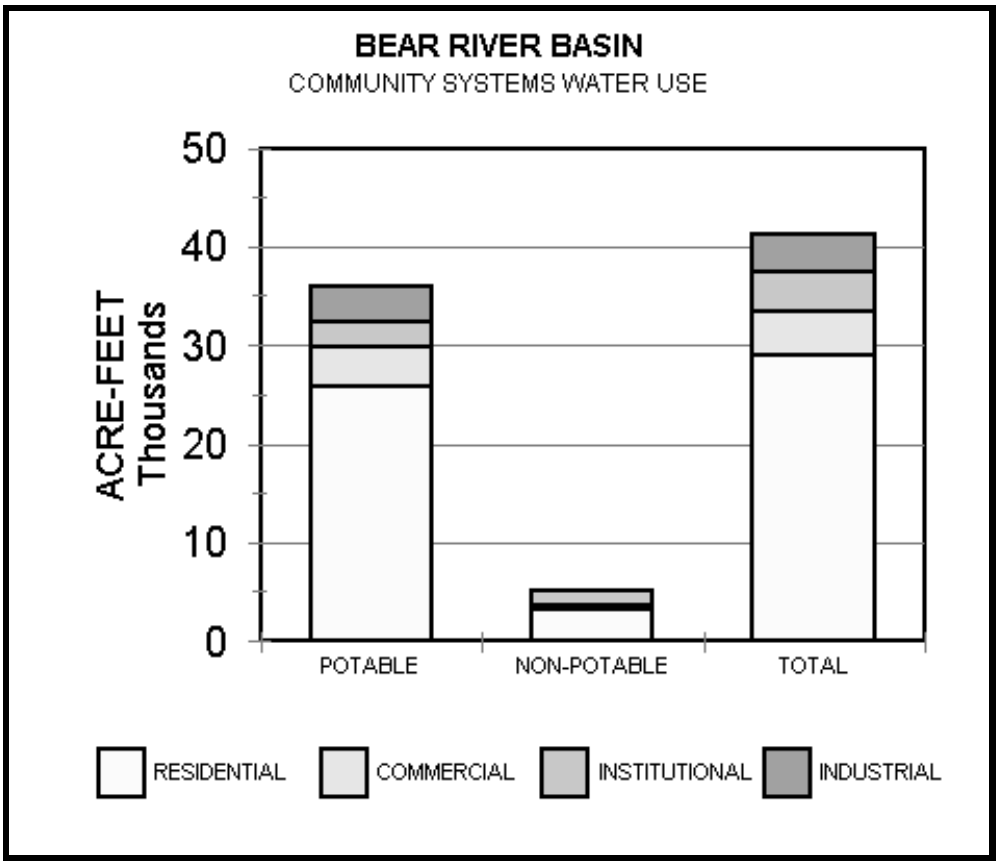


Figure 2-7 Public Community Systems Categorical Water Use
Note: Each section's graph scale varies - compare values only.

2.4 Weber River Basin
(Data collected from calender year 1992)

The Weber River Basin covers about 1,955 square miles of land, including the Upper Ogden River watershed above Pineview Reservoir. Within the basin the Wasatch Mountains run from the southern to northern boundaries, rising in places to over 11,000 feet above sea level. The southern boundary is basically Salt Lake and Wasatch County borders, while the northern boundary follows the borders of Weber, Morgan, and Summit counties. The basin extends from the Great Salt Lake at its western edge to the Unita Mountains in the east, spanning all or part of four counties: Morgan, Summit, Weber, and Davis. See **Figure 2-1** for an illustration of the basin boundaries within Utah.

The Weber River Basin is currently experiencing rapid growth. Agricultural land is being replaced by new residential areas, causing water to be converted from agricultural to municipal use. Davis County is rapidly urbanizing, particularly in the areas adjacent to the Salt Lake City metropolitan area. Additionally, the Park City area has seen population growth rates nearly double the basin and/or state average.

2.4.1 Basin Water Use

The total combined water use in the basin is 169,787 acre-feet, of which 91,523 acre-feet is potable water. With urbanization, secondary (non-potable) water is now being utilized for irrigation of parks, golf courses, and residential landscaping instead of pasture and farmland. The increasing recreational use of areas within the basin has dramatically increased the demand for water in summer home developments, campgrounds, isolated commercial establishments, small subdivisions, and other recreational sites.

The Weber River Basin currently has 78 public community water systems. These systems serve approximately 387,000 people (about 97 percent of total population within the basin). See **Figure 2-8** for location of the public community water systems within the basin. The basin also has over 60 public non-community systems serving the wide variety of uses. Please refer to the Appendix for more complete detail of water usage by water and system type for the hydrologic basins and the counties of the state. The following **Table 2-5** summarizes the overall water use in the basin.

Table 2-5 Water Use of the Weber River Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	85,052	57,904	142,955
PUBLIC NON-COMMUNITY TRANSIENT	323	206	529
PUBLIC NON-COMMUNITY NON-TRANSIENT	3,038	20,155 *	23,193
PRIVATE DOMESTIC	3,109	0	3,109
TOTALS (Ac-Ft/Year)	91,523	78,264	169,787

*An additional 80,000 acre-feet of saline water used in Weber county for industrial purposes is not included in this figure.

Figure 2-8

Public Community Systems Within the Weber River Basin

2.4.2 Public Community Systems - Source of Supply

Potable water for public community water systems in the Weber River Basin is supplied from surface water storage facilities (reservoirs) and/or groundwater supplies through natural springs or pumped wells. **Figure 2-9** illustrates the maximum annual water supply for all public community systems in the Weber River Basin. Maximum supply indicates how much water is available for use. All values represent the maximum system source capacities limited by water rights, hydrologic, and/or system constraints.

The maximum supply currently available to public community systems within the Weber River Basin is 251,076 acre-feet. The reliable systems source capacity for public community water systems is 178,485 acre-feet.

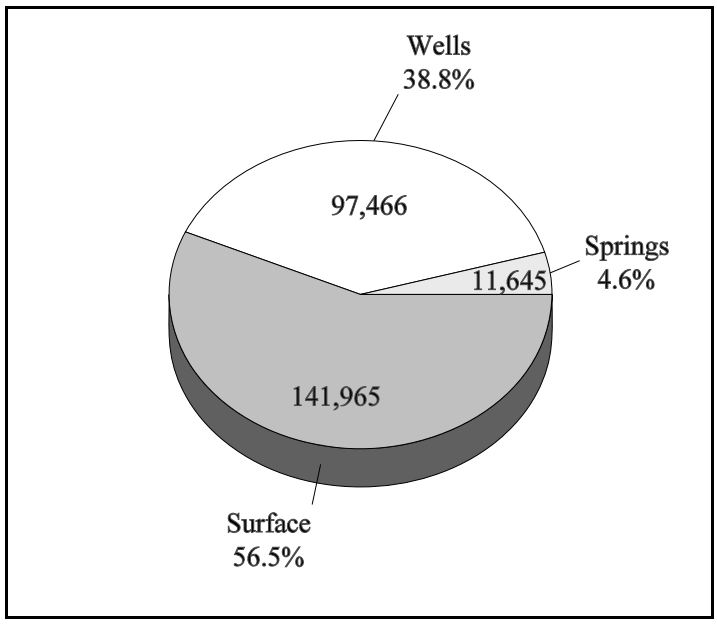


Figure 2-9 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.4.3 Public Community Water Systems - Water Use

Residential water accounts for the major use of water within the public community water systems of the Weber River Basin. The majority of water used within these public community systems is non-potable water for outdoor irrigation and supplied by Weber Basin Water Conservancy District (WBWCD) and other entities. More expensive potable water is reserved for indoor use. Non-potable industrial use is the next highest use category. This water is used by the non-community non-transient systems (self-supplied industries).

The following **Table 2-6** shows the categorical total water use and per-capita water use rates for public community systems within the basin. The non-potable water use indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates industrial water supplied only by public community systems and does not include the water used by non-community non-transient systems. **Figure 2-10** graphically illustrates the data of **Table 2-6**.

For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Weber River Basin*, July 1996, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-6 Total and Per-capita Water Use of Public Community Water Systems Within the Weber River Basin (pop. 387,112, circa 1992)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	49,505.6	114
Commercial Use:	11,767.4	27
Institutional Use:	21,097.4	49
Industrial Use:	2,681.6	6
Sub Total	**85,052.0**	**196**
Non-potable Water		
Residential Use:	50,689.5	117
Commercial Use:	2,814.8	6
Institutional Use:	4,399.2	10
Industrial Use:	0.0	0
Sub Total	**57,903.5**	**134**
TOTAL	**142,955.5**	**330**

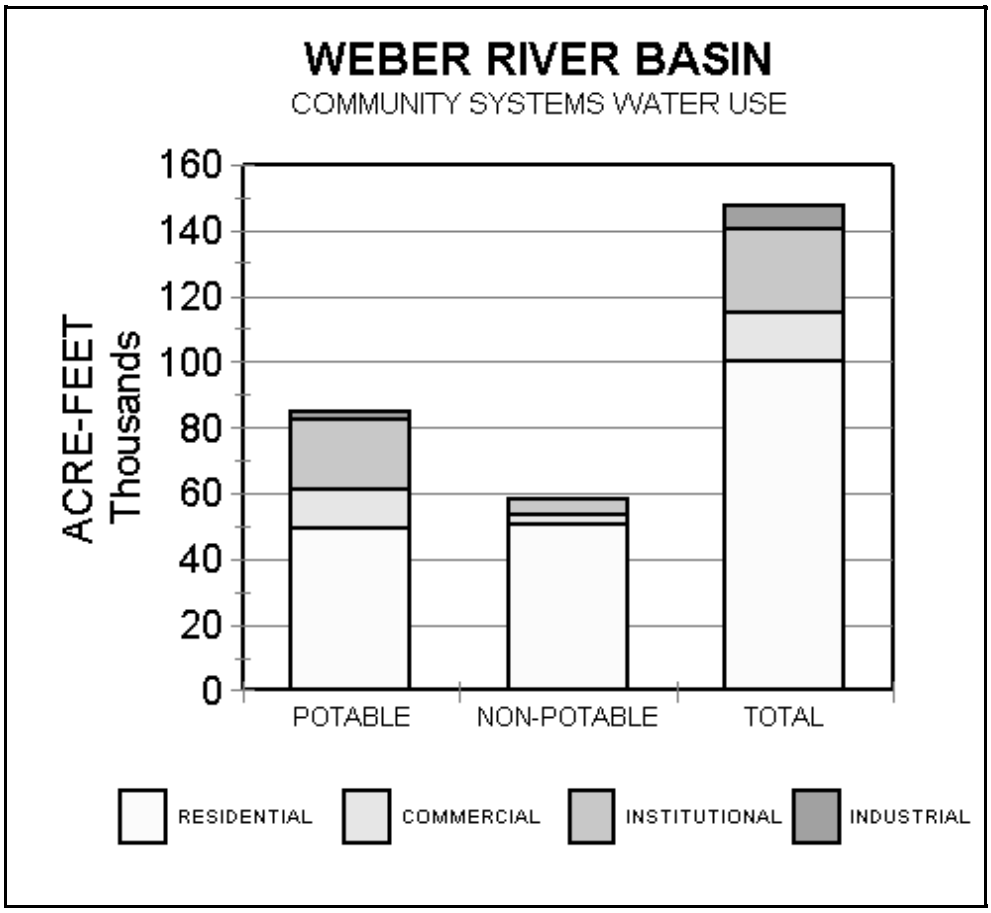


Figure 2-10 Public Community Systems Categorical Water Use
Note: Each graph scale varies - compare values only.

2.5 Utah Lake Basin (Jordan River Basin)

(Data collected from calender years 1993 and 1999)

Due to the population density of the Jordan River Basin, the M&I data is separately reported as two separate basins, namely the Utah Lake Basin and the Jordan River Basin (Section 2.6). The Utah Lake Basin covers about 3,040 square miles of the north central portion of Utah and makes up the majority of the Utah Lake Drainage Study Area. The area is bounded on all sides by a series of mountain ranges including the Traverse Mountains to the north, the Wasatch Mountains to the east, the Mount Nebo Wilderness Area to the south and the Oquirrh Mountains to the west. Elevations of the area range from 11,877 feet at Mount Nebo to 4,488 feet at Utah Lake.

The Utah Lake Basin spans all or part of five counties: Utah, Wasatch, Summit, Juab and Sanpete. The Sanpete County portion of the area contains no significant water users and reflects no water use in this report. The Utah Lake Basin is one of the more densely populated and developed areas in the state, behind only the Jordan River Basin and the Weber River Basin. See **Figure 2-1** for an illustration of the area boundaries in Utah.

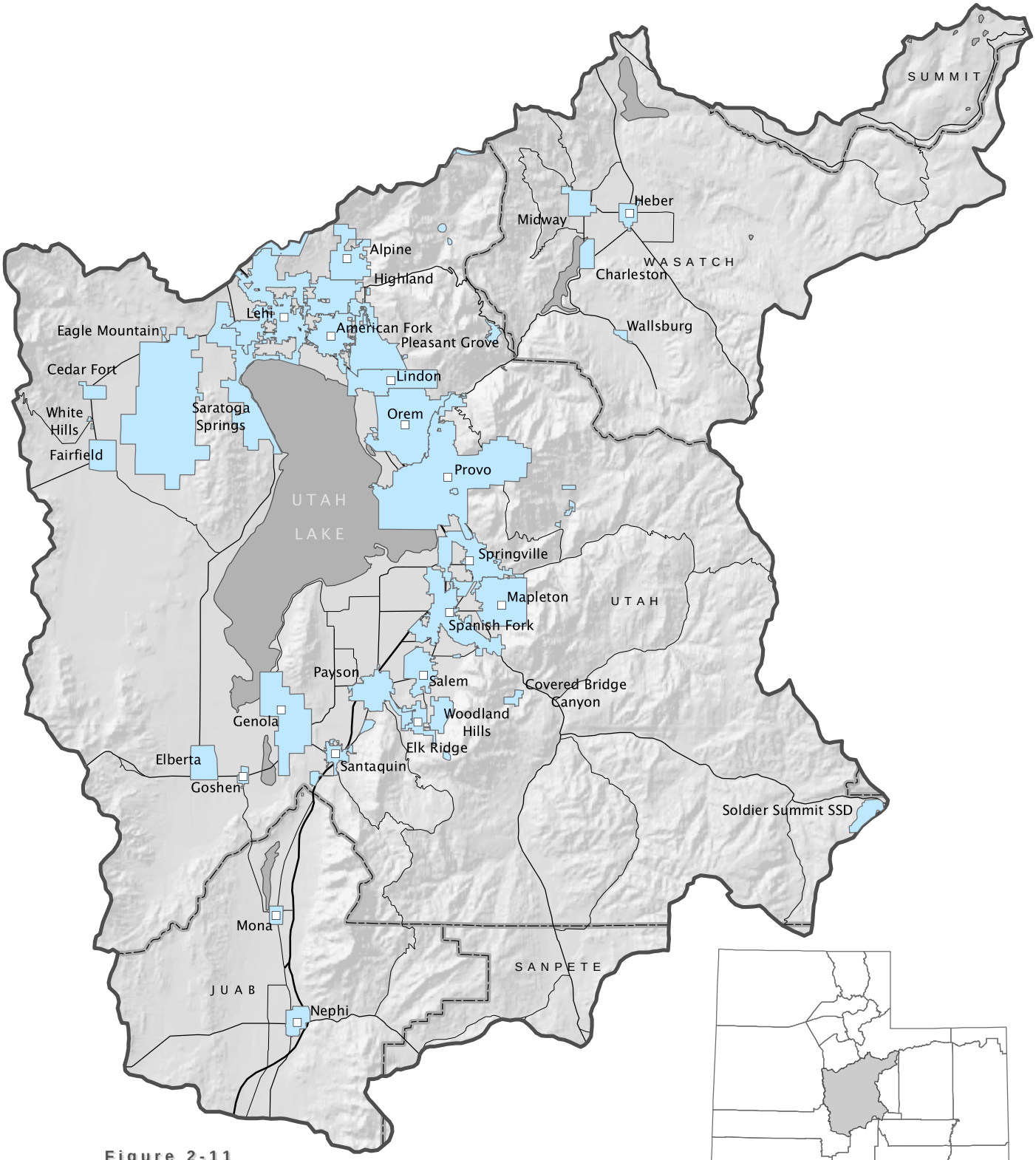
2.5.1 Area Water Use

Total annual water use in this area is 138,407 acre-feet. The majority of use is of potable water, with 22,731 acre-feet of non-potable water currently being utilized. Some of this non-potable water is supplied by several irrigation companies and is utilized by residential developments for landscape irrigation. Because the area is experiencing some of the highest population growth rates in the state, total residential water use has been increasing at a substantial rate.

Within the area, there are 49 public community water systems serving nearly 300,000 people. See **Figure 2-11** for location of the public community water systems within the study area. More than 50 public non-community water systems serve such facilities as Timpanogos Cave National Monument; state parks including: Utah Lake, Jordanelle, Deer Creek, and Wasatch Mountain; campgrounds in the Wasatch, Ashley, and Uintah national forests; isolated commercial establishments; self-supplied industries; and road rest stops. Refer to the Appendix for complete details of water use by water and system types for all hydrologic basins and counties in the state. The following **Table 2-7** summarizes water use in the basin.

Table 2-7 Water Use of the Utah Lake Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	86,159	21,981	108,141
PUBLIC NON-COMMUNITY TRANSIENT	142	750	892
PUBLIC NON-COMMUNITY NON-TRANSIENT	26,739	0	26,739
PRIVATE DOMESTIC	2,636	0	2,636
TOTALS (Ac-Ft/Year)	115,676	22,731	138,407



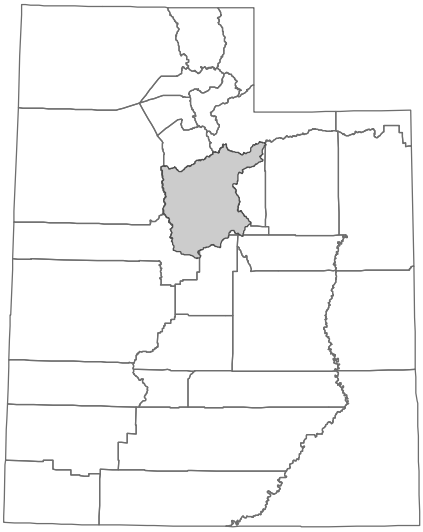


Figure 2-11

Public Community Systems Within the Utah Lake Basin

20 10 0 20 Miles

STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources

2.5.2 Public Community Systems - Source of Supply

Potable water for public community water systems in the Utah Lake Basin is supplied from groundwater aquifers and surface runoff. **Figure 2-12** illustrates the maximum annual water supply for all public community systems in the Utah Lake Basin.

Maximum supply indicates how much water is available for use. All values represent the source capacities, limited by water rights, hydrologic and/or system constraints. The maximum supply available to public community systems within the Utah Lake Basin is 236,399 acre-feet. The reliable systems source capacity for public community systems is 116,268 acre-feet. Much of the surface water within the area boundaries is transported to the Jordan River Basin for use in Salt Lake County.

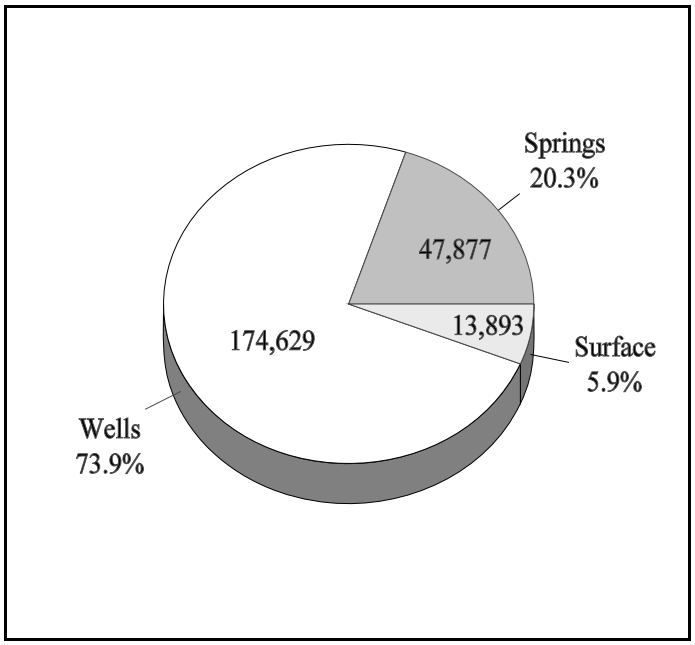


Figure 2-12 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.5.3 Public Community Water Systems - Water Use

Public community systems account for the majority of water used within the area. Potable water is used extensively indoors and outdoors throughout the area with only a few systems providing secondary water for irrigation along the Wasatch Front. **Table 2-4** details the total and per-capita water use for public community water systems within the Utah Lake Basin. Please note that the non-potable water use value is based on water that secondary irrigation systems supply within the public community water systems boundaries. The industrial use category indicates only industrial water that is supplied by the public community systems.

The town of Eureka is not located within the study area but maintains wells within the boundaries of the Utah Lake Basin. These withdrawals are not reflected in this section's tables and figures. Please refer to the Sevier River Basin section for the water use of Eureka. Furthermore, water use by the community of Vinyard (population estimated at 162) is not included in the **Table 2-4**. The water system serving Vinyard also serves the Geneva Steel Plant, in Utah County, which is classified as a non-community non-transient water supply system. Because of the relatively large industrial water use, the resultant numbers would have misrepresented the overall public community system use within the study area.

Figure 2-13 graphically illustrates the data of **Table 2-4**. For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Utah & East Juab Counties Area* reports of July 1995 and 2000, by Hansen Allen & Luce, Inc. for the Utah Department of Natural Resources, Division of Water Resources.

Table 2-8 Total and Per-capita Water Use of Public Community Water Systems Within the Utah Lake Basin (pop. 298,655, circa 1999)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	57,080.5	144
Commercial Use:	9,621.2	24
Institutional Use:	14,272.7	36
Industrial Use:	5,184.9	13
Sub Total	**86,159.4**	**217**
Non-potable Water		
Residential Use:	16,257.9	41
Commercial Use:	3,232.3	8
Institutional Use:	1,925.3	5
Industrial Use:	565.6	1
Sub Total	**21,981.1**	**55**
TOTAL	**108,140.5**	**273**

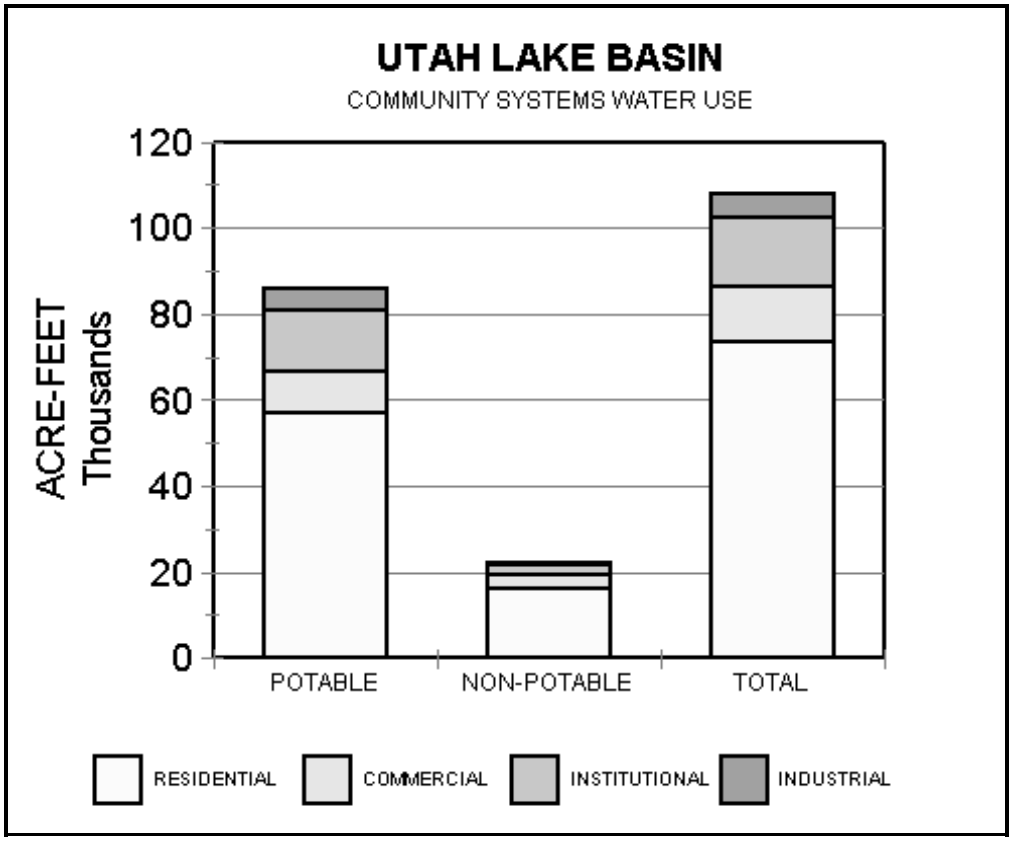


Figure 2-13 Public Community Systems Categorical Water Use
Note: Each section's graph scale varies - compare values only.

2.6 Jordan River Basin
(Data collected from calender year 1999)

The Jordan River Basin covers about 3,800 square miles of the north-central portion of Utah. The boundaries of the basin consist of the Traverse Mountains on the south, the Wasatch Mountains on the east, the Great Salt Lake on the north and the Oquirrh Mountains on the west. Elevations within the basin range from approximately 4,200 feet at the shores of the Great Salt Lake to over 11,000 feet above sea level at the top of Twin Peaks in the Wasatch Mountains. The area entirely encompasses Salt Lake County, the most populated and developed county of the state. See **Figure 2-1** for an illustration of the basin boundaries within Utah.

2.6.1 Area Water Use

With total water use of 272,985 acre-feet per year, this basin has the highest total M&I water use in Utah. Potable water use is the vast majority of water type used. Non-potable water use within this area is 17,184 acre-feet (residential and industrial only). Due to the metropolitan nature of the area, there is substantial water use in all categories, including residential, commercial, institutional, and industrial. The area encompasses not only the capital city of Salt Lake City, but also two of the larger cities in the state, Sandy City and West Valley City. With several other incorporated cities, as well as a large population in unincorporated areas, there is a large amount and variety of water use.

Over the last two decades, agricultural water use has steadily declined as urban water use has increased at an even greater rate. This has required a more rigorous accounting of general water use and the management of all water resources. However, due to the many complex agreements, exchanges, and management plans of the area, discussion of water rights and their uses are beyond the scope of this report.

The Jordan River Basin currently has 33 public community water systems. See the following **Figure 2-14** for locations of the public community water systems within the basin. These systems serve about 879,850 people. Refer to the Appendix for complete details of the usage by water and system type for this and all other hydrologic basins. The following **Table 2-9** is a summary of the water use in the Jordan River Basin.

Table 2-9 Water Use of the Jordan River Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	246,299	12,758	259,057
PUBLIC NON-COMMUNITY TRANSIENT	311	783	1,094
PUBLIC NON-COMMUNITY NON-TRANSIENT	9,191	3,643	12,835
PRIVATE DOMESTIC	4,500	0	4,500
TOTALS (Ac-Ft/Year)	260,301	17,184	277,485

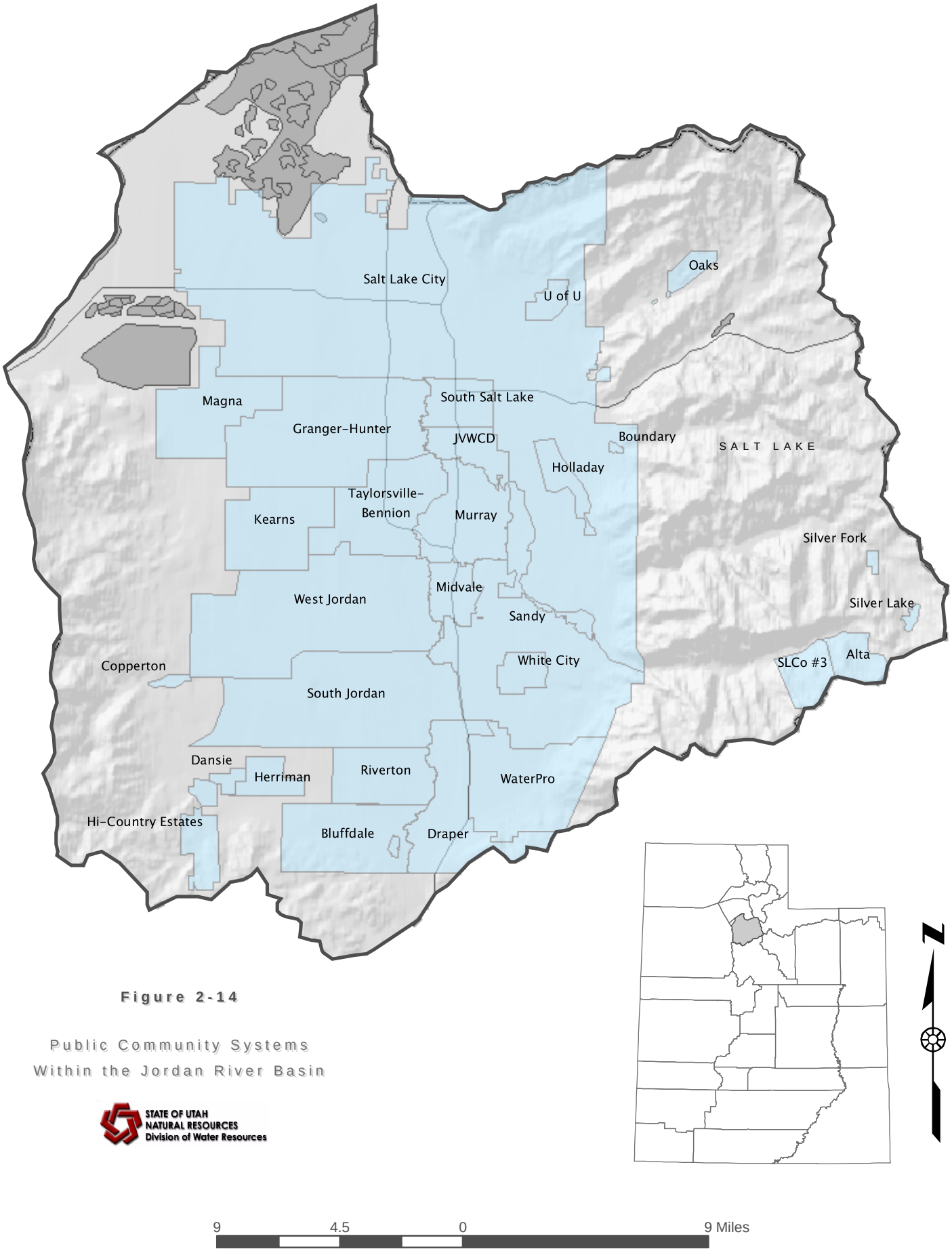


Figure 2-14

Public Community Systems
Within the Jordan River Basin

STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources

2.6.2 Public Community Water Systems - Source of Supply

Less than half of the potable water in the Jordan River Basin is supplied by surface water runoff which is treated at eight different water treatment plants within the area before use. The larger source of water comes from wells and springs. Almost 70 percent of the surface water used within the Jordan River Basin is supplied from the Utah Lake Basin through extensive pipelines and canal systems. The major sources of imported water include the Welby-Jacob Exchange (29,400 ac-ft.), the Central Utah Project (70,000-84,000 ac-ft.), and Deer Creek and Jordanelle reservoirs (61,700 ac-ft.).

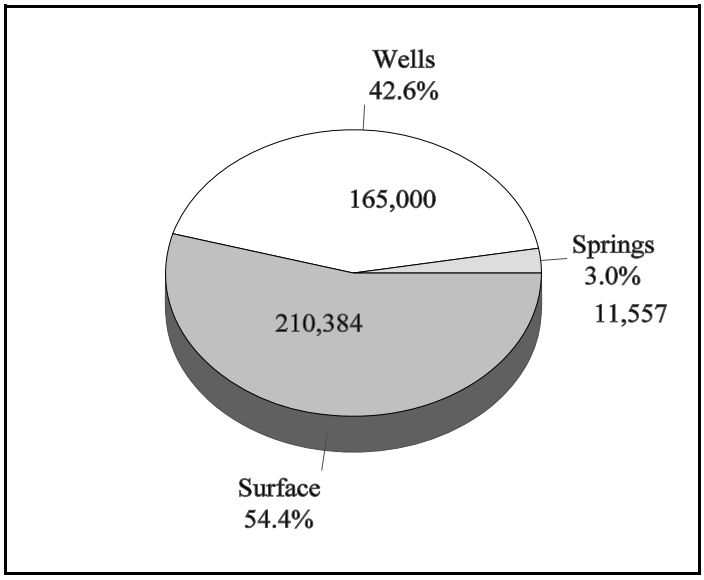


Figure 2-15 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

Figure 2-15 illustrates the maximum annual water supply for all public community systems in the Jordan River Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints. Specific to this basin, the State Engineer has limited total groundwater withdrawels to 165,000 acre feet. Therefore, the maximum supply for public community systems within the Jordan River Basin is determined to be 386,941 acre-feet per year. The reliable systems source capacity available for public community systems is reported as 352,838 acre-feet per year.

2.6.3 Public Community Water Systems -Water Use

Public community water systems account for the majority of the water use within the area, with potable water as the major type of water used. **Table 2-10** shows details of the total and per-capita water use for public communities within the area. The non-potable water use is that which secondary systems supply within the public community water system boundaries. The industrial water use is industrial water supplied only by the public community water systems and does not include the water use of non-community non-transient systems or self-supplied industries.

As can be seen, the single largest categorical water use is residential. More than half of this use is for outside watering. With the projected population growth, as well as the economic expansion of this area, efficient water use is becoming an increasingly higher priority. For more detailed information on M&I water supplies and uses, as well as the area's overall water outlook, refer to the *Utah State Water Plan, Jordan River Basin*, 1997, by the Department of Natural Resources, Division of Water Resources.

Table 2-10 Total and Per-capita Water Use of Public Community Water Systems Within the Jordan River Basin (pop. 879,850, circa 2000)

(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	174,287.4	177
Commercial Use:	35,333.6	36
Institutional Use:	25,934.8	26
Industrial Use:	10,743.5	11
SubTotal	**246,299.3**	**250**
Non-potable Water		
Residential Use:	6,512.6	7
Commercial Use:	2,487.2	3
Institutional Use:	3,757.8	4
Industrial Use:	0.0	0
SubTotal	**12,757.6**	**13**
TOTAL	**259,056.9**	**263**

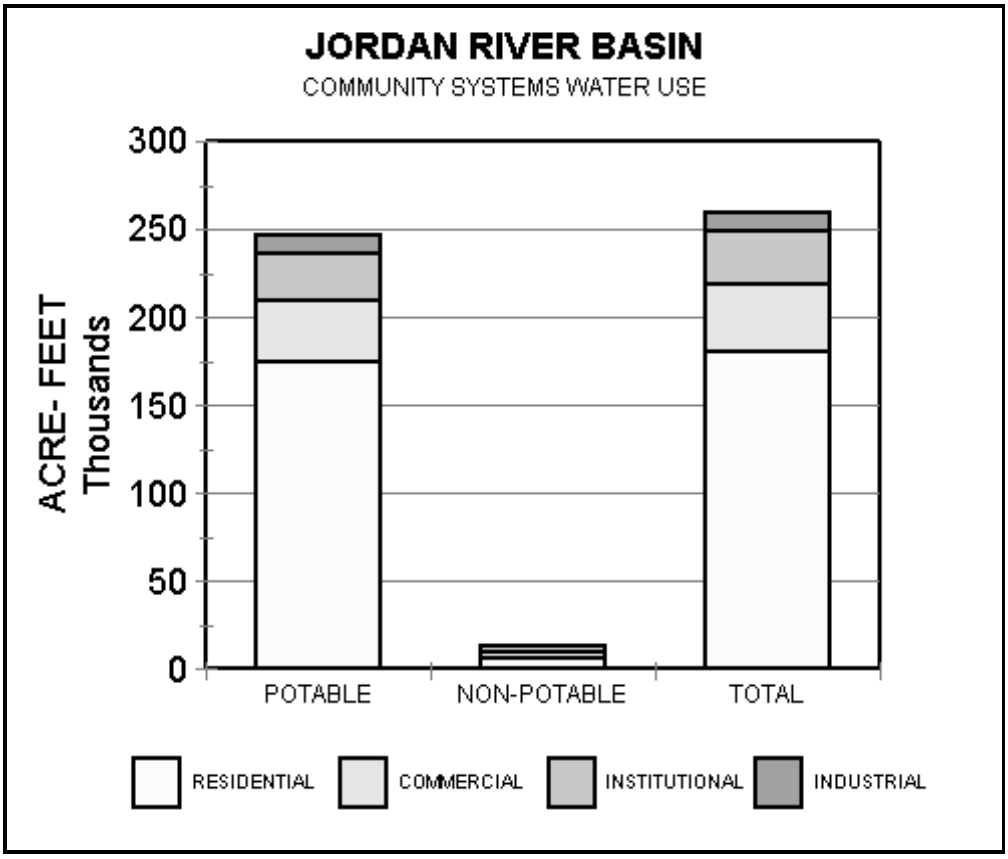


Figure 2-16 Public Community Systems Categorical Water Use
Note: Each graph scale varies - compare values only.

2.7 Sevier River Basin
(Data collected from calender year 1996)

The Sevier River Basin covers approximately 10,522 square miles (about 12.5 percent of Utah) in the south-central portion of Utah. The shape of the basin generally resembles a large horseshoe and consists of high plateaus, narrow valleys, and expansive deserts. Mountains ranges of the basin generally trend from southwest to northeast. Valleys in the basin are generally long and narrow, except where the Sevier River flows into Sevier Lake. Drainage in the basin is primarily to the north and west. Because the basin offers no outward drainage, precipitation received remains in the basin.

The Sevier River Basin covers all or part of eight counties including: Garfield, Iron, Juab, Kane, Millard, Piute, Sanpete, and Sevier. Furthermore, the basin encroaches into the Delta, East Fork Sevier, Fillmore, Gunnison, San Pitch, Sevier, Sevier Lake, and Upper Sevier SubAreas. See **Figure 2-1** for an illustration of the basin boundaries.

2.7.1 Basin Water Use

The 47,683 acre-feet of water used in this basin is evenly split between potable and non-potable water applications. The greater amount of total water is used by several industries in Millard County, including Brush-Wellman Incorporated, Intermountain Power Service, and Delta Valley Farms. These industries utilize nearly 52 percent of all water used within the basin. Most of this water is untreated and obtained by the industries. According to the classifications set forth by the Division of Drinking Water, these industries are classified as non-community non-transient systems. Stock watering is another significant use of non-potable water in the area.

The 57 community water systems in the basin serve over 47,800 people (about 88 percent of the basin's 54,280 estimated population in 1996). See **Figure 2-17** for locations of the public community water systems in the basin. Non-community use, including the above mentioned industries, accounts for one-third of the potable water use. Sixty-four public non-community water systems are located within the basin. These systems serve Bryce Canyon National Park, Yuba and Palisade State parks, campgrounds in the Fishlake and Manti-Lasal National Forests and other areas, roadside rest areas, and isolated commercial establishments. Other than potable water for industrial and commercial purposes, most of the potable water is utilized for residential applications. **Table 2-11** summarizes the water use in the Sevier River Basin.

Table 2-11 Water Use of the Sevier River Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	14,317	5,768	20,085
PUBLIC NON-COMMUNITY TRANSIENT	208	570	778
PUBLIC NON-COMMUNITY NON-TRANSIENT	7,140	18,000	25,140
PRIVATE DOMESTIC	1,680	0	1,680
TOTALS (Ac-Ft/Year)	23,345	24,338	47,683

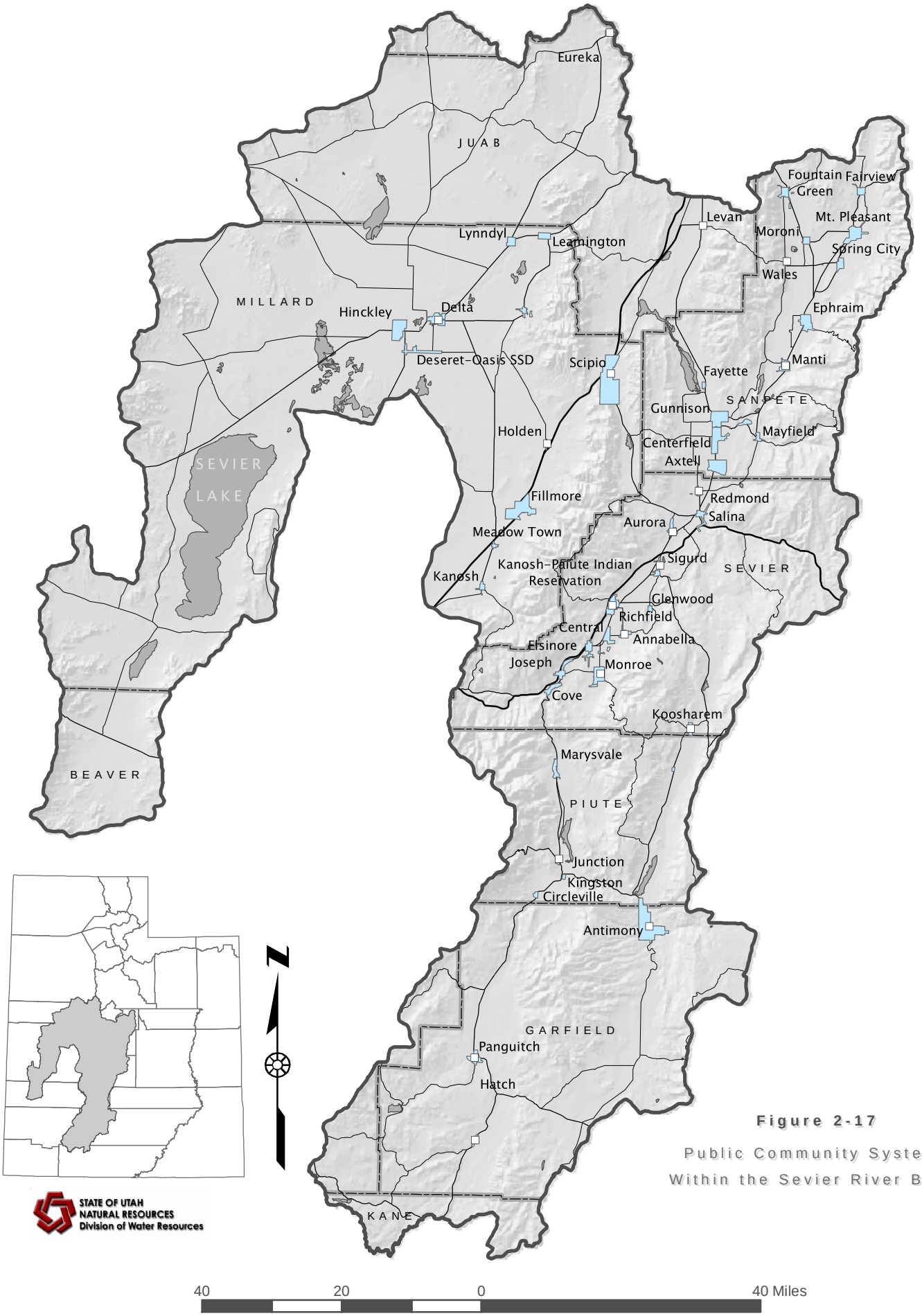


Figure 2-17

Public Community Systems Within the Sevier River Basin

2.7.2 Public Community Water Systems - Source of Supply

Potable water in the Sevier River Basin is supplied from groundwater aquifers either naturally through springs, or mechanically with the use of wells. **Figure 2-18** illustrates the maximum annual water supply for all public community water systems in the Sevier River Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic constraints, and/or system constraints. The maximum supply currently available to public community systems within the Sevier River Basin is 41,577 acre-feet (this amount includes 155 acre-feet of Eureka City Water which is supplied by wells in the Utah Lake Basin). The reliable systems source capacity for public community systems is 20,840 acre-feet. Reliable or maximum supply rates for individual private water suppliers are not within the scope of this report. No surface water is currently used as a potable water source. Economical constraints of treating surface water and the abundance of high quality groundwater supply are the primary reasons for not utilizing surface water as a potable water source.

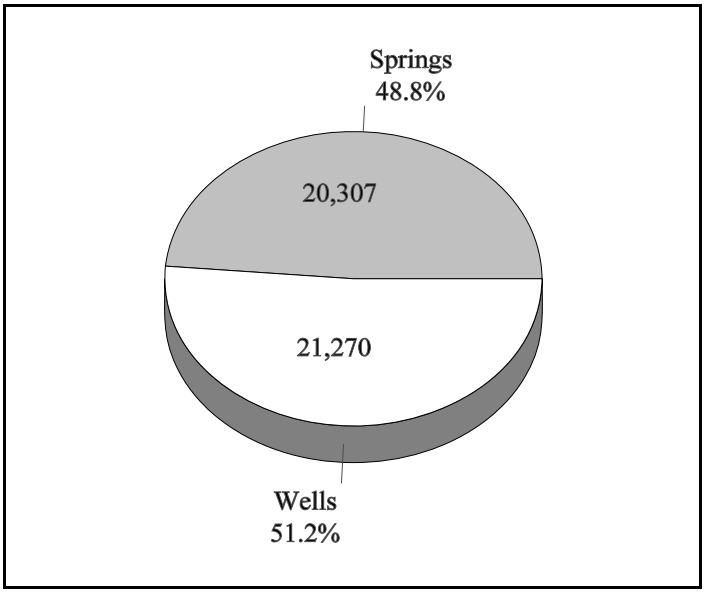


Figure 2-18 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.7. 3 Public Community Water Systems -Water Use

Though the public community water systems serve the population majority, the largest water users are the several industries previously mentioned. However, a significant amount of potable and non-potable water is supplied to these industries by public community systems. **Table 2-12** indicates the total and per-capita water use rates for public community water systems within the Sevier River Basin. The non-potable water use indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates industrial water supplied only by the public community water systems. Values of **Table 2-12** do not include the large volumes of water used by self-supplied industries within the Sevier River Basin.

Figure 2-19 graphically illustrates the total use data of **Table 2-12**, showing how water is used throughout the basin. Note that the use is divided into categories of residential, commercial, institutional, and industrial. For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Sevier River Basin*, 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-12 Total and Per-capita Water Use of Public Community Water Systems Within the Sevier River Basin. (pop. 47,815, circa 1996)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	9,174.1	171
Commercial Use:	1,627.2	30
Institutional Use:	2,346.1	44
Industrial Use:	1,169.3	22
Sub Total	**14,316.7**	**267**
Non-potable Water		
Residential Use:	4,653.5	87
Commercial Use:	1.4	0
Institutional Use:	1,112.2	21
Industrial Use:	1.3	0
Sub Total	**5,768.4**	**108**
TOTAL	**20,085.1**	**375**

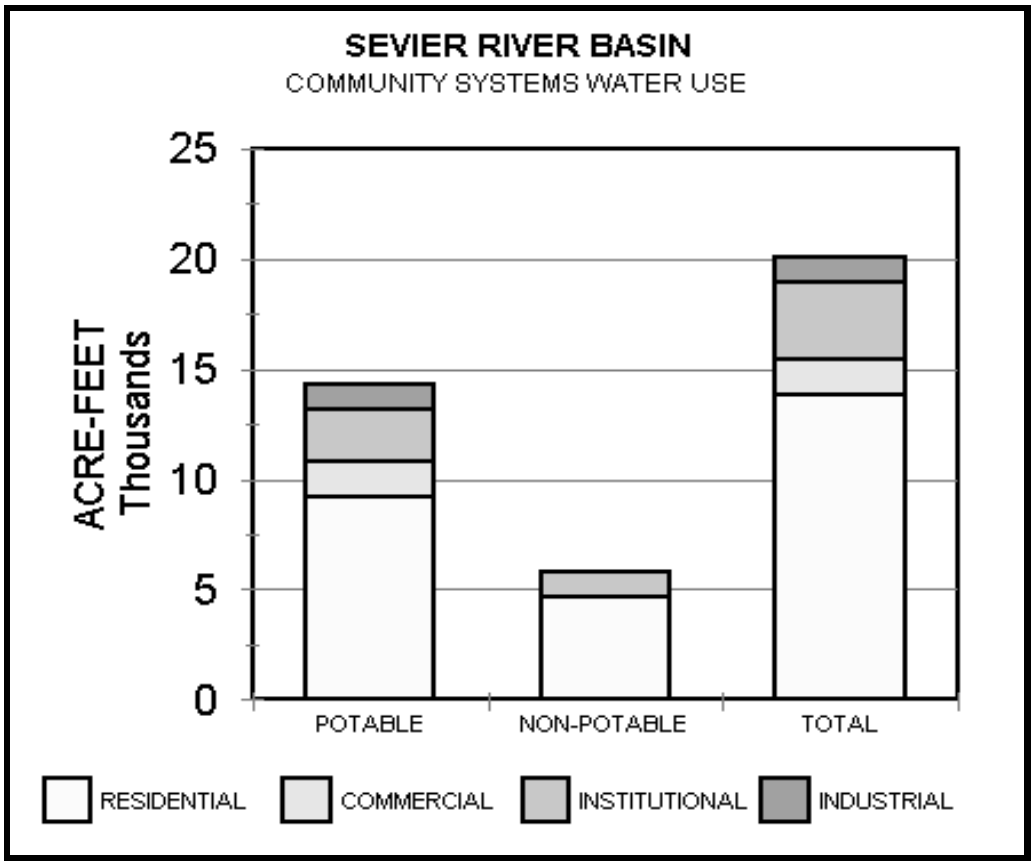


Figure 2-19 Public Community Water Systems Categorical Water Use.
Note: Each section's graph scale varies - compare values only.

2.8 Cedar/Beaver Basin
(Data collected from calender year 1992)

The Cedar/Beaver Basin covers approximately 5,560 square miles. With the exception of 38,500 acres in Nevada, the basin is located mostly in southwestern Utah. The basin is bounded on the east by the Tushar Mountains and the Markagunt Plateau. The northern perimeter of the basin is defined by Black Rock Cap and the northern side of Clear Lake. The physical boundaries of the basin on the west are a series of mountain ranges including the Cricket Mountains, the San Francisco Mountains, the Wah Wah Mountains, and the Indian Peak Mountains in Nevada. The basin is contained on the south by the Bull Valley Mountains and the Harmont Mountains.

The basin spans all or part of five counties including Millard, Beaver, Iron, Washington, and a small portion of Garfield County. See **Figure 2-1** for an illustration of the basin boundaries.

2.8.1 Basin Water Use

Of the total of 19,714 acre-feet of water used in this basin, the quantity of potable and non-potable water is practically equal. Throughout the basin secondary water systems provide non-potable water for outside irrigation. Percentage-wise, secondary use in this basin is one of the highest in the state. Additionally, industries providing their own water, such as Intermountain Geothermal and Mother Earth Industries, also utilize large volumes of non-potable water. Total non-potable water use in the basin is 10,620 acre-feet. Refer to the Appendix for a more complete review of water use by water and system type for all the hydrologic basins and counties of Utah.

The basin currently has 21 public community water systems serving 26,541 people. **Figure 2-20** illustrates the location of the public community water systems within the basin. Non-community water systems provide nearly 70 percent of the water used in this basin. Thirty-three of these water systems are accounted for in this report. These systems serve a significant amount of the population. They also provide the water used in campgrounds in the Fishlake and Dixie National forests and elsewhere, recreation areas such as the Cedar Breaks National Monument, as well as roadside rest areas. The following **Table 2-13** summarizes water use in the Cedar/Beaver Basin.

Table 2-13 Water Use of the Cedar/Beaver Basin
(Figures may not add to totals due to independent rounding)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	8,049	3,327	11,376
PUBLIC NON-COMMUNITY TRANSIENT	127	0	127
PUBLIC NON-COMMUNITY NON-TRANSIENT	256	7,293	7,548
PRIVATE DOMESTIC	663	0	9,757
TOTALS (Ac-Ft/Year)	9,094	10,620	19,714

Figure 2-20

Public Community Systems
Within the Cedar/Beaver Basin

2.8.2 Potable Water Source - Public Community Systems

Potable water in the Cedar/Beaver Basin is supplied from groundwater aquifers either naturally through springs, or mechanically with the use of wells. **Figure 2-21** illustrates the maximum annual water supply for all public community water systems in the Cedar/Beaver Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints.

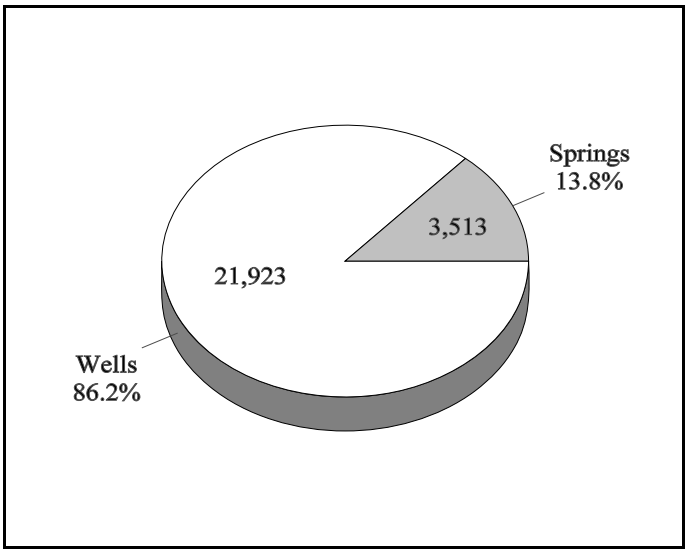


Figure 2-21 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

The maximum supply currently available to public community water systems within the Cedar/Beaver Basin is 25,436 acre-feet. The reliable systems source capacity for public community water systems is 11,585 acre-feet. Reliable or maximum supply rates for individual private water suppliers are not within the scope of this report. No surface water is currently used as a potable water source. Economical constraints of treating surface water and higher quality groundwater are the primary reasons for not utilizing surface water as a potable water source.

2.8.3 Public Community Water Systems - Water Use

Though the public community water systems account for the majority of the water supplied to the population, the largest water users are the industries in Beaver County mentioned previously. These industries utilize nearly 35 percent of all water used within the basin. According to the classifications set forth by the Division of Drinking Water, these industries are classified as non-community non-transient systems. Non-potable water is the major type of water used in the Cedar/Beaver Basin. This form of untreated water is used extensively in industrial processing. Therefore, non-potable water use is not indicative of water use rates for the general population. To accurately compare typical use rates per person, only the water use for public community systems is being summarized here.

Table 2-14 indicates the total and per-capita use for public communities within the basin. The use values are divided into the categories of residential, commercial, institutional, and industrial. The non-potable water use value is the water that secondary irrigation systems supply only within communities. Similarly, the industrial use category indicates industrial water supplied only by the public community systems. **Figure 2-22** illustrates the total use data of **Table 2-14**.

For a more detailed description of water use, refer to *Municipal and Industrial Water Supply, Use and Rights in Beaver and Iron Counties and the Enterprise Area*, July 1994, by Hansen Allen and Luce Inc. for the Utah Department of Natural Resources, Division of Water Resources.

Table 2-14 Total and Per-capita Water Use of Public Community Water Systems within the Cedar/Beaver Basin. (pop. 26,541, circa 1992)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	6506.5	219
Commercial Use:	645.9	22
Institutional Use:	605.9	20
Industrial Use:	290.2	10
Sub Total	**8048.5**	**271**
Non-potable Water		
Residential Use:	1912	64
Commercial Use:	160	5
Institutional Use:	1255	42
Industrial Use:	0	0
Sub Total	**3327**	**112**
TOTAL	**11375.5**	**383**

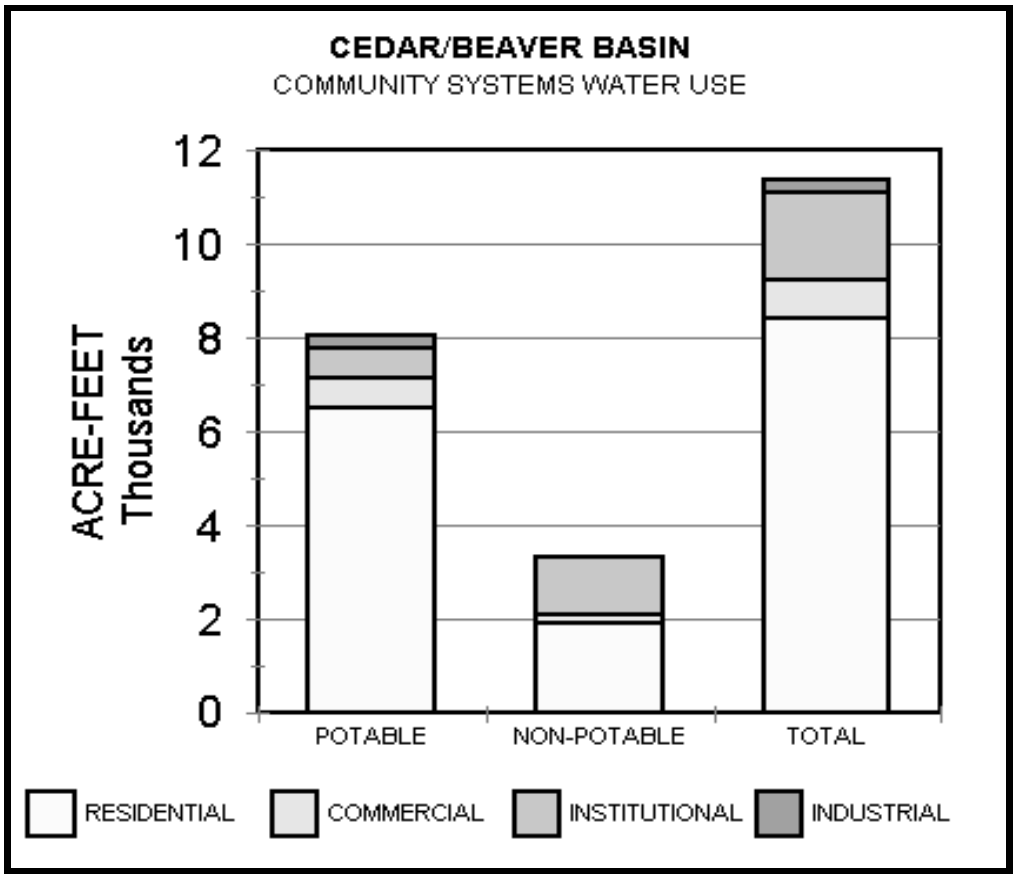


Figure 2-22 Public Community Systems Categorical Water Use.
Note: Each section's graph scale varies - compare values only.

2.9 Uintah Basin
(Data collected from calender year 1995)

The Uintah Basin is composed of approximately 10,890 square miles (6,969,600 acres) of land. The Utah/Wyoming and the Utah/Colorado state lines form much of the basin's northern and eastern boundaries respectively. Portions of the Wasatch Mountain Range and the Roan Cliffs comprise the southern and western boundaries. The Uintah Basin contains a wide variety of valleys and mountains. The basin has a low elevation of 4,040 feet above mean sea level at a point along the Green River and gradually increases through several valleys into the higher mountains and plateaus of the Uinta Mountains. Kings Peak, in the Uinta Mountains stands at 13,528 feet above mean sea level.

The basin spans all or part of nine counties: Carbon, Daggett, Emery, Duchesne, Grand, Summit, Uintah, Utah and Wasatch. The portions of Carbon, Emery, Grand and Utah counties within the basin contain no public water systems and are not included as part of this report. See **Figure 2-1** for an illustration of the basin boundaries within the state of Utah.

2.9.1 Basin Water Use

Of the 24,427 acre-feet of water use in this basin, 60 percent of the water is potable water. Non-potable water is used extensively by industries in Uintah County including American Gilsonite Co.; Chevron USA, Inc.; CNG Producing, Inc.; Deseret Generation and Transport Co.; Flying J, Inc.; and Gerrity Oil Co., among others. The basin has self-supplied industries.

In the basin, there are currently 22 public community water systems and one unregulated Indian water system. These systems serve 35,778 people (about 91 percent of the 39,245 total population of the basin). **Figure 2-23** illustrates the location of the public community water systems. Refer to the Appendix for a more complete breakdown of water usage by water and system type for not only the hydrologic basins, but also the counties of the state.

Forty-five public non-community water systems serve Flaming Gorge National Recreation area, state parks at Steinaker and Starvation reservoirs, campgrounds in the Wasatch, Ashley, and Uintah National forests, isolated commercial recreational areas, and roadside rest areas. The following **Table 2-15** summarizes water use in the basin.

Table 2-15 Water Use of the Uintah Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON--POTABLE	
PUBLIC COMMUNITY	9,590	2,629	12,218
PUBLIC NON-COMMUNITY TRANSIENT	116	45	161
PUBLIC NON-COMMUNITY NON-TRANSIENT	4,173	7,000	11,173
PRIVATE DOMESTIC	875	0	875
TOTALS (Ac-Ft/Year)	14,753	9,674	24,427

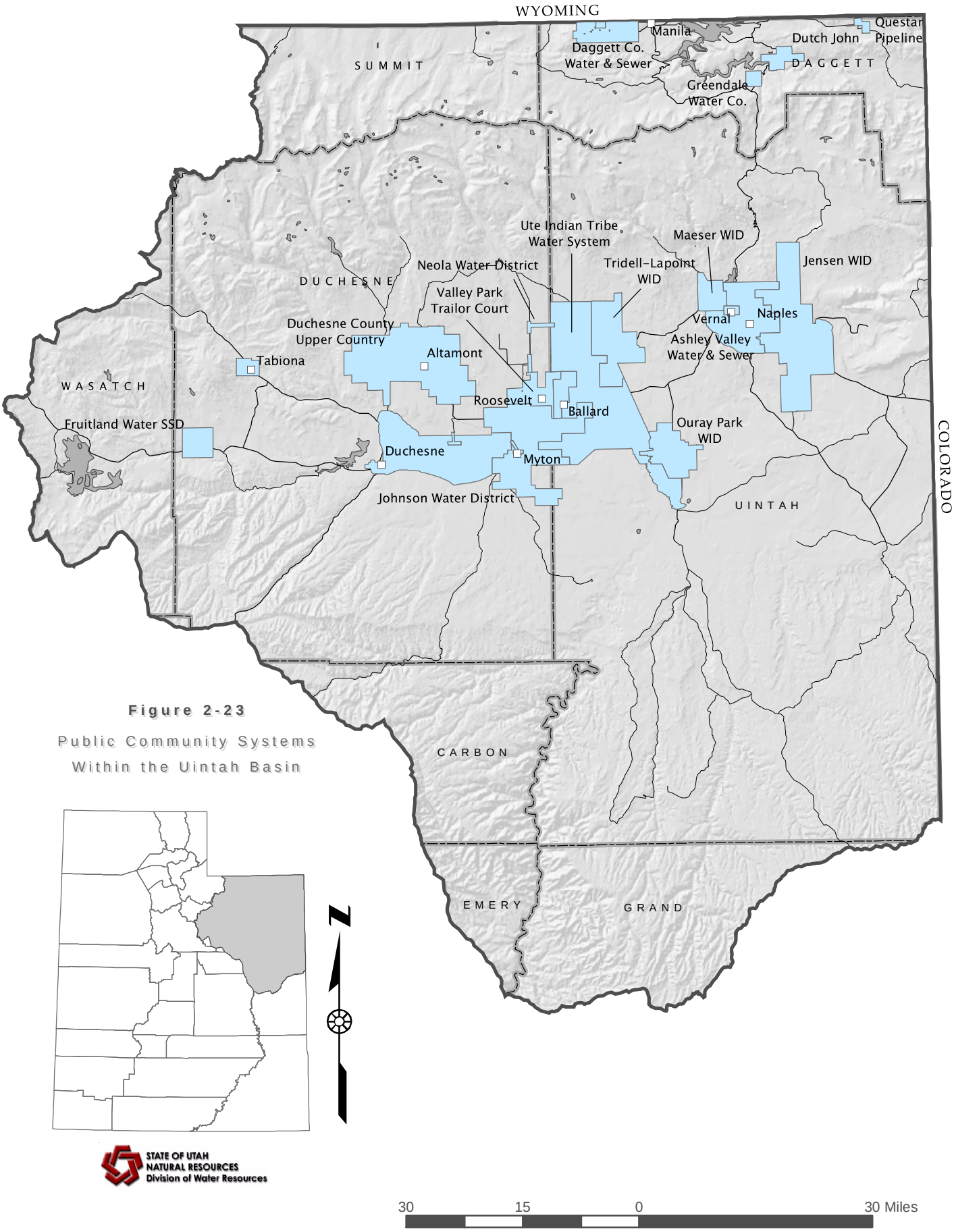


Figure 2-23

Public Community Systems Within the Uintah Basin

STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources

2.9.2 Public Community Water Systems - Source of Supply

Potable water in the Uintah Basin is supplied from surface runoff and groundwater aquifers. In addition to their own supplies, many systems receive water from districts such as the Central Utah and Uintah Water Conservancy districts. **Figure 2-24** illustrates the maximum annual water supply for all public community systems in the Uintah Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints.

The maximum supply currently available to public community systems within the Uintah Basin is 39,731 acre-feet. The reliable systems source capacity for public community water systems is 18,133 acre-feet.

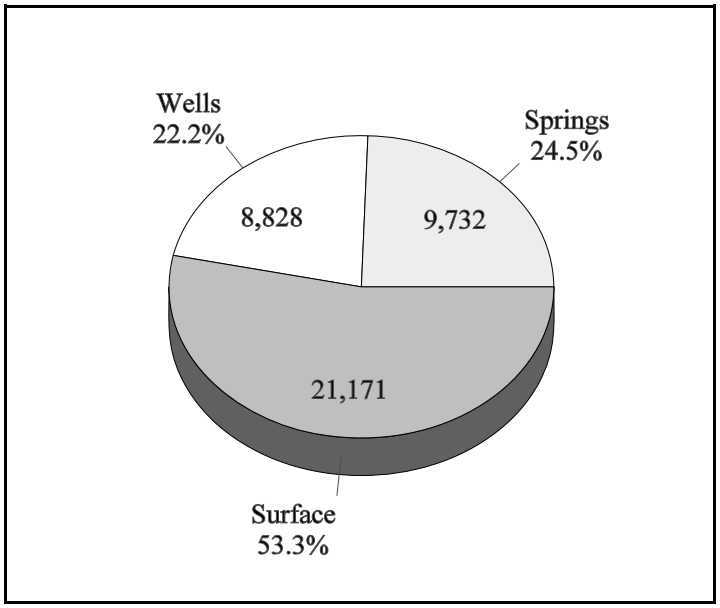


Figure 2-24 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.9.3 Public Community Water Systems - Water Use

Potable water accounts for the vast majority of water used through public community systems. **Table 2-16** shows the total and the per-capita use rates for public communities within the Uintah Basin. The use categories of residential, commercial, institutional, and industrial are shown. The non-potable water use value indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates industrial water used that is supplied by the public community water systems.

Values of **Table 2-16** do not include the large volumes of water used by non-community non-transient systems or self-supplied industries within the Uintah Basin. **Figure 2-25** graphically illustrates the total use data of **Table 2-16**.

For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Uintah Basin*, July 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-16 Total and Per-capita Water Use of Public Community Water Systems Within the Uintah Basin. (pop. 35,778, circa 1995)

(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	6467.1	161
Commercial Use:	881.6	22
Institutional Use:	1214.6	30
Industrial Use:	1026.3	26
Sub Total	**9589.6**	**239**
Non-potable Water		
Residential Use:	1519.7	38
Commercial Use:	10.0	0
Institutional Use:	1098.9	27
Industrial Use:	0.3	0
Sub Total	**2628.9**	**66**
TOTAL	**12218.5**	**305**

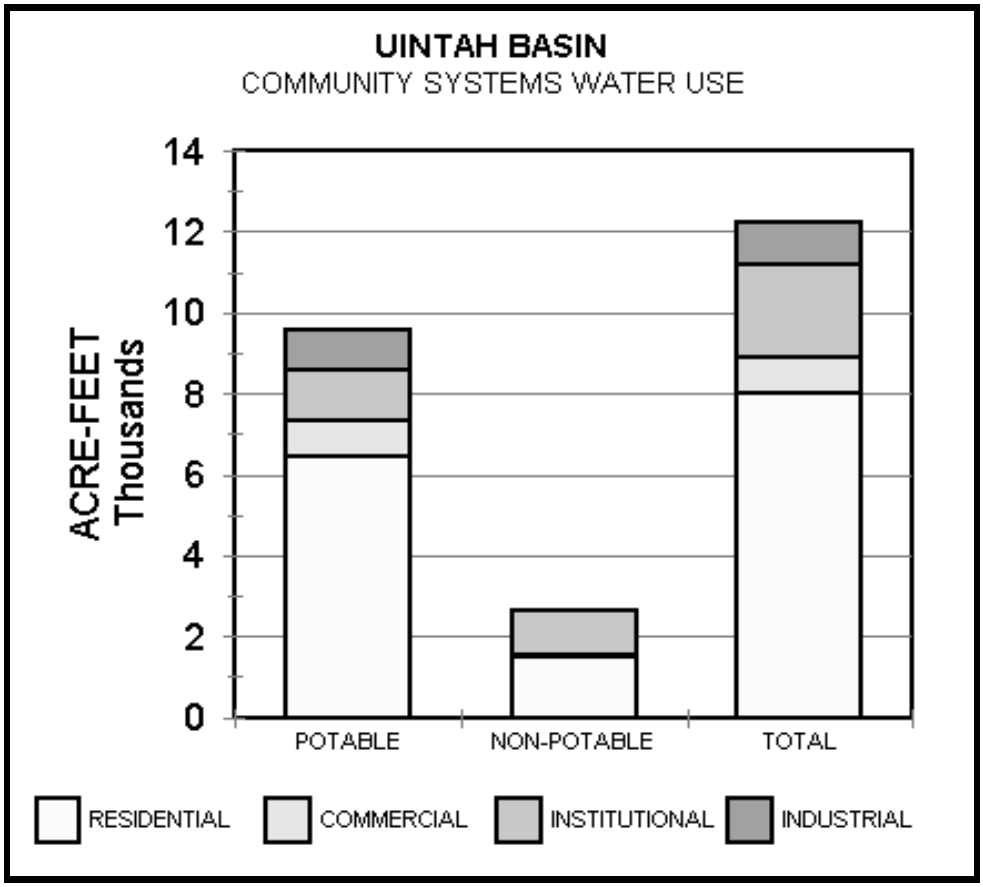


Figure 2-25 Public Community Systems Categorical Water Use.
Note: Each section's graph scale varies - compare values only.

2.10 West Colorado River Basin
(Data collected from calender year 1996)

The West Colorado River Basin covers 15,411 square miles (9,863,040 acres) of land. The boundary starts with Soldier Summit and follows a clockwise path containing the Roan Cliffs, followed by a south-trending line toward Elk Ridge, the Clay Hills, the Straight Cliffs of the Kaiparowits Plateau, the Aquarius Plateau, the Awapa Plateau, and finally the Wasatch Plateau and back up to Soldier Summit. See **Figure 2-1** for an illustration of the basin boundaries in Utah.

The basin spans all or part of 12 counties: Carbon, Duchesne, Emery, Garfield, Grand, Kane, San Juan, Sanpete, Sevier, Utah, Wasatch and Wayne. Duchesne and Wasatch counties contain no public water systems within the basin and are not included in this report.

The West Colorado River Basin contains a widely varied topography. Elevations begin at less than 4,000 feet above mean sea level at the southern tip and gradually increase throughout several valleys into the higher mountains and plateaus of the basin. Notably, Mt. Ellen of the Henry Mountains stands 11,522 feet above mean sea level.

2.10.1 Basin Water Use

Of the 51,223 acre-feet of total water use in this basin, the largest categorical use, at 37,012 acre-feet, is non-potable water used mostly for various mining and other industries in Carbon and Emery counties. Additionally, many of the communities have secondary water systems using non-potable water for outside watering.

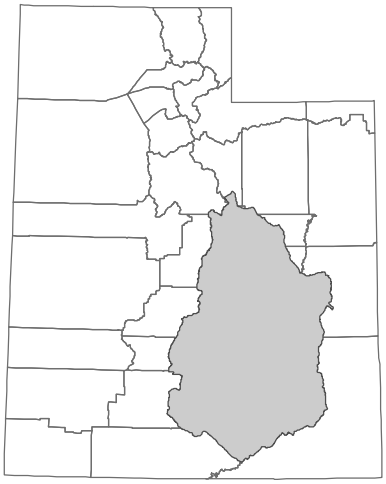
The West Colorado River Basin currently has 31 public community water systems serving 36,523 people (about 98 percent of the 37,200 total population of the basin). See **Figure 2-26** for the location of the public community water systems within the basin. The basin also has 55 public non-community water systems that serve national parks and/or monuments including Canyonlands, Capitol Reef, Arches, Glen Canyon, and the new Grand Staircase-Escalante; state parks such as: Escalante, Goblin Valley, Green River, and the Anasazi; camping and rest areas; and isolated commercial establishments. Refer to the Appendix for a more complete details of water usage by water and system type for the hydrologic basins and the counties of Utah. The following **Table 2-17** summarizes the overall water use for this hydrologic basin.

Table 2-17 Water Use of the West Colorado River Basin
(Figures may not add to totals due to independent rounding.)

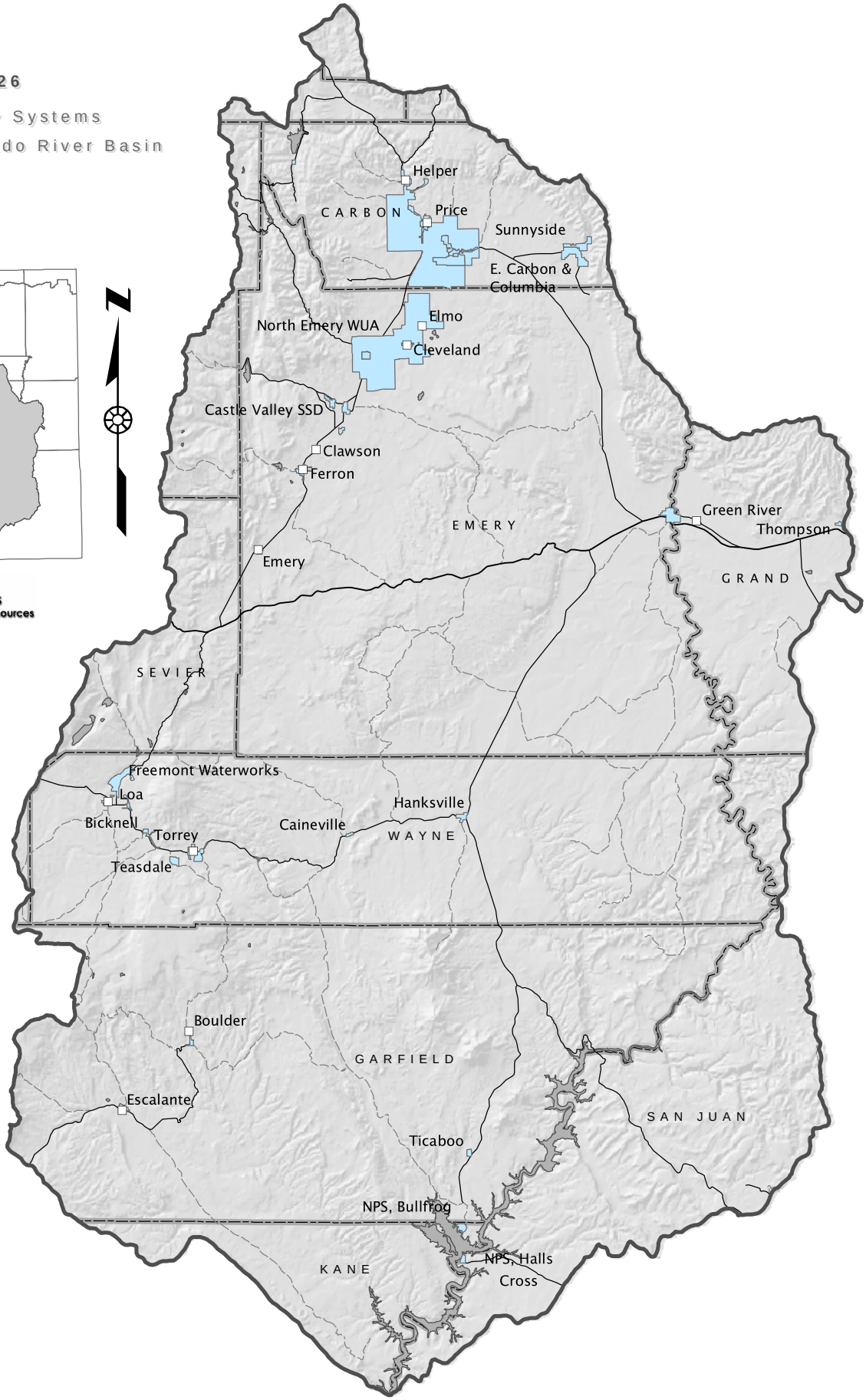
WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	10,190	4,812	15,003
PUBLIC NON-COMMUNIT TRANSIENT	81	0	81
PUBLIC NON-COMMUNIT NON-TRANSIENT	3,684	32,200	35,884
PRIVATE DOMESTIC	255	0	255
TOTALS (Ac-Ft/Year)	14,211	37,012	51,223

Figure 2-26

Public Community Systems
Within the West Colorado River Basin



STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources



2.10.2 Public Community Water Systems - Source of Supply

Potable water in the West Colorado River Basin is supplied from groundwater aquifers and diversions from local streams and rivers. **Figure 2-27** illustrates the maximum annual water supply for all public community systems in the West Colorado River Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints. The maximum supply currently available to public community systems within the West Colorado River Basin is 26,945 acre-feet. The reliable systems source capacity for public community systems is 13,422 acre-feet.

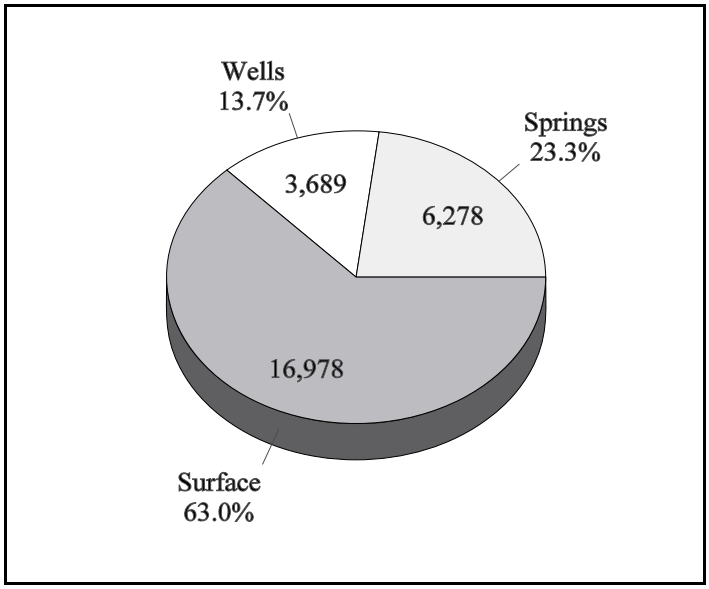


Figure 2-27 Maximum Potable Water Supply for Public Community Systems (values are in acre-feet).

2.10.3 Public Community Water Systems - Water Use

The public community water systems water use is about 25 percent of the total use in the basin. Of this, two-thirds is potable and one-third is non-potable. **Table 2-18** illustrates the total and per-capita use rates for public communities within the basin. The use categories are for residential, commercial, institutional, and industrial.

Non-potable water is the major type of water used in the West Colorado River Basin. This form of untreated water is used extensively in industrial processing and mining. Therefore, non-potable water use by these non-community non-transient systems is not indicative of water use rates for the general population. To accurately compare typical use rates per person, the secondary water use for public community water systems is based only on the water secondary water systems supply within the public community system boundaries. The industrial use category indicates industrial water supplied only by the public community water systems. Values of **Table 2-18** do not include the large volumes of water used by self-supplied industries or non-community non transient systems within the West Colorado River Basin. **Figure 2-28** graphically illustrates the total use values of **Table 2-18**.

For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the West Colorado River Basin*, July 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-18 Total and Per-capita Water Use of Public Community Water Systems Within the West Colorado River Basin. (pop. 36,523 circa 1996)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	7617.2	186
Commercial Use:	1014.6	25
Institutional Use:	1198.6	29
Industrial Use:	359.8	9
Sub Total	**10190.2**	**249**
Non-potable Water		
Residential Use:	3739.6	91
Commercial Use:	0	0
Institutional Use:	1072.8	26
Industrial Use:	0	0
Sub Total	**4812.4**	**118**
TOTAL	**15002.6**	**367**

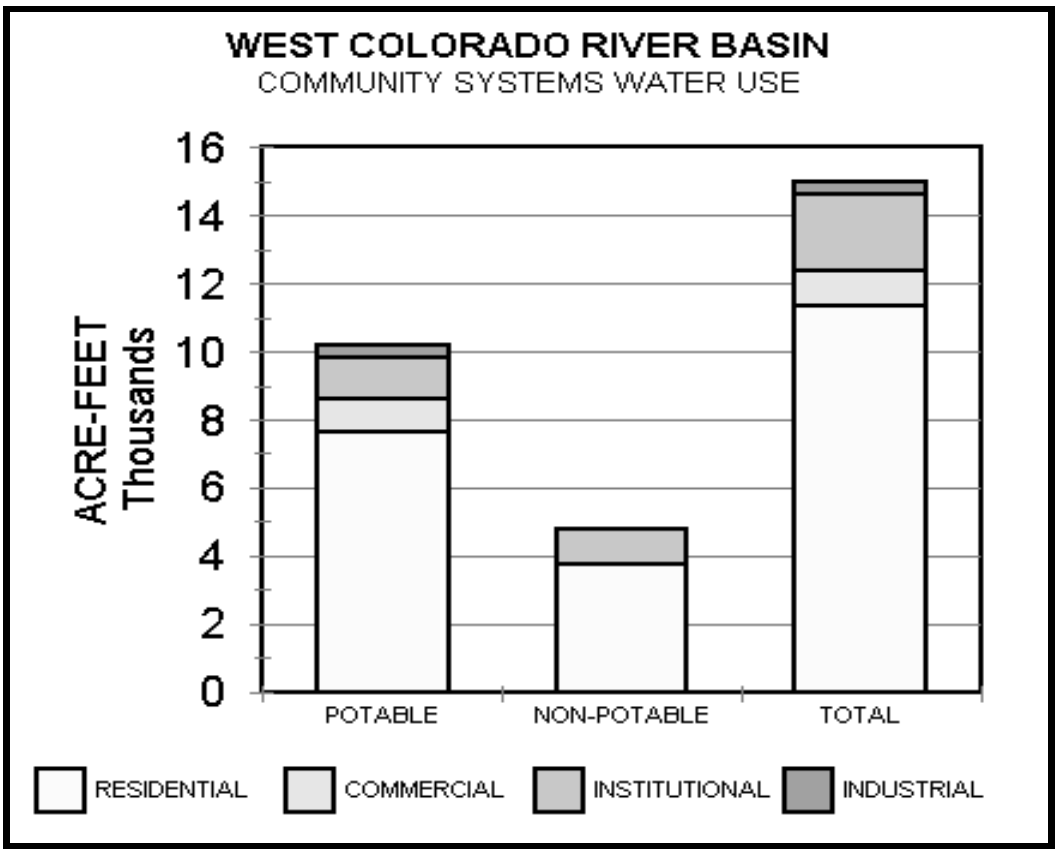


Figure 2-28 Public Community Systems Categorical Water Use.
Note: Each section's graph scale varies - compare values only.

2.11 Southeast Colorado River Basin
(Data collected from calender year 1996)

The Southeast Colorado River Basin covers 10,876 square miles (6,960,629 acres) of land in Utah. The Book Cliffs stand as the basin's northern boundary. Roughly half of the Utah/Colorado state line forms the eastern boundary, while two-thirds of the Utah/Arizona state line forms the southern boundary. The eastern boundary follows the Timber Mountains between the Paria drainage and Johnson Creek drainage. It then follows the Pink Cliffs in Bryce Canyon and then diverts in a southwesterly direction on the Kaiparowits Plateau and Fiftymile Mountain to the confluence of the San Juan River and the Colorado River (now in Lake Powell). The boundary continues along the Clay Hills and Elk Ridge to the confluence of the Green and Colorado rivers. Above this, the boundary follows the drainage divide between these two rivers and Book Cliffs over to the Utah-Colorado state line. See **Figure 2-1** for an illustration of the basin boundaries in Utah.

The basin spans part of four Utah counties: Grand, San Juan, Kane, and Garfield. Elevations within the basin peak at 12,721 feet above mean sea level in the La Sal Mountains east of Moab. Lake Powell has the lowest elevation at an average of 3,700 feet above mean sea level.

2.11.1 Basin Water Use

This basin has the lowest total water use in the state at 8,524 acre-feet. About one-third of this is for residential use, potable and non-potable water. Just over 1,000 acre-feet of potable water is used through private domestic systems, generally private wells. Total non-potable water use is 2,269 acre-feet, with communities using about half of the amount, at 1,329 acre-feet.

The Southeast Colorado River Basin currently has 15 public community water systems and 8 unregulated Native American water systems in, serving 14,796 people. **Figure 2-29** locates the public community water systems within the basin. The basin also has 26 public non-community systems. These systems serve national parks and/or monuments including Arches, Canyonlands, Natural Bridges, Monument Valley, as well as the new Grand Staircase-Escalante; state parks including Kodachrome Basin, Goosenecks, and Dead Horse Point; campgrounds in the Manti-Lasal National Forest; isolated commercial establishments; and roadside rest stops. Refer to the Appendix for a more complete analysis of water usage, by water and system type, for not only the hydrologic basins, but also the counties of Utah. **Table 2-19** summarizes water use in this basin.

Table 2-19 Water Use of the Southeast Colorado River Basin
(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	3,948	1,329	5,276
PUBLIC NON-COMMUNITY TRANSIENT	213	0	213
PUBLIC NON-COMMUNITY NON-TRANSIENT	1,090	940	2,030
PRIVATE DOMESTIC	1,005	0	1,005
TOTALS (Ac-Ft/Year)	6,256	2,269	8,524

Figure 2-29

Public Community Systems
Within the Southeast
Colorado River Basin

2.11.2 Public Community Water Systems - Source of Supply

Potable water in the Southeast Colorado River Basin is supplied mostly from groundwater. The majority of the supply is from well fields around populated areas such as Moab, the Castle Valley, and the Spanish Valley. The remainder of the supply comes from natural springs. **Figure 2-30** illustrates the maximum annual water supply for all public community water systems in the basin.

Maximum supply indicates how much water is available for use. All values represent the maximum system source capacities limited by water rights, hydrologic, and/or system constraints. The maximum supply currently available to public community water systems within the basin is 18,912 acre-feet. The reliable systems source capacity for public community water systems is 8,326 acre-feet.

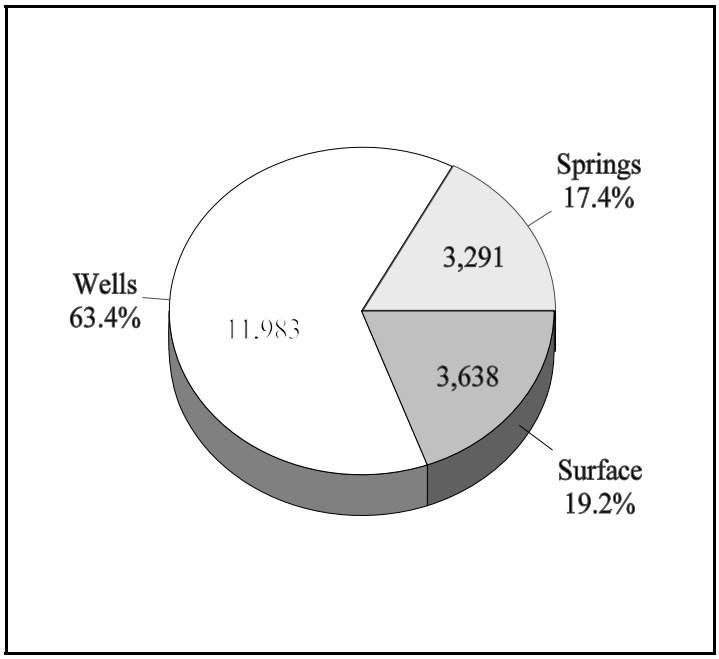


Figure 2-30 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.11.3 Public Community Systems -Water Use

The 15 public community water systems serve water to the majority of the population (14,796 of 21,150 total in the basin), as well as to institutional facilities, commercial establishments, and area industries. See **Figure 2-29** for locations of the public community water systems within the basin. Twenty-six public non-community water systems also serve national parks such as Arches, Bryce Canyon, and Canyonlands; the new Grand Staircase-Escalante National Monument; campgrounds; isolated commercial establishments; and roadside rest stops.

Table 2-20 indicates the breakdown of the total and the per-capita water use rates for public communities within the Southeast Colorado River Basin. The non-potable water use value is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category indicates the amount of industrial water which is only supplied by the public community water systems. **Figure 2-31** illustrates the total use values of **Table 2-20**. For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Southeast Colorado River Basin*, July 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-20 Total and Per-Capita Water Use of Public Community Water Systems Within the Southeast Colorado River Basin. (pop. 14,466, circa 1996)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	2889.7	157
Commercial Use:	644.5	35
Institutional Use:	334.5	18
Industrial Use:	79.1	4
Sub Total	**3947.8**	**214**
Non-potable Water		
Residential Use:	578.2	31
Commercial Use:	0	0
Institutional Use:	750.3	41
Industrial Use:	0	0
Sub Total	**1328.5**	**72**
TOTAL	**5276.3**	**286**

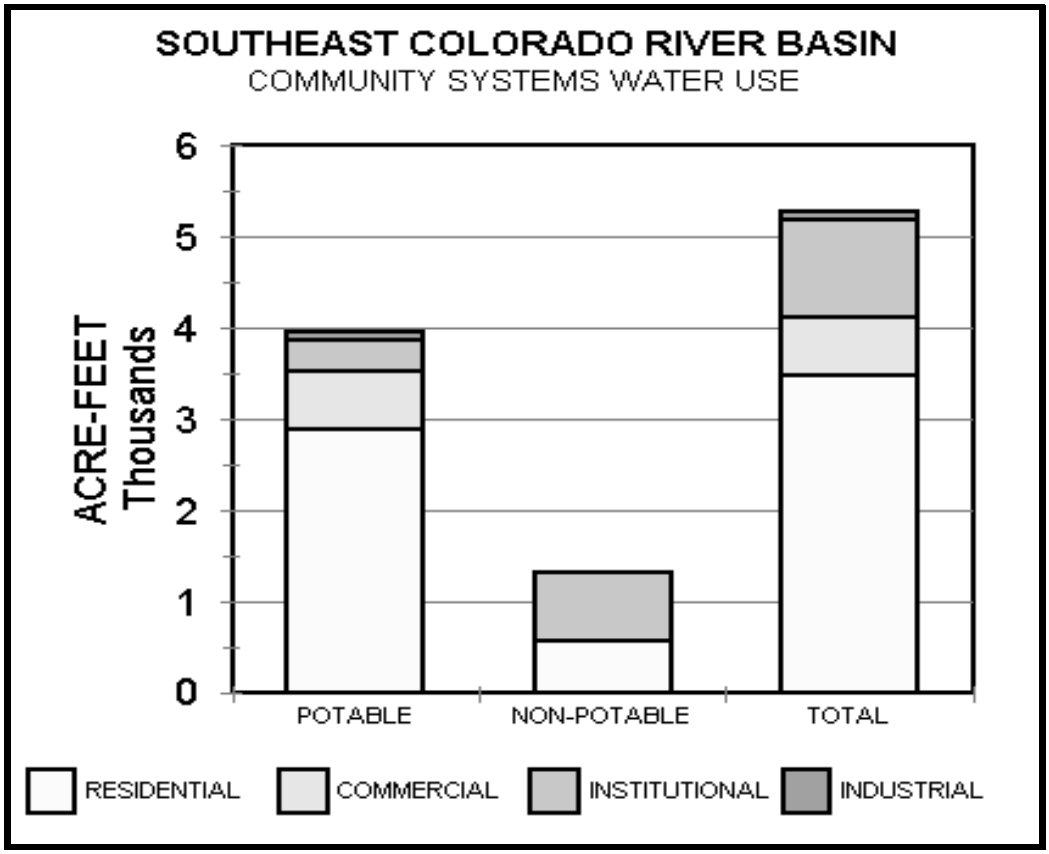


Figure 2-31 Public Community Systems Categorical Water Use.
Note: Each section's graph scale varies - compare values only.

2.12 Kanab Creek/Virgin River Basin

(Data collected from calender year 1997)

The Utah portion of the Kanab Creek/Virgin River Basin includes approximately 3,500 square miles of land in the southwest corner of the state. Utah's portion of the basin extends from the Utah/Arizona state line on the south to the Bull Valley and Harmony Mountains to the north. On the west, the basin extends from the Utah/Nevada state line east to the divide between Johnson Wash and Kaibab Gulch Tributaries, containing most of Washington County and part of Iron and Kane counties. See **Figure 2-1** for an illustration of the basin boundaries in Utah.

Elevations within the basin vary from a high of 10,375 feet at Black Mountain in the Cedar Mountains and 10,365 feet at Signal Peak in the Pine Valley Mountains to 2,297 feet and 2,461 feet where the Beaver Dam Wash and Virgin River cross the Utah/Arizona state line. Notable features of the basin include Zion National Park, Snow Canyon State Park, Coral Pink Sand Dunes State Park, and a portion of the Grand Staircase-Escalante National Monument.

2.12.1 Basin Water Use

The total water use of 42,413 acre-feet annually in this basin is almost entirely through public community systems. Non-potable water use is limited mostly to landscape irrigation for golf courses, parks, and some residential developments. Total non-potable use is 10,665 acre-feet. Not surprisingly, being one of the drier climates in the state with a population growth as high as any other area, this basin has the highest per-capita water use in the state.

The basin has 39 public community water systems (including Freedonia, Arizona) serving 85,535 people (almost all of the 85,675 total basin population). **Figure 2-32** locates the public community water systems within the basin. The basin also has 19 public non-community water systems serving national parks (Zion and the new Grand Staircase-Escalante); state parks including Snow Canyon, Coral Pink Sand Dunes, and Quail Creek; campgrounds in Dixie National Forest and elsewhere; isolated commercial establishments; and roadside rest stop areas. Refer to the Appendix for a more complete review of water usage by water and system type for hydrologic basins and the counties of the state. The following **Table 2-21** summarizes the water use in this basin.

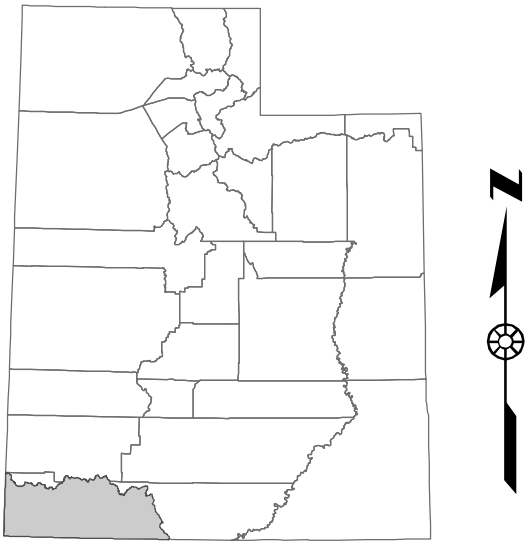
Table 2-21 Water Use of the Kanab Creek/Virgin River Basin

(Figures may not add to totals due to independent rounding.)

WATER SYSTEM CATEGORY	WATER USE (Ac-Ft/Year)		TOTAL (Ac-Ft/Year)
	POTABLE	NON-POTABLE	
PUBLIC COMMUNITY	31,472	10,620	42,093
PUBLIC NON-COMMUNITY TRANSIENT	135	4	139
PUBLIC NON-COMMUNITY NON-TRANSIENT	101	41	142
PRIVATE DOMESTIC	40	0	40
TOTALS	31,748	10,665	42,413

Figure 2-32

Public Community Systems
Within the Kanab Creek/
Virgin River Basin



STATE OF UTAH
NATURAL RESOURCES
Division of Water Resources

25 12.5 0 25 Miles

2.12.2 Public Community Water Systems - Source of Supply

Potable water in the Kanab Creek/Virgin River Basin is supplied mostly from groundwater through withdrawals from wells and the use of natural springs. Surface runoff is diverted to treatment plants for processing to culinary standards. The Washington County Water Conservancy District operates a treatment plant below Quail Creek Reservoir that delivers culinary water to the St. George area.

Figure 2-33 illustrates the maximum annual water supply for all public community water systems in the Kanab Creek/Virgin River Basin. Maximum supply indicates how much water is available for use. All values represent maximum system source capacities limited by water rights, hydrologic, and/or system constraints. The maximum supply currently available to public community systems within the Kanab Creek/Virgin River Basin is 57,315 acre-feet. The reliable systems source capacity for public community systems is 35,424 acre-feet.

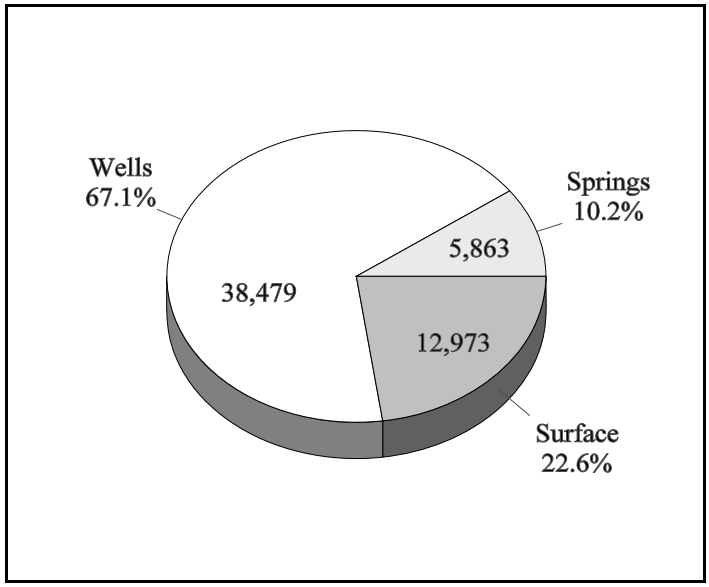


Figure 2-33 Maximum Potable Supply for Public Community Water Systems (values are in acre-feet).

2.12.3 Public Community Water Systems - Water Use

The public community water systems are the major users of water within the basin. Secondary water systems, providing non-potable water for irrigation to the public community, are used extensively in this basin. Most of the institutional and commercial non-potable water use is for the several private and public golf courses within the basin.

Potable water is the major type of water used in the basin. **Table 2-22** shows the total and per-capita water use for public communities within the basin. The non-potable water use indicated is that which secondary irrigation systems supply within the public community water system boundaries. The industrial use category includes only industrial water supplied by the public community systems. Values of **Table 2-22** do not include water used by non-community or private domestic systems. **Figure 2-34** graphically illustrates the total use values of **Table 2-22**.

For a more detailed description of water use by individual water users, please refer to *Municipal and Industrial Water Supply and Uses in the Kanab Creek/Virgin River Basin*, July 1998, by the Utah Department of Natural Resources, Division of Water Resources.

Table 2-22 Total and Per-capita Water Use of Public Community Water Systems Within the Kanab Creek/Virgin River Basin. (pop. 85,535, circa 1997)
(Figures may not add to totals due to independent rounding.)

Category	Total Use (Acre-Ft)	Rate (GPCD)
Potable Water		
Residential Use:	19992.3	209
Commercial Use:	8875.6	93
Institutional Use:	2077.7	22
Industrial Use:	526.8	5
Sub Total	**31472.4**	**328**
Non-potable Water		
Residential Use:	4449.9	46
Commercial Use:	1586.1	17
Institutional Use:	4584.3	48
Industrial Use:	0	0
Sub Total	**10620.3**	**111**
TOTAL	**42092.7**	**439**

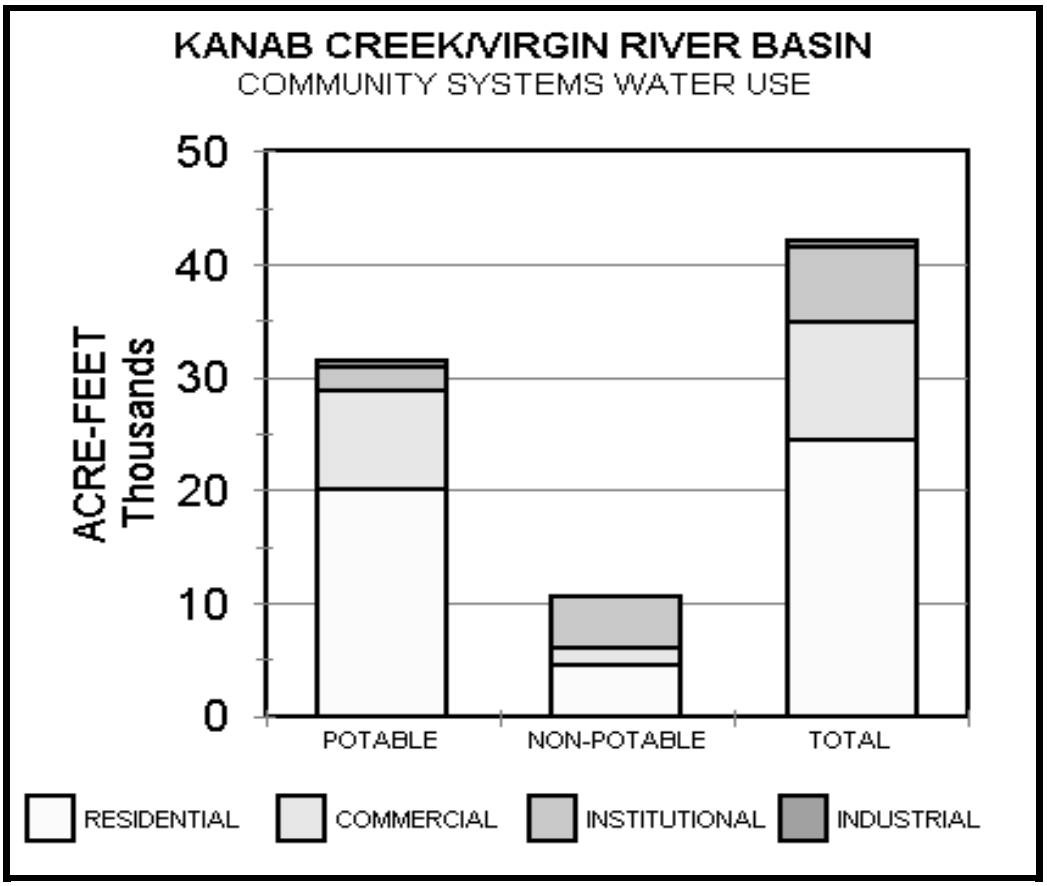


Figure 2-34 Public Community Systems Categorical Water Use.
Note: Each graph scale varies - compare values only.

Section-3

STATEWIDE SUMMARY

The state of Utah encompasses approximately 54,352,000 acres of land area, about 1,659,000 of which is covered by various bodies of water. As noted in the introduction, there are 11 hydrologic basins within the state boundaries. The previous section has presented a summary of the data contained in the individual *Municipal and Industrial Water Supply Studies* for the hydrologic basins. This section presents a summary of the combined data as a statewide overview. Following, the appendices present the summary data in a variety of ways, including the approximate water use by each of the 29 counties of Utah.

3.1 Statewide Municipal and Industrial Water Use

The Division of Water Resources has surveyed over 1,100 water systems throughout the state, since beginning the collection of comprehensive M&I data in 1992. Each water system was individually surveyed and all data concerning the system water deliveries was carefully reviewed, many times in person with the system managers and/or operators. Therefore, the data associated with water deliveries (water use) are accurate representations of each of the years when the data was collected. The data for each of the hydrologic basins has been arithmetically added and is presented in this summary as the statewide water use. This summarized statewide data is not exactly representative of any one of the single years of the summarized time period, nor would it represent an overall average of the same time period. However, the data does represent current M&I water use patterns and trends of the state of Utah.

The total combined water use of the state, potable and non-potable, during the period of the *Municipal and Industrial Water Supply Studies* summarized in this report, is 853,623 acre-feet annually. **Table 3-1** shows the detail of this statewide water use by all the categories of water systems of this report. Non-potable water deliveries account for one-quarter of overall water use, at 221,381 acre-feet of water annually. Additionally, over 250,000 acre feet of non-potable saline water is used from and around the Great Salt Lake for industrial purposes. However, due to the nature of this water and the large quantities involved, it is not included in any of the figures in this report. Among other reasons, any calculated gallons per capita per day use numbers for the counties and/or hydrologic basins where this use occurs would be unreasonably skewed and nonrepresentative of the most commonly noted water uses. **Figure 3-1** graphically illustrates the data of **Table 3-1.**

Potable water use in the state totals 632,248 acre-feet per year. The 648 public community water systems surveyed over the course of the studies account for the majority of this water at a total of 539,067 acre-feet of potable water per year. As can also be seen in the table, the combined categories of public community and public non-community non-transient (which includes all self-supplied industries) account for nearly all the municipal and industrial water use within the state.

Table 3-1 Total Statewide Municipal and Industrial Categorical Water Use

Category	Total Use (Acre-Ft)
Potable Water	
Residential Use:	383,818
Commercial Use:	75,637
Institutional Use:	76,529
Industrial Use:	96,257
Sub Total	**632,242**
Non-Potable Water	
Residential Use:	93,978
Commercial Use:	11,761
Institutional Use:	24,836
*Industrial Use:	90,806
Sub Total	**221,381**
TOTAL	**853,623**

*An additional 250,961 acre-feet of saline water used in Tooele and Weber counties for industrial purposes is not included in this figure.

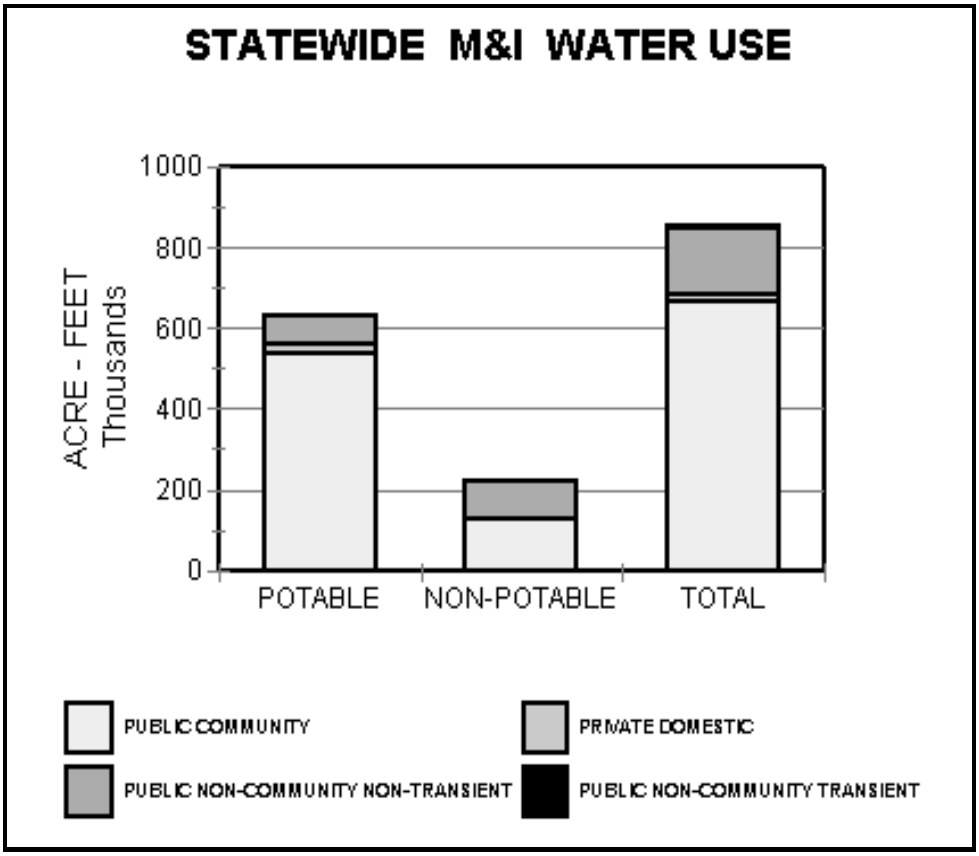


Figure 3-1 Statewide Total M&I Water Use
Note: Each graph scale varies - compare values only.

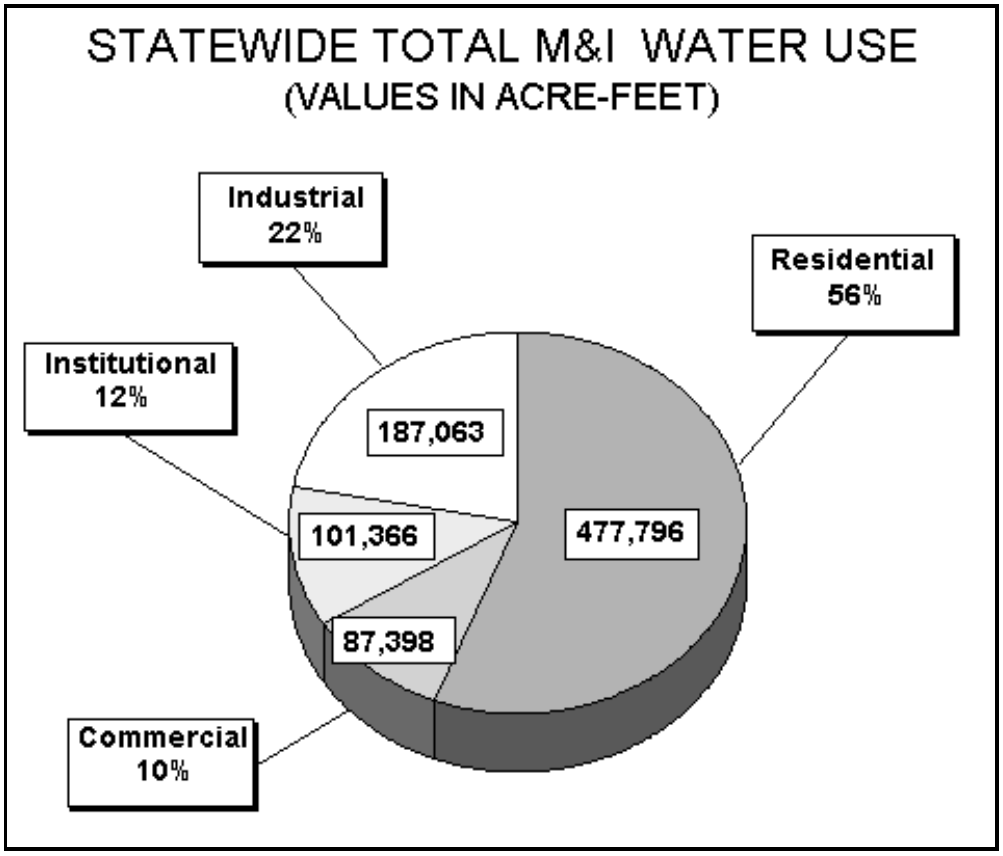


Figure 3-2 Statewide Categorical Total M&I Water Use

Figure 3-2 illustrates the summary of both potable and non-potable water use for each of the categories of residential, commercial, institutional, and industrial. The numbers reflect water delivered by all types of systems, including public community, public non-community, private domestic, and secondary irrigation. Again, the industrial use shown does not include the 250,961 acre-feet of saline water use from and around the Great Salt Lake. One can see why the inclusion of this categorical use would disproportionally affect even statewide water use statistics. Please refer to the Appendices for a more complete review of the state water use data, for the hydrologic basins as well as the counties of the state.

With the illustrated fact that the vast majority of water for M&I purposes is delivered through public community water systems, the remaining sections will focus exclusively on these systems, summarizing the data of the individual M&I reports and/or the previous section.

3.2 Public Community Water Systems - Statewide Source of Supply

As was shown **Section 2** of this report, water for public community systems generally is of three sources. Water withdrawn from wells is groundwater. Natural springs or artesian wells also have groundwater as their source. However, depending on the point at which the water is collected, it can also be considered a surface water source. For the purposes of the individual M&I studies, as well as this summary report, springs are considered as a separate source category, regardless of the technical classification of their waters. The remaining source of water is surface water. Surface water is that which is collected from rivers or through the impounded water of dams on the rivers, streams, lakes, and natural or constructed reservoirs along water courses. **Figure 3-3** illustrates the relative percentage of the source waters for all public community water systems of the state.

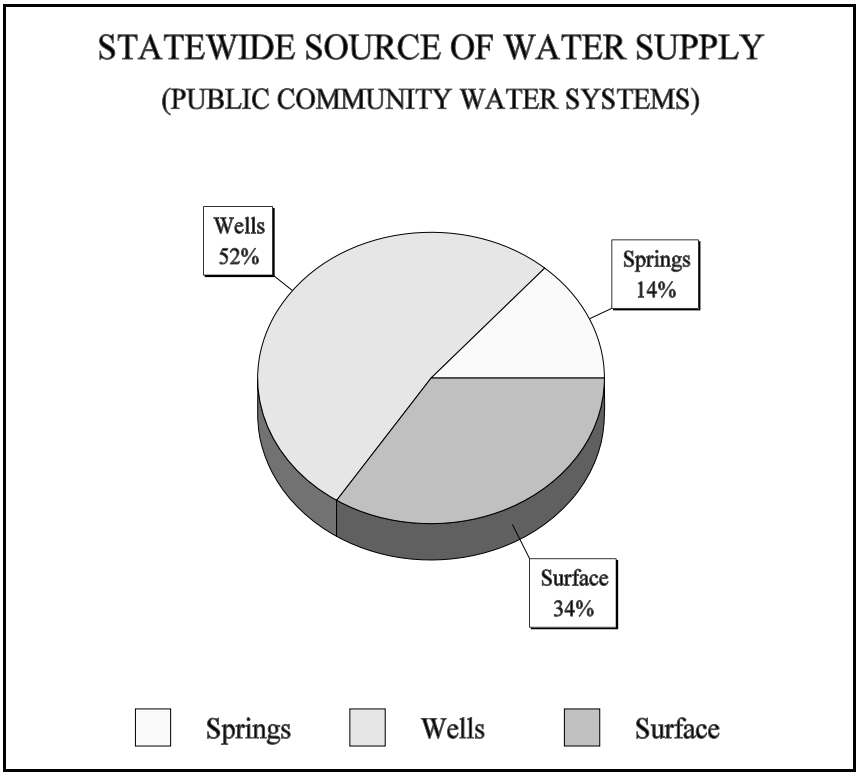


Figure 3-3 Statewide Summary of Water Supply Sources for Public Community Water Systems

As can be seen, just more than half of the water supply for public community systems in the state comes from wells or groundwater. Although most areas of the state are not depleting their groundwater resources, some developing and/or expanding communities are approaching and/or at times, exceeding the "safe" yield of the groundwater aquifers. For more specific and comprehensive information on the groundwater conditions of the state, please refer to the annual report entitled *Ground-Water Conditions in Utah* by the Utah Division of Water Resources, Utah Division of Water Rights, and the U.S. Geological Survey.

These sources of water for the public community systems must then be made available for use in the distribution systems. Whether the sources involve treatment of surface water, distribution of spring waters, or the withdrawal of groundwater by wells, all have legal and/or physical limitations. Using the most limiting factor on the source waters, the total estimated volume of water from the sources is defined as the maximum water supply available under present conditions. This total estimated maximum water supply for public community water systems of the state is 1,238,538 acre-feet.

Whatever source or sources of water the public community water system has, the water must then be distributed to the customers. The distribution system is designed to deliver the demanded flow of water during all times of the day, as well as the different seasons of the year. The highest demand time period is defined as the peak demand. Depending on the component of the delivery system being

designed, differing peak time periods are considered. The peak instantaneous, peak hour, and peak day demands (including fire fighting requirements) control the planning and design of the pumps, piping, and storage requirements of any water distribution system.

In the M&I reports, as well as this summary, the peak day demand is used as the basis for evaluating the capacity of a water system and/or the collective capacity of all the public community water systems of a hydrologic basin or county in the state. This capacity, defined as the reliable system source capacity, is the annual amount of water deliverable by the water system, on a consistent basis, according to demand. In general, surface and ground water sources are considered reliable to their maximum extent. Wells, however, are added as half of their maximum because of operational, systematic, and/or demand constraints which dictate how often and to what duration any one well can be used. The estimated combined total reliable system source capacities of all the public community water systems of the state is 828,033 acre-feet of water annually.

These maximum and reliable capacity or supply figures, when individually analyzed and/or compared with each other, give a snapshot view of the ability of the water systems of each basin to provide for their current and future customers. Using the reliable system source capacity, one can determine the total future estimated population that can be served, if further source development is necessary, and/or in what time period system improvements need to be made. This information can be used by managers and planners as an additional guide in establishing or reviewing long term plans and objectives of their respective systems and service areas.

3.3 Public Community Water Systems - Statewide Water Use

Collectively, the public community water systems of the state provide (or use) the combined single largest total annual amount of water at 666,805 acre-feet. These water systems provide the necessary supply to about 95 percent of the population in the state, for a variety of uses. The following **Figure 3-4** illustrates the statewide breakdown of public community water systems usage as per the categories of residential, commercial, institutional, and industrial.

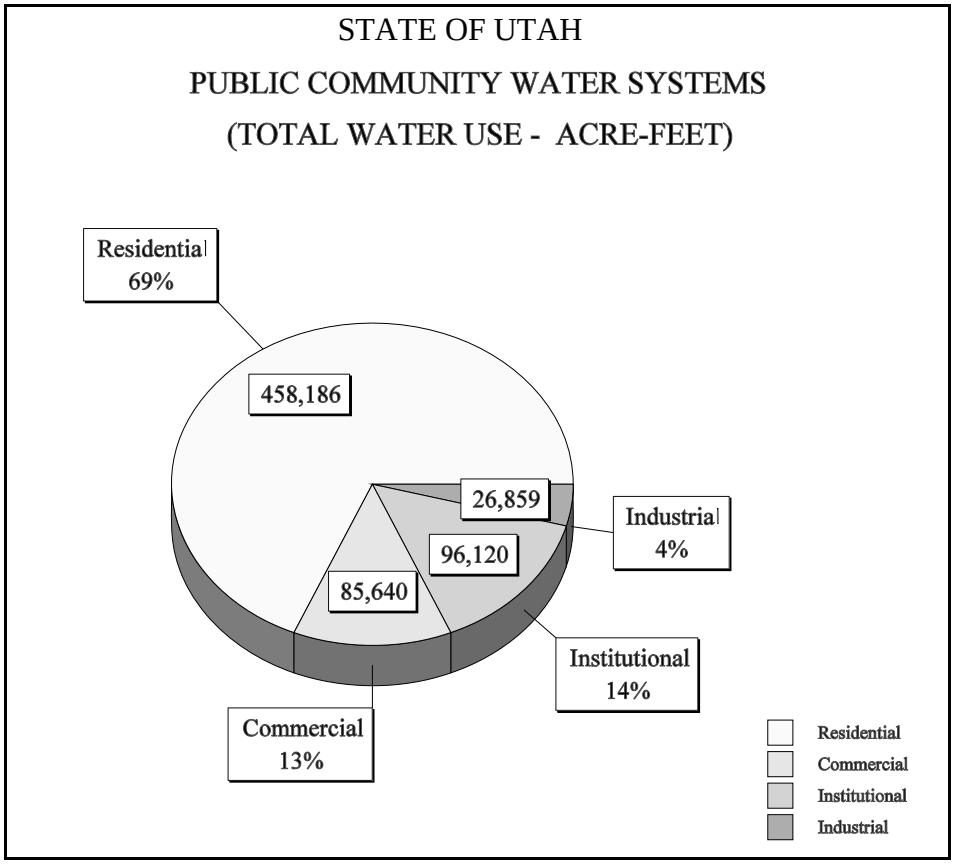


Figure 3-4 Statewide Public Community Systems Categorical Water Use

Particularly for public water supply systems, the amount of water delivered to or used per person per day is considered to be a standard comparative value. **Table A-4** of the Appendix shows the calculated gallons per capita per day (gpcd) for the categorical uses of potable and non-potable water for each of the hydrologic basins. The overall statewide figures for the time period of the data used in this report indicate an average statewide water usage rate of 293 gpcd for public community water systems. Of this, 202 gpcd is for residential uses, both indoor and outdoor. **Table 3-2** shows the categorical total water use and the per-capita water use rates for public community water systems in the state of Utah.

Table 3-2 Total and Per-capita Categorical Water Use of Public Community Systems of the State of Utah (combined basin population of 2,333,889)

Category		Total Use (Acre-Ft)	Rate (GPCD)
Potable Water Use:			
Residential		364,398	161
Commercial		74,852	33
Institutional		73,525	32
Industrial		26,292	11
	Sub Total	**539,067**	**237**
Non-Potable Water Use:			
Residential		93,788	41
Commercial		10,788	5
Institutional		22,595	10
Industrial		567	0
	Sub Total	**127,738**	**56**
TOTAL WATER USE:			
Residential		458,186	202
Commercial		85,640	38
Institutional		96,120	42
Industrial		26,859	12
	TOTAL	**666,805**	**293**

As for each of the individual water systems, counties or basins, the non-potable water use indicated in the tables is that which secondary irrigation systems supply only within the boundaries of the public community water system. The industrial use category indicates the industrial water supplied only by public community water systems and does not include the water used by non-community non-transient water systems, previously categorized as self-supplied industries.

In the overall picture, it can be seen that residential water use is not only the single largest categorical use of water from public community water systems, but is also greater than all other categorical uses combined. Therefore, all issues involving the supply or demand of the state's water resources for public community water systems need to include the collective water use and patterns of water use of all types of residential dwellings.

A report entitled *Identifying Residential Water Use*, published in 2000 by the Division of Water Resources, indicates that for the 13 Utah communities studied, indoor water use averaged 70 gpcd. Using this figure as an average for the entire state, the outdoor residential water use rate for the state would then be 132 gpcd, approximately two-thirds of the total residential water use rate. Additional studies have shown the outdoor use in commercial establishments and institutional facilities to be about 20 percent and 80 percent, respectively, of their total water use. Refer to the following **Table 3-3** for the indoor/outdoor water use breakdown for public community water systems in the State of Utah.

Table 3-3 Indoor/Outdoor Total and Per-capita Water Use of Public Community Systems of the State of Utah (combined basin population of 2,333,889)

Category	Potable		Non-Potable		TOTALS GPCD
	Ac-Ft/Yr	GPCD	Ac-Ft/Yr	GPCD	
Residential:					
Indoor	157,898	70	0	0	70
Outdoor	206,500	91	93,788	41	132
Commercial:					
Indoor	59,882	26	0	0	26
Outdoor	14,970	7	10,788	5	11
Institutional:					
Indoor	14,705	6	0	0	6
Outdoor	58,820	26	22,595	10	36
Industrial:					
Indoor	26,292	11	0	0	11
Outdoor	0	0	567	0	0
TOTALS:					
Indoor	258,777	114	0	0	113
Outdoor	280,290	124	127,738	56	180
Statewide Totals	**539,067**	**238**	**127,738**	**56**	**293**

The table shows that while the residential indoor/outdoor water use breakdown is about one third inside use and two thirds outdoor use, the total M&I water use breakdown is closer to 40% indoor use and 60% outdoor use.

APPENDIX A
HYDROLOGIC BASIN DATA TABLES

For reference: following is a map of the hydrologic basins in the state:

List of Tables:

Table A-1: Hydrologic Basin Total M&I Categorical Water Use
Table A-2: Hydrologic Basin M&I Categorical Water Use
Table A-3: Hydrologic Basin Total Potable and Non-Potable Water Use
Table A-4: Hydrologic Basin Public Community Systems - Categorical Per Capita Water Use

TABLE A-1
STATE OF UTAH
HYDROLOGIC BASIN TOTAL M&I CATEGORICAL WATER USE
(Figures may not add to totals due to independent rounding.)

Basin	Basin Category Totals (Acre-Feet)				Basin Grand Totals (Acre-Feet)
	Res	Com	Inst	Ind	
West Desert	5,811	525	3,303	14,483	24,122
Bear River	32,855	4,460	6,944	5,579	49,838
Weber River	103,336	15,002	25,591	25,858	169,787
Utah Lake	76,038	13,612	16,263	32,494	138,407
Jordan River	185,358	38,048	30,696	23,384	277,485
Sevier River	15,666	1,690	4,039	26,288	47,683
Cedar / Beaver	9,113	840	1,955	7,805	19,714
Uintah	8,882	900	2,446	12,199	24,427
West Colorado River	11,652	1,035	2,292	36,244	51,223
Southeast Colorado River	4,535	752	1,128	2,109	8,524
Kanab Creek / Virgin River	24,550	10,535	6,709	619	42,413
STATEWIDE	**477,796**	**87,398**	**101,366**	**187,063**	**853,623**

NOTES: 1. All values are combined potable and non-potable water amounts.
2. Industrial uses of saline water totaling 80,000 acre-feet in the Weber River and 170,961 acre-feet in the West Desert basins are not included.

TABLE A-2
STATE OF UTAH
HYDROLOGIC BASIN M&I CATEGORICAL WATER USE

(Figures may not add to totals due to independent rounding.)

Basin	Public Community (Values in Acre-Feet)					Public Non-Community Non-Transient (Values in Acre-Feet)					Public Non-Community Transient (Values in Acre-Feet)					Private Domestic (Acre-Feet)
	Res	Com	Inst	Ind	TOTAL	Res	Com	Inst	Ind	TOTAL	Res	Com	Inst	Ind	TOTAL	Res
West Desert	5,284	517	3,028	517	9,346	0	0	105	13,966	14,071	2	8	170	0	180	525
Bear River	29,071	4,419	4,053	3,713	41,255	13	1	2,752	1,866	4,632	271	40	139	0	450	3,500
Weber River	100,195	14,582	25,497	2,682	142,955	10	7	0	23,176	23,193	22	413	95	0	529	3,109
Utah Lake	73,338	12,854	16,198	5,751	108,140	0	0	0	26,739	26,739	64	758	65	5	892	2,636
Jordan River	180,800	37,821	29,693	10,744	259,057	0	0	194	12,641	12,835	58	227	809	0	1,094	4,500
Sevier River	13,828	1,629	3,458	1,171	20,085	10	0	13	25,118	25,140	149	62	568	0	778	1,680
Cedar / Beaver	8,419	806	1,861	290	11,376	4	15	14	7,515	7,548	28	19	80	0	127	663
Uintah	7,987	892	2,314	1,027	12,219	0	0	0	11,173	11,173	20	8	132	0	161	875
West Colorado River	11,357	1,015	2,271	360	15,003	0	0	0	35,884	35,884	40	21	21	0	81	255
Southeast Colorado River	3,468	645	1,085	79	5,276	0	0	0	2,030	2,030	62	108	43	0	213	1,005
Kanab Creek / Virgin River	24,442	10,462	6,662	527	42,093	1	48	0	92	142	67	25	47	0	139	40
STATEWIDE	**458,188**	**85,640**	**96,119**	**26,859**	**666,805**	**39**	**71**	**3,078**	**160,199**	**163,387**	**782**	**1,688**	**2,169**	**5**	**4,644**	**18,788**

NOTES: 1. All values are combined potable and non-potable water totals.
2. See **Table A-1** for basin and area categorical and grand totals.
3. Industrial uses of saline water totaling 80,000 acre-feet in the Weber River and 170,961 acre-feet in the West Desert basins is not included (public non-community non-transient).

TABLE A-3
STATE OF UTAH
HYDROLOGIC BASIN POTABLE AND NON-POTABLE M&I WATER USE

(Figures may not add to totals due to independent rounding.)

Basin	POTABLE WATER (Values in Acre-Feet)					NON-POTABLE WATER (Values in Acre-Feet)				TOTAL
		Non-Community		Private	Sub		Non-Community		Sub	
	Community	Non-Transient	Transient	Domestic	Total	Community	Non-Transient	Transient	Total	(Acre-Feet)
West Desert	7,927	14,068	180	525	**22,700**	1,419	3	0	**1,422**	**24,122**
Bear River	36,064	2,749	324	3,500	**42,637**	5,191	1,883	126	**7,201**	**49,838**
Weber River	85,052	3,038	323	3,109	**91,523**	57,904	20,155	206	**78,264**	**169,787**
Utah Lake	86,159	26,739	142	2,636	**115,676**	21,981	0	750	**22,731**	**138,407**
Jordan River	246,299	9,191	311	4,500	**260,302**	12,758	3,643	783	**17,184**	**277,485**
Sevier River	14,317	7,140	208	1,680	**23,345**	5,768	18,000	570	**24,338**	**47,683**
Cedar / Beaver	8,048	256	127	663	**9,094**	3,327	7,293	0	**10,620**	**19,714**
Uintah	9,590	4,173	116	875	**14,753**	2,629	7,000	45	**9,674**	**24,427**
West Colorado River	10,190	3,684	81	255	**14,211**	4,812	32,200	0	**37,012**	**51,223**
Southeast Colorado River	3,948	1,090	213	1,005	**6,256**	1,329	940	0	**2,269**	**8,524**
Kanab Creek / Virgin River	31,472	101	135	40	**31,748**	10,620	41	4	**10,665**	**42,413**
STATEWIDE	**539,067**	**72,228**	**2,160**	**18,788**	**632,242**	**127,738**	**91,158**	**2,484**	**221,381**	**853,623**

NOTE: Industrial uses of saline water totaling 80,000 acre-feet in the Weber River and 170,961 acre-feet in the West Desert basins is not included (public non-community non-transient).

TABLE A-4
HYDROLOGIC BASIN PUBLIC COMMUNITY SYSTEMS
CATEGORICAL GALLONS PER CAPITA PER DAY WATER USE

(Figures may not add to totals due to independent rounding.)

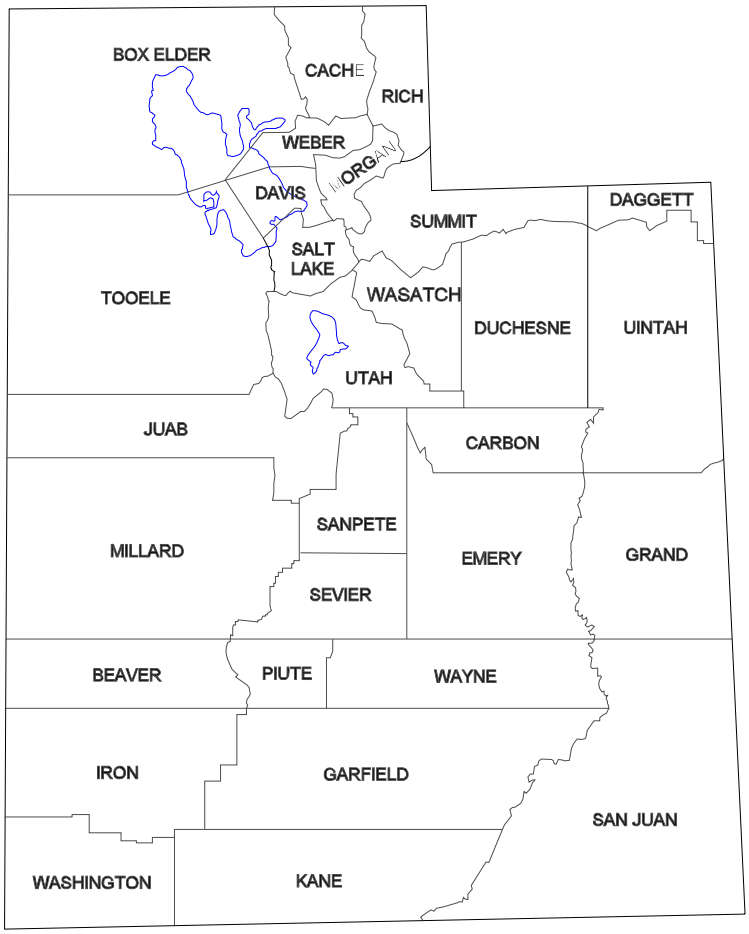
Basin	Population	Potable Water					Non Potable Water					TOTAL
		Res	Com	Inst	Ind	Subtotal	Res	Com	Inst	Ind	Subtotal	
West Desert	29,438	151	16	58	16	**240**	9	0	34	0	43	**283**
Bear River	126,418	183	28	18	26	**255**	22	4	11	0	37	**291**
Weber River	387,112	114	27	49	6	**196**	117	6	10	0	134	**330**
Utah Lake	354,000	144	24	36	13	**217**	41	8	5	1	54	**271**
Jordan River	879,850	177	36	26	11	**250**	7	3	4	0	12	**262**
Sevier River	47,815	171	30	44	22	**267**	87	0	21	0	108	**375**
Cedar / Beaver	26,541	219	22	20	10	**271**	64	5	42	0	112	**383**
Uintah	35,778	161	22	30	26	**239**	38	0	27	0	66	**305**
West Colorado River	36,523	186	25	29	9	**249**	91	0	26	0	118	**367**
Southeast Colorado River	16,466	157	35	18	4	**214**	31	0	41	0	72	**286**
Kanab Creek / Virgin River	85,535	209	93	22	5	**328**	46	17	48	0	111	**439**
STATEWIDE	**2,025,476**	**161**	**33**	**32**	**12**	**238**	**41**	**5**	**10**	**0**	56	**293**

NOTES: 1. Industrial uses of saline water totaling 80,000 acre-feet and 170,961 acre-feet in the Weber and West Desert basins, respectively, is not included.

2. There is less than 0.5 gallons per capita per day industrial non-potable water use in Sevier and Uintah counties.

APPENDIX B
COUNTY DATA TABLES

For reference: following is a map of the counties of Utah:
(See also **Table 1-1** to cross reference hydrologic basins and counties)



List of Tables:

Table B-1: County Total M&I Categorical Water Use
Table B-2: County Categorical M&I Water Use
Table B-3: County Categorical Potable and Non Potable Water Use
Table B-4: County Public Community Systems Per Capita Water Use

TABLE B-1
STATE OF UTAH
COUNTY TOTAL M&I CATEGORICAL WATER USE

County	County Category Totals (Acre-Feet)				County Grand Totals (Acre-Feet)
	Res	**Com**	**Inst**	**Ind**	
Beaver	1,980	275	524	7,161	9,939
Box Elder	9,831	1,045	1,764	3,047	15,687
Cache	22,150	3,157	5,086	3,246	33,639
Carbon	5,745	479	1,404	4,941	12,569
Daggett	405	46	133	14	598
Davis	49,772	3,349	15,863	3,481	72,465
Duchesne	2,660	201	837	726	4,423
Emery	4,456	183	692	31,165	36,496
Garfield	1,480	197	191	23	1,890
Grand	2,070	463	761	940	4,234
Iron	6,879	557	1,286	422	9,144
Juab	1,861	134	374	347	2,717
Kane	2,139	473	513	61	3,186
Millard	4,056	345	1,059	24,864	30,324
Morgan	1,856	405	117	840	3,219
Piute	443	29	108	53	634
Rich	989	286	121	6	1,401
Salt Lake	185,358	38,048	30,696	23,384	277,485
San Juan	2,074	270	367	1,119	3,830
Sanpete	5,131	217	1,564	995	7,906
Sevier	4,806	997	1,192	491	7,485
Summit	6,390	854	1,075	75	8,394
Tooele	5,504	495	3,245	13,763	23,006
Uintah	5,810	652	1,428	11,460	19,350
Utah	71,656	12,247	15,710	32,183	131,797
Wasatch	2,735	1,234	278	56	4,304
Washington	22,868	10,244	6,356	606	40,075
Wayne	895	117	62	133	1,207
Weber	45,798	10,400	8,561	21,462	86,221
STATEWIDE	**477,796**	**87,398**	**101,366**	**187,063**	**853,623**

NOTE: Industrial uses of saline water totaling 80,000 acre-feet in Weber county and 170,961 acre-feet in Tooele county is not included.

TABLE B-2
STATE OF UTAH
COUNTY CATEGORICAL M&I WATER USE

County	Public Community (Values in Acre-Feet)					Public Non-Community Non-Transient (Values in Acre-Feet)					Public Non-Community Transient (Values in Acre-Feet)					Private Domestic (Acre-Feet)
	Res	Com	Inst	Ind	TOTAL	Res	Com	Inst	Ind	TOTAL	Res	Com	Inst	Ind	TOTAL	Res
Beaver	1,775	249	502	229	**2,754**	1	15	0	6,933	**6,949**	27	11	22	0	**60**	177
Box Elder	8,667	1,014	1,717	1,329	**12,727**	0	0	13	1,718	**1,731**	14	31	34	0	**80**	1,150
Cache	19,940	3,147	2,291	2,398	**27,777**	9	1	2,752	848	**3,610**	0	9	42	0	**52**	2,200
Carbon	5,557	479	1,401	162	**7,599**	0	0	0	4,779	**4,779**	29	0	3	0	**31**	160
Daggett	389	43	116	14	**562**	0	0	0	0	**0**	1	3	18	0	**21**	15
Davis	48,272	3,349	15,863	1,307	**68,791**	0	0	0	2,174	**2,174**	0	0	0	0	**0**	1,500
Duchesne	2,094	197	789	688	**3,768**	0	0	0	38	**38**	6	4	47	0	**58**	560
Emery	4,449	182	689	62	**5,382**	0	0	0	31,103	**31,103**	2	1	4	0	**6**	5
Garfield	1,331	145	170	20	**1,666**	10	0	13	3	**26**	14	51	8	0	**73**	125
Grand	1,674	446	747	0	**2,867**	0	0	0	940	**940**	6	18	14	0	**37**	390
Iron	6,384	548	1,199	62	**8,193**	0	0	0	360	**360**	4	8	88	0	**100**	491
Juab	1,803	134	355	140	**2,432**	0	0	4	207	**211**	13	0	16	0	**28**	45
Kane	2,104	410	501	61	**3,076**	1	48	0	0	**49**	14	15	12	0	**41**	20
Millard	3,368	345	859	257	**4,828**	3	0	14	24,607	**24,624**	0	0	187	0	**187**	685
Morgan	1,201	29	69	13	**1,311**	0	0	0	827	**827**	15	376	49	0	**439**	641
Piute	358	26	100	53	**537**	0	0	0	0	**0**	0	3	9	0	**12**	85
Rich	646	286	71	6	**1,008**	0	0	0	0	**0**	143	0	50	0	**193**	200
Salt Lake	180,800	37,821	29,693	10,744	**259,057**	0	0	194	12,641	**12,835**	58	227	809	0	**1,094**	4,500
San Juan	1,415	181	336	29	**1,961**	0	0	0	1,090	**1,090**	59	89	30	0	**179**	600
Sanpete	4,429	211	1,221	465	**6,327**	0	0	0	530	**530**	102	6	342	0	**450**	600
Sevier	4,576	988	1,178	377	**7,119**	0	0	0	114	**114**	10	9	14	0	**33**	220
Summit	6,209	815	1,039	60	**8,123**	6	7	0	15	**28**	121	32	36	0	**190**	53
Tooele	5,064	489	2,994	496	**9,043**	0	0	88	13,266	**13,355**	0	6	162	0	**168**	440
Uintah	5,504	652	1,408	325	**7,889**	0	0	0	11,135	**11,135**	6	0	20	0	**26**	300
Utah	69,111	12,247	15,669	5,557	**102,584**	0	0	0	26,621	**26,621**	45	1	41	5	**91**	2,500
Wasatch	2,614	479	212	56	**3,362**	0	0	0	0	**0**	23	755	66	0	**844**	98
Washington	22,777	10,229	6,341	514	**39,861**	0	0	0	92	**92**	66	15	15	0	**96**	25
Wayne	830	111	62	133	**1,135**	0	0	0	0	**0**	0	7	0	0	**7**	65
Weber	44,847	10,390	8,528	1,302	**65,066**	8	0	0	20,160	**20,168**	5	10	33	0	**49**	938
TOTALS	**458,188**	**85,640**	**96,119**	**26,859**	**666,805**	**39**	**71**	**3,078**	**160,199**	**163,387**	**782**	**1,688**	**2,169**	**5**	**4,644**	**18,788**

NOTE: Industrial (non-community non-transient) saline water use of 170,961 and 80,000 acre-feet in Tooele and Weber counties, respectively, is not included

TABLE B-3
STATE OF UTAH
COUNTY CATEGORICAL POTABLE AND NON-POTABLE WATER USE

NOTE: Industrial (non-community non-transient) saline water use of 170,961 and 80,000 acre-feet in Tooele and Weber counties, respectively, is not included

County	POTABLE WATER (Values in Acre-Feet)					NON-POTABLE WATER (Values in Acre-Feet)				TOTAL
		Non-Community		Private	Sub		Non-Community		Sub	
	Community	Non-Transient	Transient	Domestic	Total	Community	Non-Transient	Transient	Total	(Acre-Feet)
Beaver	1,405	16	60	177	1,658	1,348	6,933	0	8,281	9,939
Box Elder	11,169	727	53	1,150	13,100	1,558	1,004	26	2,588	15,687
Cache	24,306	2,730	52	2,200	29,288	3,472	880	0	4,351	33,639
Carbon	6,278	2,579	31	160	9,048	1,321	2,200	0	3,521	12,568
Daggett	506	0	21	15	542	56	0	0	56	598
Davis	40,272	1,882	0	1,500	43,654	28,519	292	0	28,811	72,465
Duchesne	2,818	38	22	560	3,438	950	0	36	986	4,423
Emery	2,468	1,103	6	5	3,582	2,914	30,000	0	32,914	36,496
Garfield	1,070	26	73	125	1,294	596	0	0	596	1,890
Grand	2,163	0	37	390	2,591	704	940	0	1,644	4,234
Iron	6,174	0	100	491	6,765	2,019	360	0	2,379	9,144
Juab	2,053	211	28	45	2,337	380	0	0	380	2,717
Kane	2,266	8	41	20	2,335	810	41	0	851	3,186
Millard	3,762	6,624	7	685	11,078	1,067	18,000	180	19,247	30,324
Morgan	1,136	827	233	641	2,837	176	0	206	381	3,219
Piute	451	0	12	85	548	86	0	0	86	634
Rich	824	0	193	200	1,216	185	0	0	185	1,401
Salt Lake	246,299	9,191	311	4,500	260,302	12,758	3,643	783	17,184	277,485
San Juan	1,542	1,090	179	600	3,410	420	0	0	420	3,830
Sanpete	3,719	530	60	600	4,909	2,608	0	390	2,998	7,906
Sevier	5,355	114	33	220	5,722	1,763	0	0	1,763	7,485
Summit	6,350	13	90	53	6,506	1,773	15	100	1,888	8,394
Tooele	7,646	13,352	168	440	21,607	1,397	3	0	1,400	23,006
Uintah	6,266	4,135	17	300	10,717	1,624	7,000	9	8,633	19,350
Utah	81,820	26,621	91	2,500	111,032	20,764	0	0	20,764	131,797
Wasatch	2,523	0	94	98	2,715	839	0	750	1,589	4,304
Washington	30,091	92	92	25	30,300	9,770	0	4	9,774	40,075
Wayne	705	0	7	65	777	430	0	0	430	1,207
Weber	37,630	320	49	938	38,937	27,436	19,848	0	47,284	86,221
STATEWIDE	539,067	72,228	2,160	18,788	632,242	127,738	91,158	2,484	221,381	853,623

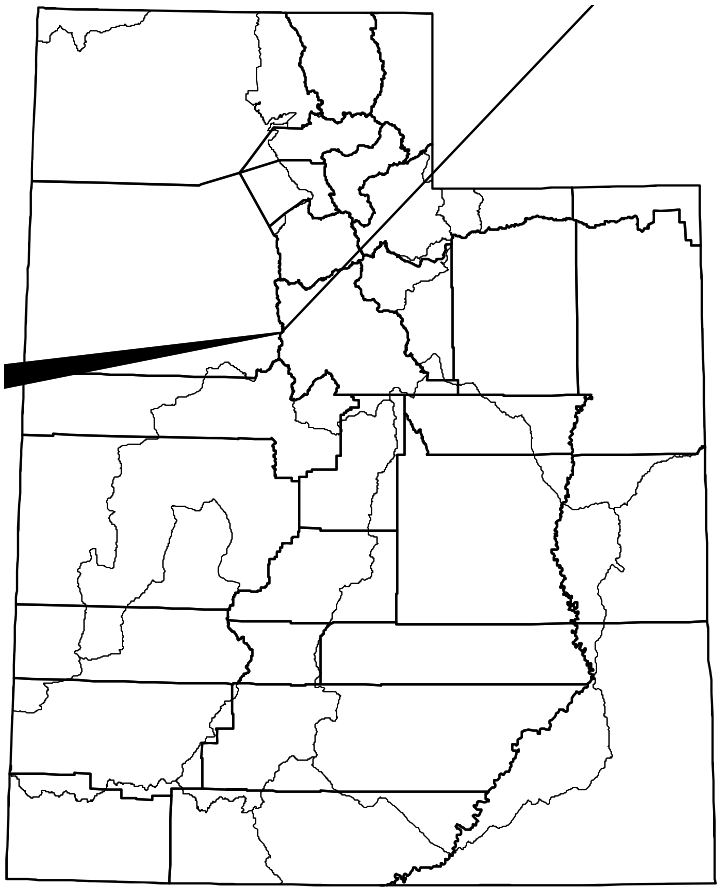
TABLE B-4
COUNTY PUBLIC COMMUNITY SYSTEMS
CATEGORICAL POTABLE AND NON-POTABLE PER CAPITA WATER USE

(All water use figures are gallons per capita per day)

		Potable Water					Non-Potable Water					
County	**Population**	**Res**	**Com**	**Inst**	**Ind**	**Subtotal**	**Res**	**Com**	**Inst**	**Ind**	**Subtotal**	**TOTAL**
Beaver	4,950	175	16	22	41	**253**	145	29	69	0	243	**497**
Box Elder	38,208	185	19	26	31	**261**	18	4	14	0	36	**297**
Cache	87,450	179	30	14	24	**248**	24	2	9	0	35	**284**
Carbon	20,784	200	21	42	7	**270**	39	0	18	0	57	**326**
Daggett	1,236	274	24	58	10	**366**	7	7	25	0	40	**406**
Davis	198,643	102	13	60	6	**181**	115	2	12	0	128	**309**
Duchesne	11,282	130	16	22	54	**223**	35	0	40	0	75	**298**
Emery	11,167	172	15	6	5	**197**	184	0	49	0	233	**430**
Garfield	3,797	181	34	31	5	**252**	132	0	9	0	140	**392**
Grand	7,345	188	54	20	0	**263**	15	0	70	0	86	**348**
Iron	20,676	226	24	14	3	**267**	49	0	38	0	87	**354**
Juab	8,105	162	15	34	15	**226**	36	0	5	0	42	**268**
Kane	7,848	159	47	45	7	**258**	80	0	12	0	92	**350**
Millard	9,365	228	33	73	25	**359**	93	0	9	0	102	**460**
Morgan	3,933	233	7	16	3	**258**	40	0	0	0	40	**298**
Piute	1,170	229	20	55	40	**344**	44	0	21	0	65	**409**
Rich	1,285	435	103	30	4	**572**	14	96	19	0	128	**700**
Salt Lake	879,850	177	36	26	11	**250**	7	3	4	0	13	**263**
San Juan	8,234	126	20	18	3	**167**	27	0	18	0	46	**213**
Sanpete	17,513	117	11	38	24	**190**	109	0	24	0	133	**322**
Sevier	16,823	175	52	37	20	**284**	68	0	25	0	94	**378**
Summit	20,503	225	15	34	3	**276**	45	21	11	0	77	**354**
Tooele	28,717	148	15	59	15	**238**	9	0	34	0	43	**281**
Uintah	23,260	170	25	33	12	**240**	41	0	21	0	62	**303**
Utah	336,337	143	25	37	13	**217**	41	8	5	2	55	**272**
Wasatch	10,147	178	21	18	5	**222**	52	21	1	0	74	**296**
Washington	79,957	213	96	21	6	**336**	41	18	50	0	109	**445**
Wayne	2,132	186	46	7	56	**295**	161	0	19	0	180	**475**
Weber	164,759	113	46	38	7	**204**	130	10	9	0	149	**353**
STATEWIDE	**2,025,476**	**161**	**33**	**32**	**12**	**238**	**41**	**5**	**10**	**0**	**56**	**293**

NOTE: Industrial (non-community non-transient) saline water use of 170,961 and 80,000 acre-feet in Tooele and Weber counties, respectively, is not included

APPENDIX C
COMBINED HYDROLOGIC BASIN AND COUNTY DATA TABLES



List of Tables:

Table C-1: Potable Water Use - Public Community Systems
Table C-2: Potable Water Use - Public Non Community Non Transient Systems
Table C-3: Potable Water Use - Public Non Community Systems
Table C-4: Non Potable Water Use - All Public Systems

TABLE C-1
STATE OF UTAH
PUBLIC COMMUNITY SYSTEMS POTABLE WATER USE

(Figures may not add to totals due to independent rounding.)

Counties	HYDROLOGIC BASINS (Values in Acre-Feet)											TOTAL
	West Desert Basin	Bear River Basin	Weber River Basin	Utah Lake Basin	Jordan River Basin	Sevier River Basin	Cedar/ Beaver Basin	Uintah Basin	West Colorado River Basin	Southeast Colorado River Basin	Kanab Creek/ Virgin River Basin	
Beaver	0	0	0	0	0	0	1,405	0	0	0	0	**1,405**
Box Elder	234	10,935	0	0	0	0	0	0	0	0	0	**11,169**
Cache	0	24,306	0	0	0	0	0	0	0	0	0	**24,306**
Carbon	0	0	0	0	0	0	0	0	6,278	0	0	**6,278**
Daggett	0	0	0	0	0	0	0	506	0	0	0	**506**
Davis	0	0	40,272	0	0	0	0	0	0	0	0	**40,272**
Duchesne	0	0	0	0	0	0	0	2,818	0	0	0	**2,818**
Emery	0	0	0	0	0	0	0	0	2,468	0	0	**2,468**
Garfield	0	0	0	0	0	503	0	0	404	163	0	**1,070**
Grand	0	0	0	0	0	0	0	0	49	2,114	0	**2,163**
Iron	0	0	0	0	0	0	6,105	0	0	0	69	**6,174**
Juab	13	0	0	1,481	0	559	0	0	0	0	0	**2,053**
Kane	0	0	0	0	0	0	0	0	189	226	1,851	**2,266**
Millard	33	0	0	0	0	3,729	0	0	0	0	0	**3,762**
Morgan	0	0	1,136	0	0	0	0	0	0	0	0	**1,136**
Piute	0	0	0	0	0	451	0	0	0	0	0	**451**
Rich	0	824	0	0	0	0	0	0	0	0	0	**824**
Salt Lake	0	0	0	0	246,299	0	0	0	0	0	0	**246,299**
San Juan	0	0	0	0	0	0	0	0	97	1,444	0	**1,542**
Sanpete	0	0	0	0	0	3,719	0	0	0	0	0	**3,719**
Sevier	0	0	0	0	0	5,355	0	0	0	0	0	**5,355**
Summit	0	0	6,014	336	0	0	0	0	0	0	0	**6,350**
Tooele	7,646	0	0	0	0	0	0	0	0	0	0	**7,646**
Uintah	0	0	0	0	0	0	0	6,266	0	0	0	**6,266**
Utah	0	0	0	81,820	0	0	0	0	0	0	0	**81,820**
Wasatch	0	0	0	2,523	0	0	0	0	0	0	0	**2,523**
Washington	0	0	0	0	0	0	538	0	0	0	29,553	**30,091**
Wayne	0	0	0	0	0	0	0	0	705	0	0	**705**
Weber	0	0	37,630	0	0	0	0	0	0	0	0	**37,630**
TOTAL	**7,927**	**36,064**	**85,052**	**86,159**	**246,299**	**14,317**	**8,049**	**9,590**	**10,190**	**3,948**	**31,472**	**539,067**

TABLE C-2
STATE OF UTAH
PUBLIC NON COMMUNITY NON TRANSIENT SYSTEMS POTABLE WATER USE

(Figures may not add to totals due to independent rounding.)

Counties	HYDROLOGIC BASINS (Values in Acre-Feet)											TOTAL
	West Desert Basin	Bear River Basin	Weber River Basin	Utah Lake Basin	Jordan River Basin	Sevier River Basin	Cedar/ Beaver Basin	Uintah Basin	West Colorado River Basin	Southeast Colorado River Basin	Kanab Creek/ Virgin River Basin	
Beaver	0	0	0	0	0	0	16	0	0	0	0	**16**
Box Elder	713	15	0	0	0	0	0	0	0	0	0	**727**
Cache	0	2,730	0	0	0	0	0	0	0	0	0	**2,730**
Carbon	0	0	0	0	0	0	0	0	2,579	0	0	**2,579**
Daggett	0	0	0	0	0	0	0	0	0	0	0	**0**
Davis	0	0	1,882	0	0	0	0	0	0	0	0	**1,882**
Duchesne	0	0	0	0	0	0	0	38	0	0	0	**38**
Emery	0	0	0	0	0	0	0	0	1,103	0	0	**1,103**
Garfield	0	0	0	0	0	23	0	0	3	0	0	**26**
Grand	0	0	0	0	0	0	0	0	0	0	0	**0**
Iron	0	0	0	0	0	0	0	0	0	0	0	**0**
Juab	4	0	0	118	0	89	0	0	0	0	0	**211**
Kane	0	0	0	0	0	0	0	0	0	0	8	**8**
Millard	0	0	0	0	0	6,385	239	0	0	0	0	**6,624**
Morgan	0	0	827	0	0	0	0	0	0	0	0	**827**
Piute	0	0	0	0	0	0	0	0	0	0	0	**0**
Rich	0	0	0	0	0	0	0	0	0	0	0	**0**
Salt Lake	0	0	0	0	9,191	0	0	0	0	0	0	**9,191**
San Juan	0	0	0	0	0	0	0	0	0	1,090	0	**1,090**
Sanpete	0	0	0	0	0	530	0	0	0	0	0	**530**
Sevier	0	0	0	0	0	114	0	0	0	0	0	**114**
Summit	0	4	9	0	0	0	0	0	0	0	0	**13**
Tooele	13,352	0	0	0	0	0	0	0	0	0	0	**13,352**
Uintah	0	0	0	0	0	0	0	4,135	0	0	0	**4,135**
Utah	0	0	0	26,621	0	0	0	0	0	0	0	**26,621**
Wasatch	0	0	0	0	0	0	0	0	0	0	0	**0**
Washington	0	0	0	0	0	0	0	0	0	0	92	**92**
Wayne	0	0	0	0	0	0	0	0	0	0	0	**0**
Weber	0	0	320	0	0	0	0	0	0	0	0	**320**
TOTAL	**14,068**	**2,749**	**3,038**	**26,739**	**9,191**	**7,140**	**256**	**4,173**	**3,684**	**1,090**	**101**	**72,228**

TABLE C-3
STATE OF UTAH
PUBLIC NON-COMMUNITY TRANSIENT SYSTEMS POTABLE WATER USE

(Figures may not add to totals due to independent rounding.)

Counties	HYDROLOGIC BASINS (Values in Acre-Feet)											TOTAL
	West Desert Basin	Bear River Basin	Weber River Basin	Utah Lake Basin	Jordan River Basin	Sevier River Basin	Cedar/ Beaver Basin	Uintah Basin	West Colorado River Basin	Southeast Colorado River Basin	Kanab Creek/ Virgin River Basin	
Beaver	0	0	0	0	0	0	60	0	0	0	0	**60**
Box Elder	12	41	0	0	0	0	0	0	0	0	0	**53**
Cache	0	52	0	0	0	0	0	0	0	0	0	**52**
Carbon	0	0	0	0	0	0	0	0	31	0	0	**31**
Daggett	0	0	0	0	0	0	0	21	0	0	0	**21**
Davis	0	0	0	0	0	0	0	0	0	0	0	**0**
Duchesne	0	0	0	0	0	0	0	22	0	0	0	**22**
Emery	0	0	0	0	0	0	0	0	6	0	0	**6**
Garfield	0	0	0	0	0	69	0	0	3	1	0	**73**
Grand	0	0	0	0	0	0	0	0	0	37	0	**37**
Iron	0	0	0	0	0	7	66	0	0	0	27	**100**
Juab	0	0	0	3	0	26	0	0	0	0	0	**28**
Kane	0	0	0	0	0	16	0	0	0	9	16	**41**
Millard	0	0	0	0	0	5	2	0	0	0	0	**7**
Morgan	0	0	233	0	0	0	0	0	0	0	0	**233**
Piute	0	0	0	0	0	12	0	0	0	0	0	**12**
Rich	0	193	0	0	0	0	0	0	0	0	0	**193**
Salt Lake	0	0	0	0	311	0	0	0	0	0	0	**311**
San Juan	0	0	0	0	0	0	0	0	14	165	0	**179**
Sanpete	0	0	0	0	0	58	0	0	2	0	0	**60**
Sevier	0	0	0	0	0	16	0	0	17	0	0	**33**
Summit	0	38	41	7	0	0	0	3	0	0	0	**90**
Tooele	168	0	0	0	0	0	0	0	0	0	0	**168**
Uintah	0	0	0	0	0	0	0	17	0	0	0	**17**
Utah	0	0	0	91	0	0	0	0	0	0	0	**91**
Wasatch	0	0	0	41	0	0	0	53	0	0	0	**94**
Washington	0	0	0	0	0	0	0	0	0	0	92	**92**
Wayne	0	0	0	0	0	0	0	0	7	0	0	**7**
Weber	0	0	49	0	0	0	0	0	0	0	0	**49**
TOTAL	**180**	**324**	**323**	**142**	**311**	**208**	**127**	**116**	**81**	**213**	**135**	**2,160**

TABLE C-4
STATE OF UTAH
ALL PUBLIC SYSTEMS NON-POTABLE M&I WATER USE

(Figures may not add to totals due to independent rounding.)

Counties	HYDROLOGIC BASINS (Values in Acre-Feet)											TOTAL
	West Desert Basin	Bear River Basin	Weber River Basin	Utah Lake Basin	Jordan River Basin	Sevier River Basin	Cedar/ Beaver Basin	Uintah Basin	West Colorado River Basin	Southeast Colorado River Basin	Kanab Creek/ Virgin River Basin	
Beaver	0	0	0	0	0	0	8,281	0	0	0	0	**8,281**
Box Elder	23	2,565	0	0	0	0	0	0	0	0	0	**2,588**
Cache	0	4,351	0	0	0	0	0	0	0	0	0	**4,351**
Carbon	0	0	0	0	0	0	0	0	3,521	0	0	**3,521**
Daggett	0	0	0	0	0	0	0	56	0	0	0	**56**
Davis	0	0	28,811	0	0	0	0	0	0	0	0	**28,811**
Duchesne	0	0	0	0	0	0	0	986	0	0	0	**986**
Emery	0	0	0	0	0	0	0	0	32,914	0	0	**32,914**
Garfield	0	0	0	0	0	243	0	0	148	205	0	**596**
Grand	0	0	0	0	0	0	0	0	0	1,644	0	**1,644**
Iron	0	0	0	0	0	0	2,339	0	0	0	40	**2,379**
Juab	0	0	0	378	0	2	0	0	0	0	0	**380**
Kane	0	0	0	0	0	0	0	0	0	0	851	**851**
Millard	0	0	0	0	0	19,247	0	0	0	0	0	**19,247**
Morgan	0	0	381	0	0	0	0	0	0	0	0	**381**
Piute	0	0	0	0	0	86	0	0	0	0	0	**86**
Rich	0	185	0	0	0	0	0	0	0	0	0	**185**
Salt Lake	0	0	0	0	17,184	0	0	0	0	0	0	**17,184**
San Juan	0	0	0	0	0	0	0	0	0	420	0	**420**
Sanpete	0	0	0	0	0	2,998	0	0	0	0	0	**2,998**
Sevier	0	0	0	0	0	1,763	0	0	0	0	0	**1,763**
Summit	0	100	1,788	0	0	0	0	0	0	0	0	**1,888**
Tooele	1,400	0	0	0	0	0	0	0	0	0	0	**1,400**
Uintah	0	0	0	0	0	0	0	8,633	0	0	0	**8,633**
Utah	0	0	0	20,764	0	0	0	0	0	0	0	**20,764**
Wasatch	0	0	0	1,589	0	0	0	0	0	0	0	**1,589**
Washington	0	0	0	0	0	0	0	0	0	0	9,774	**9,774**
Wayne	0	0	0	0	0	0	0	0	430	0	0	**430**
Weber	0	0	47,284	0	0	0	0	0	0	0	0	**47,284**
TOTAL	**1,422**	**7,201**	**78,264**	**22,731**	**17,184**	**24,338**	**10,620**	**9,674**	**37,012**	**2,269**	**10,665**	**221,381**

Note: Industrial uses of saline water totaling 80,000 acre-feet in the Weber River and 170,961 acre-feet in the West Desert basins is not included.

REFERENCES

Utah Division of Water Resources, *Municipal and Industrial Water Supply Studies*:

Bear River Basin (Division of Water Resources, 2001)

Beaver County, Iron County, and the Enterprise Areas (Hansen, Allen & Luce, Inc. for the Division of Water Resources, 1994, and as revised by DWR, 2000)

Columbia and Great Salt Lake Desert Basin (Division of Water Resources, 1998 and as revised, 2000)

Kanab Creek/Virgin River Basin (Division of Water Resources, 1998 and as revised, 2000)

Sevier River Basin (Division of Water Resources, 1998 and as revised, 2000)

Southeast Colorado River Basin (Division of Water Resources, 1998 and as revised, 2000)

Municipal and Industrial Water Supply, Use, and Rights in the Upper Jordan River Basin (Hansen, Allen & Luce, Inc. for the Division of Water Resources, 1995 and as revised by DWR, 2001)

Uintah Basin (Division of Water Resources, 1998 and as revised, 2000)

Weber River Basin (Division of Water Resources, 1996 and as revised, 2000)

West Colorado River Basin (Division of Water Resources, 1998 and as revised, 2000)

Utah Division of Water Resources, *Utah's Water Resources: Planning for the Future* (Division of Water Resources, 2001)

Hansen, Allen & Luce, Inc., *Municipal and Industrial Water Supply, Use and Rights in the Upper Jordan River Basin* (Salt Lake City, 1995)

Utah Division of Water Resources, *Water-Related Land Use Inventories: State Summary* (Division of Water Resources, 1999)

Utah Division of Water Resources, *Identifying Residential Water Use: Survey Results and Analysis of Residential Water Use for Thirteen Communities in Utah* (Salt Lake City: Division of Water Resources, 2000)

REFERENCES (Cont.)

Wayne B. Solley, Robert R. Pierce, and Howard A Pearlman, *Estimated Use of Water in the United States in 1995*, U.S. Geological Survey Circular 1200 (U.S. Department of the Interior, 1998)

Trevor C. Hughes and Robert Gross, *Domestic Water Demand in Utah*, Water Resources Planning Series UWRL/P-79/04 (Utah State University, 1979)

Utah Division of Water Resources, *Utah State Water Plan: Jordan River Basin* (Division of Water Resources, 1997)

State of Utah, Governor's Office of Planning and Budget, *Demographic and Economic Analysis 1990 - 1999*, Retrieved from the Internet, web page: www.governor.state.ut.us/dea/rankings/county/poprank_county99.htm