MUNICIPAL AND INDUSTRIAL
WATER SUPPLY AND USES
IN THE
WEST DESERT AND COLUMBIA RIVER BASINS

(Data Collected for Calendar Year 2005)

Prepared by

Utah Department of Natural Resources
Division of Water Resources

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Dennis J. Strong, Director

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EXECUTIVE SUMMARY

The purpose of this report is to document the municipal and industrial (M&I) water system supplies and uses within the West Desert and Columbia River Basins during the calendar year of 2005. These water systems deliver culinary (potable) and/or secondary (non-potable) water and have been separated into four categories, as defined on page 18 of this report. The four categories are public community, public non-community, self-supplied industrial and private domestic water systems. Water supplies, under the current hydrologic and each systematic condition, are evaluated for only potable water service in public community water systems. Since there are no community systems, non-community systems, or self-supplied industries in the Columbia Basin, the majority of this report pertains to information for the West Desert Basin. Private domestic systems in the Columbia River Basin within the State of Utah will be addressed in the discussion of Box Elder County. The small amount of use on Antelope Island in Davis County is addressed in the Weber River Basin report.

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

M&I water uses, for the basin, were then totaled and tabulated by county. Portions of nine counties comprise the Columbia River and West Desert Basins: Beaver, Box Elder, Davis, Iron, Juab, Millard, Salt Lake, Tooele, and Weber. No community or non-community systems are found within the Beaver, Davis, Iron, Salt Lake and Weber County portions of the West Desert Basin. However, the Beaver County portion of this basin does include some private domestic system use.

Public Community Water Systems

Of the aforementioned categories, public community systems serve about 95 percent of all residents in the State of Utah. Within the West Desert and Columbia River Basins, approximately 95 percent of the population is served by public

community water systems. Refer to **Figure 3** on page 6 for a location map of these systems, as well as the general boundaries of the basin.

For planning purposes, accurate and detailed current water use and supply information is invaluable in determining the ability of the basin to meet future water demands. The Division of Water Resources (DWRe) uses the annual reliable potable water supply, as defined on page 9, as a tool to quantify the amount of water that can be delivered by each public community water system to satisfy current and projected peak day demands with present water supply conditions.

In the West Desert and Columbia River Basins, it was determined that the current annual reliable potable water supply is 16,029 acre-feet. Springs account for 14 percent and wells 86 percent of this supply. Currently, there are no developed surface water sources in the basin. The breakdown of this supply is presented in the following **Table I**.

Table I
WEST DESERT AND COLUMBIA RIVER BASINS
Reliable Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

County	SPRINGS (Ac-Ft/Yr)	WELLS (Ac-Ft/Yr)	SURFACE (Ac-Ft/Yr)	TOTAL (Ac-Ft/Yr)
Box Elder	104.5	349.1	0.0	453.6
Juab	0.0	282.3	0.0	282.3
Millard	0.0	21.7	0.0	21.7
Tooele	2,184.6	13,086.5	0.0	15,271.1
GSL BASIN TOTALS	**2,289.1**	**13,739.6**	**0.0**	**16,028.7**

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

Table II, following, shows public community system water use data for both potable and non-potable categories within the West Desert and Columbia River Basins. Categorically, percentage of total water use is 28% residential indoor, 33% residential outdoor, 10% commercial, 26% institutional, and 3% light industrial/stockwatering.

TABLE II
WEST DESERT AND COLUMBIA RIVER BASINS
Water Use for Public Community Systems
(Acre-Feet/Year)

	Box Elder County	Juab County	Millard County	Tooele County	Total
Potable Use					
Residential Indoor	38.5	11.7	4.0	3,829.9	**3,884.1**
Residential Outdoor	82.9	4.4	10.0	3,087.7	**3,185.0**
Commercial	28.7	0.0	0.3	745.1	**774.1**
Institutional	38.3	0.2	7.4	2,427.3	**2,473.2**
Industrial/Stockwater	35.8	0.0	0.0	495.4	**531.2**
Total Potable	**224.2**	**16.3**	**21.7**	**10,585.4**	**10,847.6**
Secondary Use					
Residential	6.9	0.0	0.0	1,526.6	**1,533.5**
Commercial	0.0	0.0	0.0	557.6	**557.6**
Institutional	21.0	0.0	0.0	798.6	**819.6**
Industrial/Stockwater	0.0	0.0	0.0	14.5	**14.5**
Total Secondary	**27.9**	**0.0**	**0.0**	**2,897.3**	**2,925.2**
TOTAL WATER USE	**252.1**	**16.3**	**21.7**	**13,482.7**	**13,772.8**

In general, and specifically for this report, all per capita water use figures refer to the water use within public community water systems only. Out of a total basin population of 52,531 in 2005, 49,801 people were served by public community systems. For these systems, residential potable per capita water use was 127 gallons per capita per day (gpcd). Similarly, non-potable residential water use was 27 gpcd. The resultant total per capita water use was 154 gpcd for residential purposes within the public community systems of the basin. With the addition of water use in the commercial, institutional and industrial categories, the per capita water use for public community systems is 194 gpcd for potable and 53 gpcd for non-potable water, for an overall water use of approximately 247 gpcd. Comparatively, in 2005, the statewide average per capita water use was 190 gpcd potable and 70 gpcd

non-potable, for a total of 260 gpcd. The per capita water use values for various combinations of categories and types of water are shown in the following **Table III**.

TABLE III
WEST DESERT AND COLUMBIA RIVER BASINS
Average Per Capita Use
(Supplied by Public Community Systems)

CATEGORY	Average Per Capita Use (Ac-Ft/Yr)	Average Per Capita Use (GPCD)
Residential Potable Use	0.142	126.7
Residential Potable Plus Secondary Use	0.173	154.2
Total Potable Use	0.218	194.5
Total Potable Plus Secondary Use	0.277	246.9

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

Total M&I Water Use

Table IV, on the following page, shows the total potable and non-potable M&I water use for all system types in the West Desert Basin for the year 2005. Public community systems deliver the majority of the potable water within the basin. However, as in this basin, self-supplied industries can also use significant amounts of water. The table indicates that the total potable M&I water use in 2005 was 13,087 acre-feet. Total non-potable M&I water use in 2005 for the basin was about 3,391 acre-feet. There was an additional 158,000 acre-feet of saline water used for salt and other mineral recovery operations. The saline water is not included as a part of the secondary water use. Therefore, total M&I water use for all system categories and excluding saline water in 2005, for the West Desert basin, was about 16,478 acre-feet.

TABLE IV
WEST DESERT AND COLUMBIA RIVER BASINS
Total M&I Water Use for all Categories
(Acre-Feet/Year)

	Beaver County	Box Elder County	Juab County	Millard County	Tooele County	Total
Potable Use						
Public Community Systems	0.0	224.2	16.3	21.7	10,585.4	10,847.6
Public Non-Community Systems	0.0	31.8	0.9	0.0	592.9	625.6
Self-Supplied Industries	0.0	31.1	0.0	0.0	1,141.0	1,172.0
Private Domestic	1.0	85.3	14.0	28.0	313.8	442.1
Total Potable	1.0	372.4	31.2	49.7	12,633.1	13,087.3
Secondary Use						
Secondary Irrigation Companies	0.0	27.9	0.0	0.0	2,897.3	2,925.2
Public Non-Community Systems	0.0	12.9	12.0	0.0	0.0	24.9
Self-Supplied Industries	0.0	403.7	0.0	0.0	36.7	440.4
Total Secondary	0.0	444.5	12.0	0.0	2,934.0	3,390.5
TOTAL WATER USE	1.0	816.8	43.2	49.7	15,567.1	16,477.8

M&I Water Deliveries and Depletions

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

TABLE V
WEST DESERT AND COLUMBIA RIVER BASINS
M&I Deliveries and Depletions
(Acre-Feet/Year)

	Deliveries			Depletions		
County	Indoor Use	Outdoor Use	Total	Indoor Use	Outdoor Use	Total
Beaver	0.4	0.6	**1.0**	0.0	0.4	**0.4**
Box Elder	574.0	242.8	**816.8**	448.7	161.9	**610.6**
Juab	17.5	25.7	**43.2**	1.2	17.1	**18.3**
Millard	16.9	32.8	**49.7**	3.6	21.9	**25.5**
Tooele	6,787.3	8,779.8	**15,567.1**	3,146.1	5,853.2	**8,999.3**
Basin Totals	**7,396.1**	**9,081.7**	**16,477.8**	**3,599.7**	**6,054.5**	**9,654.1**

INTRODUCTION

Authority

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

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

Scope

The purpose of this report is to determine the M&I water supplies and uses within the West Desert and Columbia River Basins. The data presented in this report may be used in the State Water Plan for these basins as well as other DWRe reports and studies. Information considered for this report also includes related investigations recently completed by the DWRe and the Utah Division of Water Rights (DWRi).

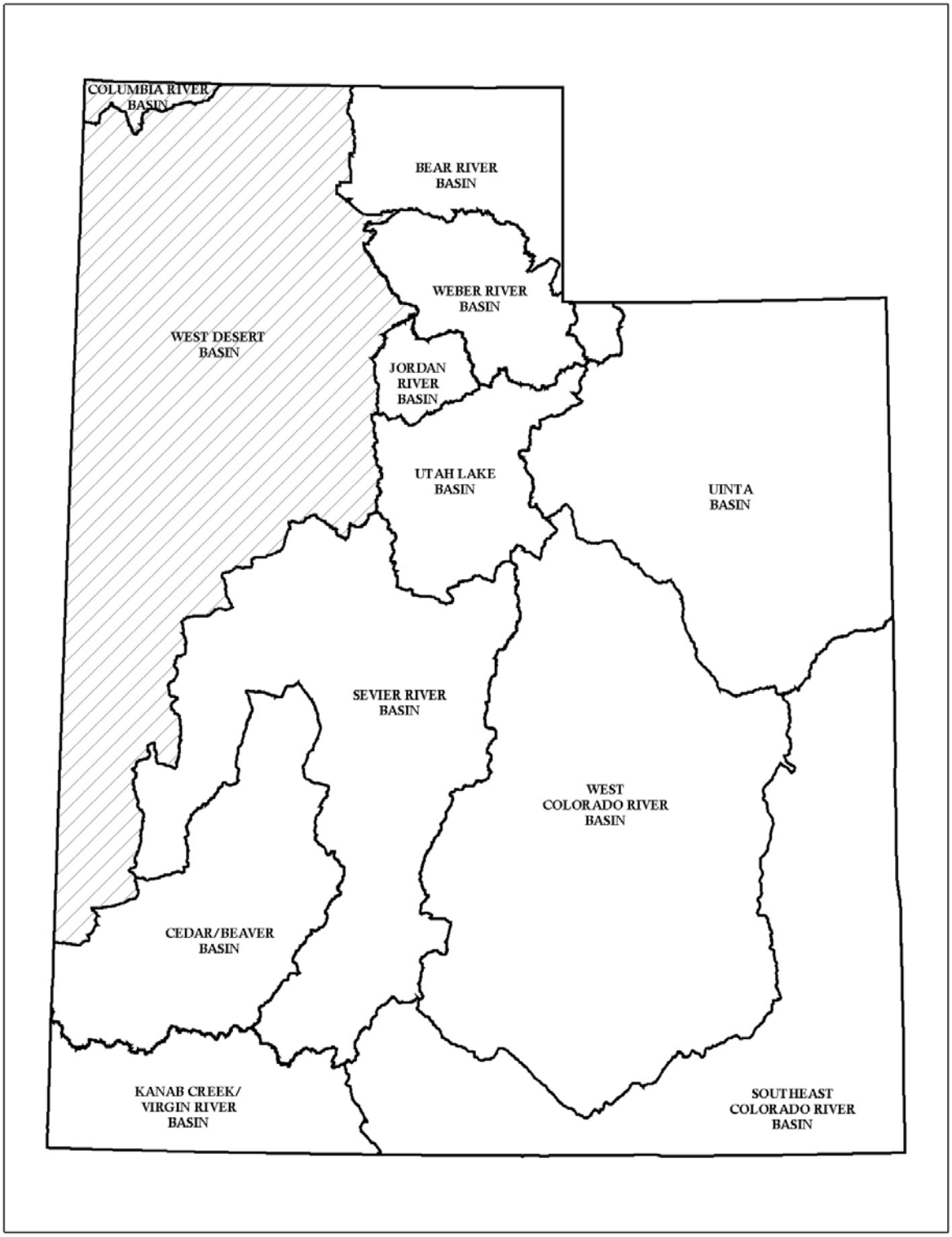


Figure 1. Location of West Desert and Columbia River Basins

Data Collection

This study was initiated in January 2008. The 2005 *Municipal and Industrial Water Use Forms,* distributed by the DWRe, in cooperation with the DWRi and the Utah Division of Drinking Water (DDW), were used as the basis for the study. In all counties, the data collection process is as described in the following section, *Water Supply and Use Methodology*. Water rights discussions presented herein were prepared based on information obtained from the DWRi.

General Description of the Basin

The West Desert Basin (including the Utah portion of the Columbia River Basin) includes approximately 18,000 square miles of land in the western portion of the state. About three-fourths of the Utah/Nevada state line forms the western boundary of the basin. About one-half of the Utah/Idaho state line forms the northern boundary of the basin. The following features bound the southeastern edge of the basin: Promontory Mountains, Great Salt Lake, Oquirrh Mountains, and Wah Wah Mountains.

The basin includes all or part of the following nine counties: Beaver, Box Elder, Davis, Iron, Juab, Millard, Salt Lake, Tooele, and Weber. However, most of the West Desert Basin portions of the Davis, Weber, and Salt Lake counties fall within the confines of the Great Salt Lake. There are no community, or non-community, systems located within the Beaver and Iron County portions of the basin.

The basin elevations vary from a high of 12,170 feet in the Tushar Mountains to a low of 4,560 feet where the Beaver River leaves the Escalante Valley drainage. Prominent features of this basin include the Great Salt Lake, the Bonneville Salt Flats, the Golden Spike National Monument, and the Dugway Proving Grounds. **Figure 2**, on page 5, is a detailed map of the basin.

The basin has 19 public community water systems. These systems serve 46,850 people (almost all of the total basin population of 52,531). In addition, the basin has 20 public non-community systems. These systems serve a National Monument, residential communities, churches, schools, commercial establishments, and roadside rest stops and military facilities. The basin also has 11 self-supplied industries. The locations of these systems are indicated on **Figure 3,** on page 6.

Water use through public community systems is steadily increasing within the basin, largely due to the accelerated growth of Tooele County. This growth can be attributed to Tooele's proximity to Salt Lake City and its lower housing prices.

Figure 2. West Desert Basin Drainage Map

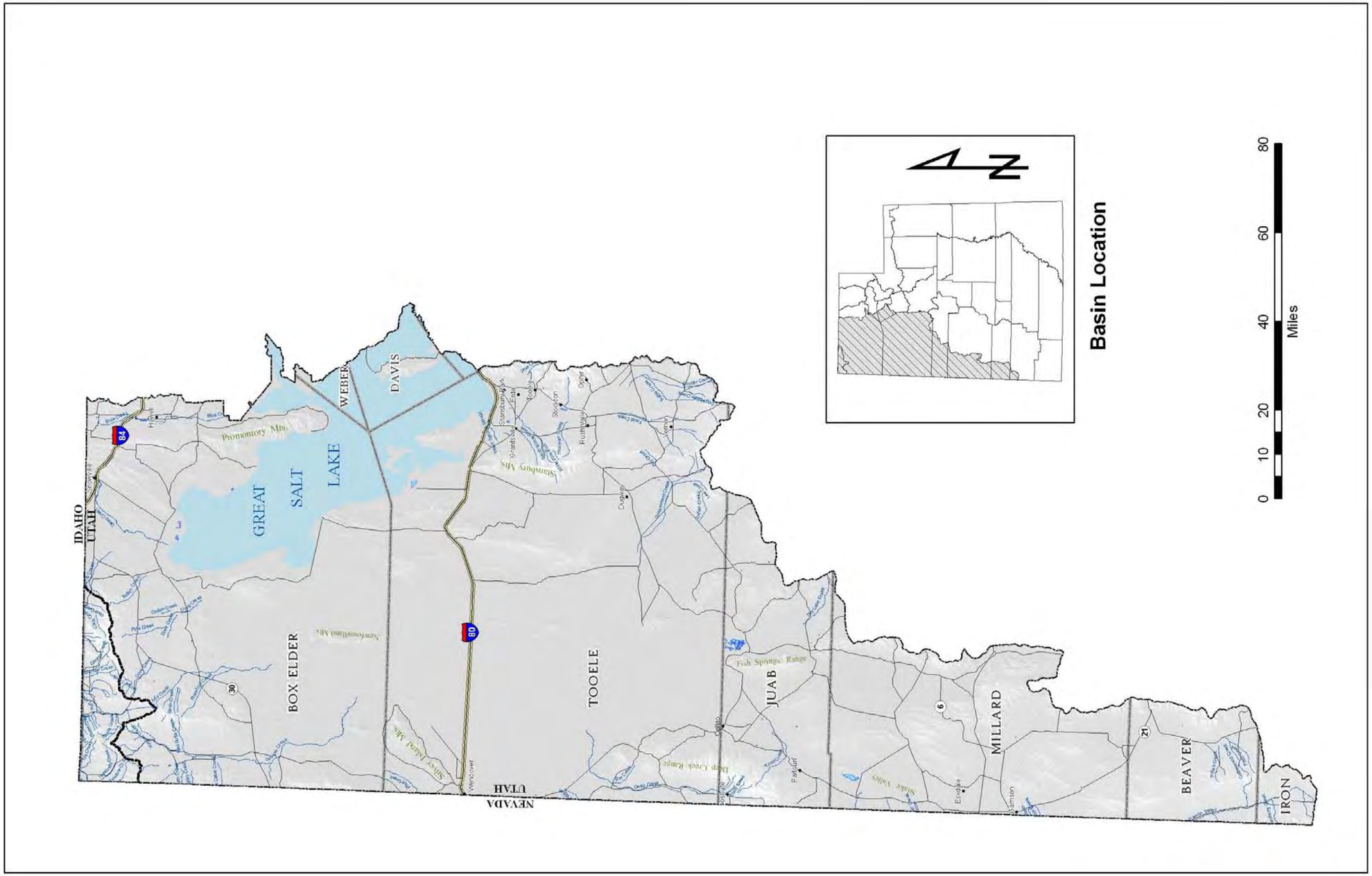
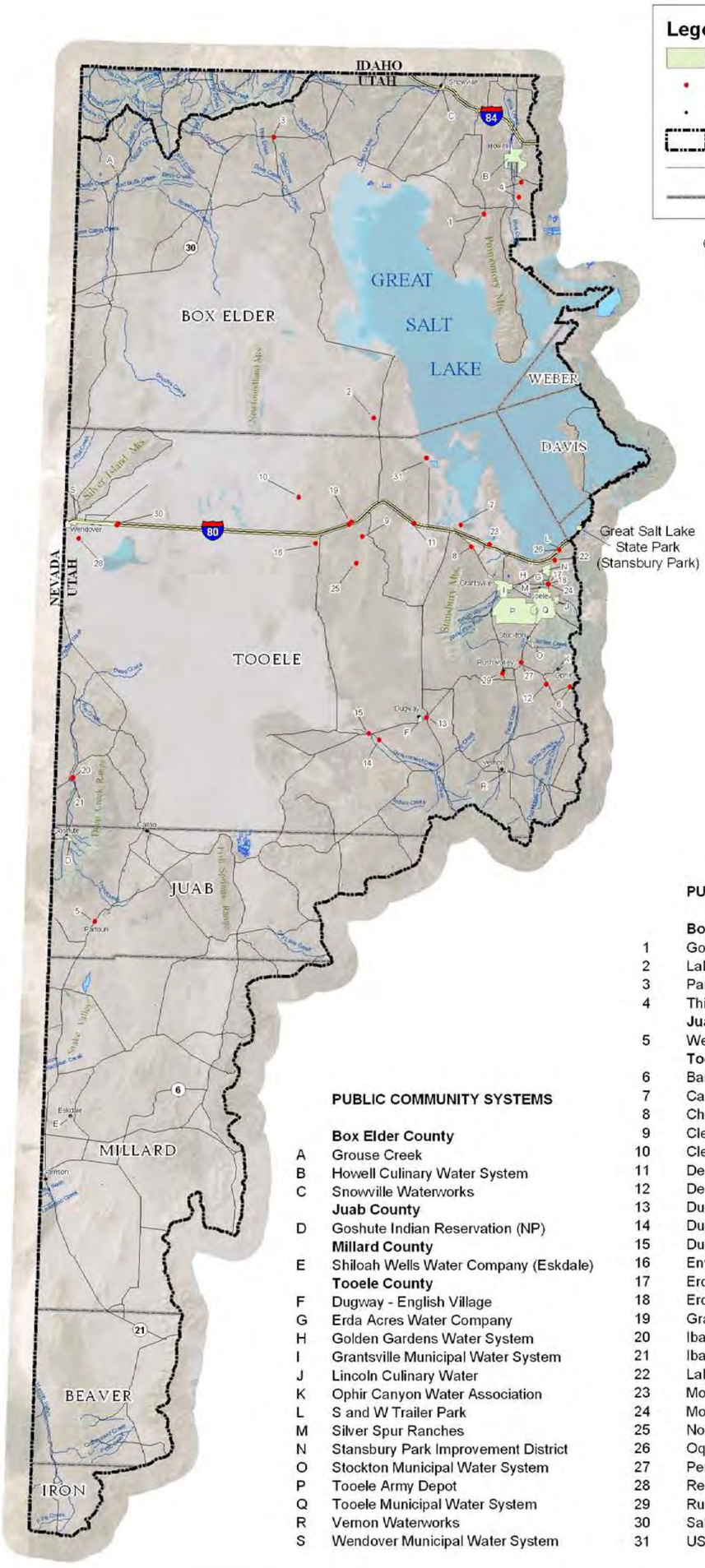

GREAT SALT LAKE
WEBER
DAVIS
BOX ELDER
TOOELE
JUAB
MILLARD
BEAVER
IRON
IDAHO
UTAH
NEVADA
UTAH
Promontory Mts.
Stansbury Mts.
Newfoundland Mts.
Silver Island Mts.
Fish Springs Range
Deep Creek Range
Snake Valley
Hilltop
Blue Creek
Tremonton
Garland
Bear River City
Corinne
Grantsville
Tooele
Stockton
Ophir
Rush Valley
Dugway
Wendover
Delta
Fillmore
Parowan
Enoch
Cedar City
Beaver
Minersville
Milford
Lynndyl
Eskdale
Jamison
Cedar Creek
Pine Creek
Deep Creek
Dry Lake Creek
Dry Creek
Snake Creek
Beaver Creek
Indian Creek
Pine Creek
Cedar Creek
Dry Creek
Deep

Figure 3. Locations of Public Community, Non-Community, and Self-Supplied Systems


Legend
Public Community Systems
Public Non-Community Systems
Municipalities
West Desert Basin Boundaries
Water Courses
County Line
N
0 5 10 20 30 40
Miles
IDAHO
UTAH
NEVADA
UTAH
BOX ELDER
GREAT
SALT
LAKE
WEBER
DAVIS
TOOELE
JUAB
MILLARD
BEAVER
IRON
Great Salt Lake
State Park
(Stansbury Park)
Wendover
Howell
Grantsville
Stockton
Rush Valley
Dugway
Vernon
Eskdale
Fillmore
Delta
Oak City
Lincoln
Ophir
Cedar Fort
Fairfield
Eureka
Lake Point
Tooele
Erda
Pomeroy Mts
Stansbury Mts
Silver Island Mts
Newfoundland Mts
Deep Creek Range
Pine Creek Range
Sevier Valley
Cedar Valley
Pavant Range
Tintic Valley
Sevier Lake
Dugway Range
Oquirrh Mts
Cedar Mts
Tooele Valley
Rush Valley
Skull Valley
Vernon Creek
Ophir Creek
Cedar Fort Creek
Fillmore Creek
Pine Creek
Deep Creek
Sevier Creek
Lincoln Creek
Dugway Creek
Oquirrh Creek
Tooele Creek
Erda Creek
Stansbury Creek
Rush Valley Creek
Vernon Creek
Cedar Creek
Sevier Lake Creek
Skull Valley Creek
Pavant Creek
Tintic Valley Creek
Sevier Valley Creek
Cedar Valley Creek
Fillmore Creek
Oak City Creek
Lake Point Creek
Eureka Creek
Fairfield Creek
Lincoln Creek
Ophir Creek
Cedar Fort Creek
Pine Creek
Deep Creek
Sevier

WATER SUPPLY AND USE METHODOLOGY

Background

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

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

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

Present Methodology for Community Water Systems

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

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

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

Water Supply

Potable Water

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

The lesser amount of water supply, due to these three constraints, is considered to be the maximum developed potable water supply available under present conditions used in this analysis.

The determination of well pump capacities, average annual 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 not within the scope of this study.

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

On page 11, **Figure 4** graphically presents the relationship between the maximum developed potable water supply and the reliable potable water supply of a system. By quantifying the maximum developed and the reliable potable water supply of a system, the total population that a system may potentially support can be determined. The current total yearly water use is the volume under the lower curve (*Present Water Use Pattern*). The future total yearly water use is the volume under the upper curve (*Future Water Use Pattern*). The latter volume is equivalent to the reliable developed potable water supply.

The maximum developed potable water supply under present conditions is the volume under the upper line (*Maximum Water Supply*) in **Figure 4**. This amount is a

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

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

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

Secondary Water

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

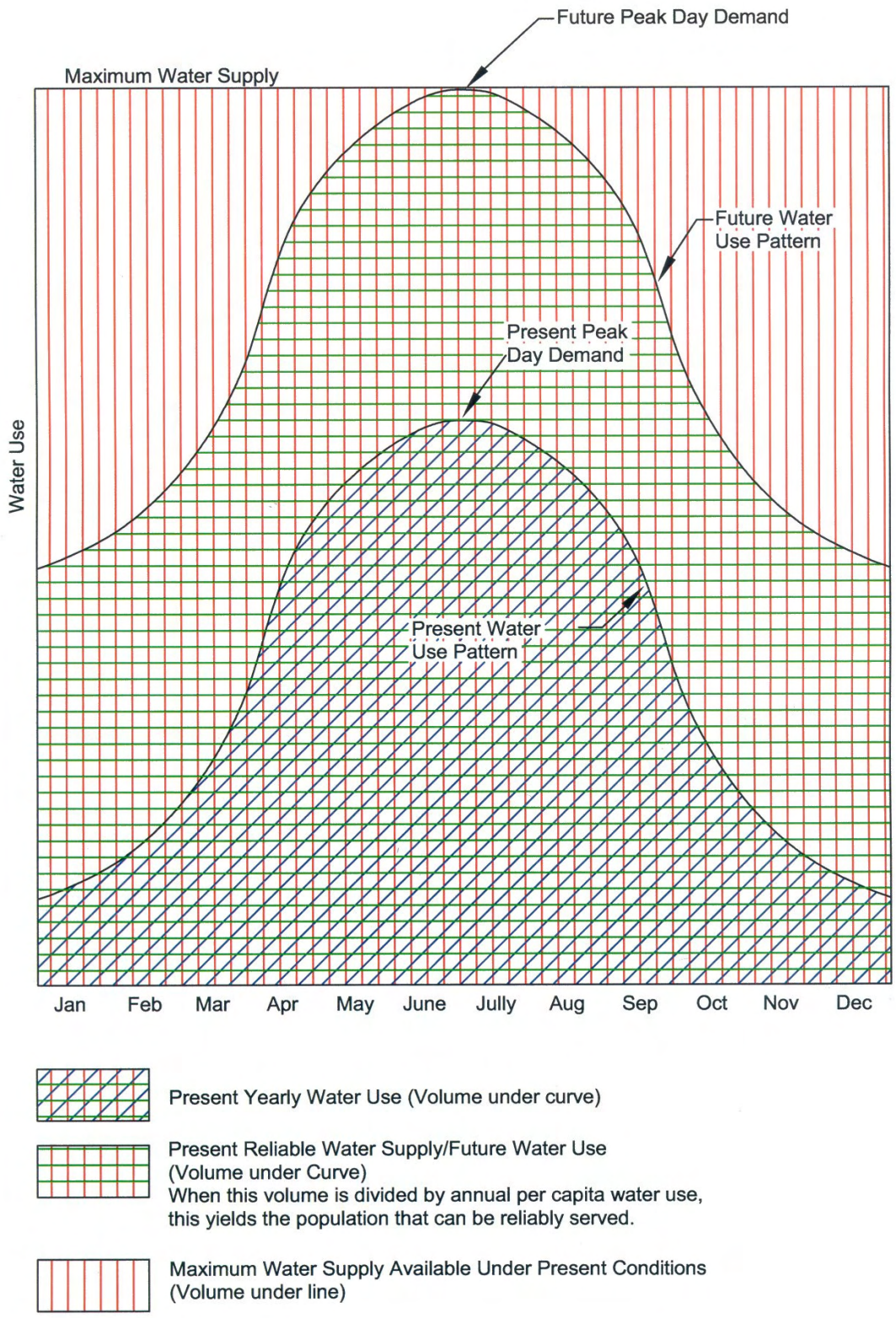


Figure 4. Water Supply and Use Hydrograph

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

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

Water Use

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

Residential

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

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

indoor use only. The winter water use is then used to determine the total yearly indoor use.

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

$$GPCD_{Indoor} = 90.3 / P_{PH} + 42.3$$

where:

$GPCD_{Indoor}$ = gallons per capita day (per capita indoor water use)

P_{PH} = persons per household (US Census Bureau)

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

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

Commercial

For most systems, the system operator can separate metered commercial water use data from the total water use. In cases where this data is not available, or is extremely difficult to obtain, the DWRe staff attempts to estimate commercial water use by inventorying commercial businesses in the area and using published commercial water use estimates. The DDW and the Utah State Water Lab, among others, publish these estimates. In some rural communities where there are a relatively small number of commercial connections, the businesses are visited individually by the DWRe staff and asked about their water use.

Some commercial facilities use secondary water to irrigate outside landscapes. This is especially typical for commercial golf courses. Again, it is typical that secondary water is not metered. The DWRe staff estimates this use by multiplying the size of the irrigated area by a water right-duty rate or the evapotranspiration (ET) rate with assumed application efficiency percentage. The ET used is indicative of the amount of water, in inches, necessary for turf growth.

Institutional

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

Industrial

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

Data Collection Methodology for Public Non-Community Water Systems

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

Data Collection Methodology for Self-Supplied Industrial Water Systems

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

Water use is acquired for self-supplied industries by using data from the DWRi's Industrial Water Use Form and/or electronically submitted data. The DWRi collects

annual water use data from most of the major self-supplied industrial water users in the state. This data is confidential. Therefore, the data presented in this M&I study is only presented as county totals. As with other non-community systems, the maximum and reliable water supplies are often not available and are not in the scope of this study. For planning purposes, the DWRe assumes that the water supply for these systems is equal to their water use.

Data Collection Methodology for Private Domestic Water Systems

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

DEFINITIONS OF WATER TERMS

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

Water Supply Terms

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

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

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

Types of Water

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

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

Water System Categories

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

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

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

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

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

Water Use Terms

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

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

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

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

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

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

Other Water Terms

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

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

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

Depletion - Water consumed and made unavailable for return to a given designated area, river system or basin. It is intended to represent the net loss to a system. The terms consumption and depletion are often used interchangeably but are not the

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

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

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

WATER RIGHTS IN THE WEST DESERT AND COLUMBIA RIVER BASINS

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

Deep Creek/Snake Valley/Southern Great Salt Lake Desert, Skull and Dugway Valleys (Areas 17, 18, &16)

Surface waters are open to appropriation if unappropriated sources with adequate supply and quality can be found. Most known sources of useable size have been appropriated.

Groundwater is open to appropriation. New filings are reviewed on their individual merits with emphasis on the potential for interference with existing rights. Suitable quality may be a problem in some areas.

Great Salt Lake Desert (Area 13)

Surface waters are limited and generally considered to be fully appropriated. Any new appropriations would be carefully reviewed on their individual merits. New surface diversions and uses must be accomplished by change applications filed on owned or acquired existing rights. Non-consumptive use applications, such as hydroelectric power generation, will be considered on their individual merits. Applications where the point of diversion is below the 4,210-foot elevation and around the Great Salt Lake require compliance with the leasing requirements of the Division of Forestry, Fire & State Lands and a State Engineer's determination of best public interest.

Valley locations are open for ground water applications; canyon areas above fully appropriated springs and streams are closed. However, there are some specific policies for certain areas, which are mentioned below. Filings for the domestic use of

one family, irrigation of 0.25 acres, and the watering of a reasonable number of livestock (total diversion of 1.73 acre-feet per year or less) are allowed throughout the area where there is no existing water system to supply residences. In some parts of the area, wells diverting up to 1.73 acre-feet/year for other uses could be allowed on an individually reviewed basis. Changes from surface to underground sources, and vice versa, are also considered on their individual merits, with emphasis on their potential to interfere with existing rights and to ensure that there is no enlargement of the underlying rights.

Hamblin Valley (Area 19)

Surface waters are considered to be fully appropriated. New surface diversions and uses must be accomplished by change applications filed on valid existing rights.

The State Engineer believes there is a limited amount of unappropriated water available in the aquifer system, and some development has occurred in the south end of the area. Domestic filings, limited to the requirements of one family, up to 10 head of livestock, and ¼ acre of irrigation (1.73 acre-feet or equivalent livestock) are individually reviewed for potential interference with existing water rights, and some have been approved.

Pine Valley (Area 14)

Surface waters are considered to be fully appropriated. New surface diversions and uses must be accomplished by change applications filed on valid existing rights.

The State Engineer believes there is a limited amount of unappropriated water available in the aquifer system, but the yield to wells has generally been small and the quality questionable. Domestic filings, limited to the requirements of one family, up to 10 head of livestock, and ¼ acre of irrigation (1.73 acre-feet) are individually reviewed for potential interference with existing water rights, and some have been approved.

Columbia River Tributaries (Area 11)

Surface waters are considered to be fully appropriated. New surface diversions and uses must be accomplished by change applications filed on owned or acquired

existing rights. Non-consumptive use applications, such as hydroelectric power generation, will be considered on their individual merits.

Valley locations are open for reasonable ground water applications (generally less than 2 cfs), canyon areas above fully appropriated springs and streams are closed. Changes from surface to underground sources, and vice versa, are also considered on their individual merits, with emphasis on their potential to interfere with existing rights and to ensure that there is no enlargement of the underlying rights.

Tooele & Rush Valleys (Area 15)

Surface waters are considered to be fully appropriated. New surface diversions and uses must be accomplished by change applications filed on owned or acquired existing rights. Non-consumptive use applications, such as hydroelectric power generation, will be considered on their individual merits. The only exception is for small amounts from sources that would otherwise flow to the Great Salt Lake.

Tooele Valley is closed to ground water appropriations except for the small amounts of shallow ground water (less than 10 feet from the surface) that would otherwise flow to the Great Salt Lake. New diversions and consumptive uses in other sources must be accomplished by change applications filed on owned or acquired rights. Rush Valley is open to small appropriations up to 0.1 cubic feet per second. Changes from surface to underground sources, and vice versa, are also considered on their individual merits, with emphasis on the existence of a hydrologic tie between the two sources, the potential for interference with existing rights and to ensure that there is no enlargement of the underlying rights. Non-consumptive use applications, such as hydroelectric power generation, will be considered on their individual merits.

BEAVER COUNTY M&I WATER SUPPLIES AND USES

The Beaver County portion of the West Desert Basin claims no incorporated communities. Also, there are no public community systems, public non-community systems nor self-supplied industries.

The following **Table 1** indicates water use for private domestic systems in this portion of the West Desert Basin. This use amounts to about 1 acre-foot of potable water and no secondary water.

TABLE 1
BEAVER COUNTY
Water Use for Public Non-Community Systems,
Self-Supplied Industries and Private Domestic Systems
(Acre-Feet/Year)

BEAVER COUNTY WATER SUPPLIER	POTABLE USAGE (Acre-Feet/Year)					Secondary Water Use
	Residential	Commercial	Institutional	Industrial/ Stockwater	Total Potable Use	
Non-Communities	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Self-Supplied Industries	0.0	0.0	0.0	0.0	0.0	0.0
Private Domestic	1.0	0.0	0.0	0.0	1.0	0.0
BEAVER COUNTY TOTALS	**1.0**	**0.0**	**0.0**	**0.0**	**1.0**	**0.0**

BOX ELDER COUNTY M&I WATER SUPPLIES AND USES

The Box Elder County portion of the West Desert Basin claims Grouse Creek and Snowville as its incorporated communities. Within this portion of the basin, there are 3 public community systems, 3 public non-community systems and 1 self-supplied industry. The locations of the public community, non-community and self-supplied systems are shown in **Figure 3,** on page 6.

As shown in Table 2, the maximum annual potable water supply for public community systems in this portion of Box Elder County is 803 acre-feet: about 13% from springs and 87% from wells.

TABLE 2
BOX ELDER COUNTY
Maximum Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Springs (Ac-Ft/Yr)	Wells (Ac-Ft/Yr)	Surface (Ac-Ft/Yr)	Total (Ac-Ft/Yr)
BOX ELDER				
Grouse Creek	72.6	24.2	0.0	96.8
Howell Water System	31.9	270.7	0.0	302.6
Snowville Waterworks	0.0	403.3	0.0	403.3
BOX ELDER TOTALS	**104.5**	**698.2**	**0.0**	**802.7**

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

The reliable potable water supply for public community systems in the Box Elder County portion of the West Desert Basin is 454 acre-feet. The reliable supply is 57% of the maximum supply. The breakdown of this supply is presented in **Table 3** on the following page.

TABLE 3
BOX ELDER COUNTY
Reliable Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	SPRINGS	WELLS*	SURFACE	TOTAL
BOX ELDER				
Grouse Creek	72.6	12.1	N/A	84.7
Howell Water System	31.9	135.4	0.0	167.3
Snowville Waterworks	0.0	201.7	0.0	201.7
BOX ELDER TOTALS	**104.5**	**349.1**	**0.0**	**453.6**

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

Table 4, below, shows the breakdown of potable water use for each public community system. This table indicates that for Box Elder County, the current annual use of 224 acre-feet of water (within the public community systems) is about 50% of the reliable supply.

TABLE 4
BOX ELDER COUNTY
Water Use for Public Community Systems

BOX ELDER COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	Total M&I		
Grouse Creek	3.2	13.8	0.1	3.0	11.2	31.3	30	931
Howell Water System	19.6	13.7	0.0	1.5	24.6	59.4	220	241
Snowville Waterworks	15.7	55.4	28.6	33.8	0.0	133.5	180	662
0 TOTALS	**38.5**	**82.9**	**28.7**	**38.3**	**35.8**	**224.2**	**430**	465
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H — Input data
G=B+C+D+E+F — Potable Water Use
I=G*(325,851 gallons per acre-foot)/(365 days per year)/H — Average gallons per capita per day potable water use

Table 5, below, presents the annual amount of secondary water used for various categories within the boundaries of the public community systems. In Box Elder County, the municipalities deliver secondary water within the public community systems. Total secondary use is estimated to be 28 acre-feet.

TABLE 5
BOX ELDER COUNTY
Secondary (Non-Potable) Water Use Within Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Residential Use	Commercial Use	Institutional Use	Industrial/ Stockwater Use	Total Secondary Use
BOX ELDER COUNTY					
Grouse Creek	3.0	0.0	18.0	0.0	21.0
Howell Water System	0.9	0.0	3.0	0.0	3.9
Snowville Waterworks	3.0	0.0	0.0	0.0	3.0
BOX ELDER COUNTY TOTALS	**6.9**	**0.0**	**21.0**	**0.0**	**27.9**

Table 6, below, presents various per capita rates for the public community systems in the Box Elder County portion of the West Desert Basin.

TABLE 6
BOX ELDER COUNTY
Average GPCD Water Use
for Public Community Systems

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Grouse Creek	30	506	89	**595**	426	536	**961**	931	625	**1,556**
Howell Water System	220	135	4	**139**	106	12	**118**	241	16	**257**
Snowville Waterworks	180	353	15	**368**	309	0	**309**	662	15	**677**
BOX ELDER COUNTY TOTALS	**430**	**252**	**14**	**266**	**213**	**44**	**257**	**465**	**58**	**523**

*Commmercial, Institutional, and Industrial

Table 7 indicates water use for public non-community, self-supplied industries and private domestic systems in this portion of the West Desert Basin. All of these uses amount to about 148 acre-feet of potable water and 417 acre-feet of secondary water.

TABLE 7
BOX ELDER COUNTY
Water Use for Public Non-Community Systems,
Self-Supplied Industries and Private Domestic Systems
(Acre-Feet/Year)

	POTABLE USAGE					Total Secondary Water Use (Ac-Ft/Yr)
	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Potable Use (Ac-Ft/Yr)	
BOX ELDER						
Non-Community System						
Golden Spike National Monument	0.4	0.0	1.2	0.0	**1.6**	**0.0**
Lakeside Range	0.0	0.0	20.2	0.0	**20.2**	**12.9**
Park Valley LDS Church	0.0	0.0	10.0	0.0	**10.0**	**0.0**
TOTALS	**0.4**	**0.0**	**31.4**	**0.0**	**31.8**	**12.9**
Self-Supplied Industries*	31.1	0.0	0.0	0.0	**31.1**	**403.7**
Private Domestic	85.3	0.0	0.0	0.0	**85.3**	**0.0**
pop.						
BOX ELDER TOTALS	**116.8**	**0.0**	**31.4**	**0.0**	**148.2**	**416.6**

* Thiokol Propulsion (Corporation)

Collectively, the total potable M&I water use from all systems in the BoxElder County portion of the West Desert Basin is about 372 acre-feet, while secondary use is 445 acre-feet; giving a total M&I water use of 817 acre-feet.

JUAB COUNTY M&I WATER SUPPLIES AND USES

The Juab County portion of the West Desert Basin claims no incorporated communities. Within this portion of the basin, there is one public community system, one public non-community system and no self-supplied industries. The locations of the public community and non-community systems are shown in **Figure 3** on page 6.

As shown in **Table 8**, the maximum annual potable water supply for public community systems in this portion of Juab County is 565 acre-feet: all of which comes from wells.

TABLE 8
JUAB COUNTY
Maximum Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Springs (Ac-Ft/Yr)	Wells (Ac-Ft/Yr)	Surface (Ac-Ft/Yr)	Total (Ac-Ft/Yr)
JUAB COUNTY				
Goshute Indian Reservation	0.0	564.6	0.0	564.6
JUAB COUNTY TOTALS	0.0	564.6	0.0	564.6

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

The reliable potable water supply for public community systems in the Juab County portion of the West Desert Basin is 282 acre-feet. The reliable supply is 50% of the maximum supply. The breakdown of this supply is presented in **Table 9,** on the following page.

TABLE 9
JUAB COUNTY
Reliable Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	SPRINGS (Ac-Ft/Yr)	WELLS* (Ac-Ft/Yr)	SURFACE (Ac-Ft/Yr)	TOTAL (Ac-Ft/Yr)
JUAB COUNTY				
Goshute Indian Reservation*	0.0	282.3	0.0	282.3
JUAB COUNTY TOTALS	0.0	282.3	0.0	282.3

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

Table 10, following, shows the breakdown of potable water use for each public community system. This table indicates that for Juab County, the current annual use of 16 acre-feet of water (within the public community systems) is about 6% of the reliable supply.

TABLE 10
JUAB COUNTY
Water Use for Public Community Systems

JUAB COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial/ Stockwater Total	TOTAL M&I		
JUAB COUNTY								
Goshute Indian Reservation	11.7	4.4	0.0	0.2	0.0	**16.3**	150	97
JUAB COUNTY TOTALS	**11.7**	**4.4**	**0.0**	**0.2**	**0.0**	**16.3**	**150**	**97**
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H — Input Data
G=B+C+D+E+F — Potable M&I Water Use
I=G*(325,851gallons per acre-foot)/(365 days per year)/H — Average gallons per capita per day potable water use

No secondary water is used within the Public Community Systems within this the West Desert Basin portion of Juab County.

Table 11 presents various per capita rates for the public community system in the Juab County portion of the West Desert Basin.

TABLE 11
JUAB COUNTY
Average GPCD Water Use
for Public Community Systems

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Goshute Indian Reservation	150	96	0	**96**	1	0	**1**	97	0	**97**
JUAB COUNTY TOTALS	**150**	**96**	**0**	**96**	**1**	**0**	**1**	**97**	**0**	**97**

*Commercial, Institutional and Industrial

Table 12, following, indicates annual water use for non-community, private domestic and self-supplied industry systems in this portion of the West Desert Basin. All of these uses amount to 15 acre-feet of potable water and 12 acre-feet of secondary water.

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

JUAB COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)					Total Secondary Water Use
	Residential	Commercial	Institutional	Industrial	Total Potable Use	
Non-Communities						
West Desert School	0.0	0.0	0.9	0.0	**0.9**	**12.0**
	0.0	**0.0**	**0.9**	**0.0**	**0.9**	**12.0**
Self-Supplied Industries	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Private Domestic	14.0	0.0	0.0	0.0	**14.0**	**0.0**
JUAB COUNTY TOTALS	**14.0**	**0.0**	**0.9**	**0.0**	**14.9**	**12.0**

Collectively, the total potable M&I water use from all systems in this portion of the West Desert Basin is about 31 acre-feet, while secondary use is 12 acre-feet; giving a total M&I water use of 43 acre-feet.

MILLARD COUNTY M&I WATER SUPPLIES AND USES

The Millard County portion of the West Desert Basin includes no incorporated communities. Within this area there is 1 public community system and a several private domestic wells. There are no non-community or self-supplied industry systems in this area. The location of the public community system is shown in **Figure 3** on page 6.

As shown in **Table 13,** the maximum annual potable water supply for public community systems in the West Desert portion of Millard County is 30 acre-feet; all of which comes from wells.

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

WATER SUPPLIER	Springs (Ac-Ft/Yr)	Wells (Ac-Ft/Yr)	Surface (Ac-Ft/Yr)	Total (Ac-Ft/Yr)
MILLARD COUNTY				
Shiloah Wells Water Co.	0.0	29.5	0.0	29.5
MILLARD COUNTY TOTALS	0.0	29.5	0.0	29.5

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

The reliable potable water supply for public community systems in the Millard County portion of the West Desert Basin is 22 acre-feet or 73% of the maximum supply. The breakdown of this supply is indicated in **Table 14** on the following page.

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

WATER SUPPLIER	SPRINGS (Ac-Ft/Yr)	WELLS* (Ac-Ft/Yr)	SURFACE (Ac-Ft/Yr)	TOTAL (Ac-Ft/Yr)
MILLARD COUNTY				
Shiloah Wells Water Co.*	0.0	21.7	0.0	21.7
MILLARD COUNTY TOTALS	0.0	21.7	0.0	21.7

* Reliable supply is equal to estimated use.

Table 15 presents the breakdown of the potable water use for the public community system. The current annual potable use is 22 acre-feet of water. The reliable potable water supply was determined to be equal to the current annual potable use.

TABLE 15
MILLARD COUNTY
Water Use for Public Community Systems

WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	TOTAL M&I		
MILLARD COUNTY								
Shiloah Wells Water Co.	4.0	10.0	0.3	7.4	0.0	21.7	50	387
MILLARD COUNTY TOTALS	**4.0**	**10.0**	**0.3**	**7.4**	**0.0**	**21.7**	**50**	**387**
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H — Input Data
G=B+C+D+E+F — Potable M&I Water Use
I=G*(325,851 gallons per acre-foot)/(365 days per year)/H — Average gallons per capita per day potable water use

Currently, there is no secondary use within the public community system of Shiloah Wells.

Various per capita rates for the public community system in the Millard County portion of the West Desert Basin are given in **Table 16,** on the following page.

TABLE 16
MILLARD COUNTY
Average GPCD Water Use
for Public Community Systems

WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons Per Capita Per day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	TOTAL M&I		
MILLARD COUNTY								
Shiloah Wells Water Co.	4.0	10.0	0.3	7.4	0.0	21.7	50	387
MILLARD COUNTY TOTALS	**4.0**	**10.0**	**0.3**	**7.4**	**0.0**	**21.7**	**50**	**387**
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H — Input Data
G=B+C+D+E+F — Potable M&I Water Use
I=G*(325,851 gallons per acre-foot)/(365 days per year)/H — Average gallons per capita per day potable water use

Table 17 indicates water use for private domestic systems in this portion of the West Desert Basin. All of these uses amount to about 28 acre-feet of potable water.

TABLE 17
MILLARD COUNTY
Water Use for Public Non-Community Systems, Self-Supplied Industries and Private Domestic Systems (Acre-Feet/Year)

	POTABLE USAGE					Total Secondary Water Use (Ac-Ft/Yr)
	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Potable Use (Ac-Ft/Yr)	
MILLARD COUNTY						
Non-Community Systems						
None	0.0	0.0	0.0	0.0	**0.0**	**0.0**
TOTALS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Self Supplied Industries						
None	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Private Domestic	28.0	0.0	0.0	0.0	**28.0**	**0.0**
pop.						
MILLARD COUNTY TOTALS	**28.0**	**0.0**	**0.0**	**0.0**	**28.0**	**0.0**

Collectively, the total potable M&I water use for all systems in Millard County is 50 acre-feet. There is no secondary use in this area. This amounts to a total M&I water use of 50 acre-feet for the county.

TOOELE COUNTY M&I WATER SUPPLIES AND USES

The Tooele County portion of the West Desert Basin includes the incorporated communities of Erda, Grantsville, Ophir, Rush Valley, Stansbury, Stockton, Tooele, Vernon, and Wendover. Within this area there is 14 public community systems, 16 public non-community systems, and many private domestic wells. There are 10 self-supplied industries in this area. Locations of the public community, non-community, and self-supplied systems are shown in **Figure 3** on page 6.

As shown in **Table 18,** the maximum annual potable water supply for public community systems in the West Desert portion of Tooele County is 28,277 acre-feet; 8% from springs and 92% from wells.

TABLE 18
TOOELE COUNTY
Maximum Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Springs	Wells	Surface	Total
TOOELE COUNTY				
Dugway - English Village	0.0	3,359.2	0.0	3,359.2
Erda Acres Water Company	0.0	282.2	0.0	282.2
Golden Garden Water System	0.0	42.4	0.0	42.4
Grantsville	0.0	4,876.6	0.0	4,876.6
Lincoln	64.5	0.0	0.0	64.5
Ophir	13.7	45.0	0.0	58.7
S & W Trailer Park	0.0	24.6	0.0	24.6
Silver Spur Ranchos	0.0	25.0	0.0	25.0
Stansbury Park Improvement District	0.0	5,083.5	0.0	5,083.5
Stockton	311.4	0.0	0.0	311.4
Tooele	362.9	11,168.4	0.0	11,531.3
Tooele Army Depot	0.0	1,028.0	0.0	1,028.0
Vernon	0.0	157.3	0.0	157.3
Wendover	1,432.1	0.0	0.0	1,432.1
TOOELE COUNTY TOTALS	2,184.6	26,092.1	0.0	28,276.8

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

The reliable potable water supply for public community systems in the Tooele County portion of the West Desert Basin is 15,271 acre-feet or 54% of the maximum supply. The breakdown of this supply is indicated in **Table 19** on the following page.

TABLE 19
TOOELE COUNTY
Reliable Potable Water Supplies for Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Springs	Wells *	Surface	Total
TOOELE COUNTY				
Dugway - English Village	0.0	1,679.6	0.0	1,679.6
Erda Acres Water Company	0.0	141.1	0.0	141.1
Golden Garden Water System	0.0	27.9	0.0	27.9
Grantsville	0.0	2,438.3	0.0	2,438.3
Lincoln	64.5	0.0	0.0	64.5
Ophir	13.7	22.5	0.0	36.2
S & W Trailer Park	0.0	12.3	0.0	12.3
Silver Spur Ranchos	0.0	46.2	0.0	46.2
Stansbury Park Improvement District	0.0	2,541.7	0.0	2,541.7
Stockton	311.4	0.0	0.0	311.4
Tooele	362.9	5,584.2	0.0	5,947.1
Tooele Army Depot	0.0	514.0	0.0	514.0
Vernon	0.0	78.7	0.0	78.7
Wendover	1,432.1	0.0	0.0	1,432.1
TOOELE COUNTY TOTALS	2,184.6	13,086.5	0.0	15,271.1

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

Table 20, on the following page, presents the breakdown of the potable water use for the public community systems. The current annual potable use for this portion of Tooele County is 10,585 acre-feet of water. This equates to 69% of the reliable supply.

TABLE 20
TOOELE COUNTY
Water Use for Public Community Systems

BEAVER COUNTY WATER SUPPLIER	POTABLE USAGE (Ac-Ft/Yr)						Service Population	Gallons PerCapita Per Day
	Residential Indoor	Residential Outdoor	Commercial Total	Institutional Total	Industrial Total	TOTAL M&I		
TOOELE COUNTY								
Dugway - English Village	141.1	124.8	0.0	239.7	178.8	684.4	1,150	**531**
Erda Acres Water Company	20.4	66.2	0.0	0.3	3.2	90.1	240	**335**
Golden Garden Water System	6.8	18.8	0.0	0.0	1.5	27.1	80	**302**
Grantsville Municipal Water System	564.6	115.4	206.6	86.2	58.2	1,031.0	7,210	**128**
Lincoln Culinary Water	47.1	19.3	0.0	7.5	0.8	74.7	720	**93**
Ophir Canyon Water Association	2.5	2.0	0.0	9.9	0.0	14.4	20	**643**
S & W Trailer Park	4.7	1.1	0.3	0.0	0.2	6.3	60	**94**
Silver Spur Ranchos	10.2	37.0	0.0	0.1	0.4	47.7	130	**328**
Stansbury Improvement District	485.4	533.1	34.9	548.4	6.1	1,607.9	6,170	**233**
Stockton Municipal Water System	51.0	230.7	2.0	4.9	0.3	288.9	730	**353**
Tooele Army Depot	35.3	0.0	0.0	543.7	27.6	606.6	450	**1,203**
Tooele Municipal Water System	2,352.3	1,881.8	369.6	940.9	201.6	5,746.2	30,550	**168**
Vernon Culinary Water Co.	15.7	27.5	1.4	1.7	1.4	47.7	200	**213**
Wendover Municipal Water System	92.8	30.0	130.3	44.0	15.3	312.4	1,450	**192**
TOOELE COUNTY TOTALS	**3,829.9**	**3,087.7**	**745.1**	**2,427.3**	**495.4**	**10,585.4**	**49,160**	**192**
A	B	C	D	E	F	G	H	I

A, B, C, D, E, F, H — Input Data
G=B+C+D+E+F — Potable M&I Water Use
I=G*(325,851 gallons per acre-foot)/(365 days per year)/H — Average gallons per capita per day potable water use

Table 21, on the following page, presents the annual amount of secondary water used for various categories within the boundaries of the public community systems. Both the municipalities and irrigation companies deliver secondary water within the public community systems. Total secondary use is estimated to be 2,897 acre-feet.

TABLE 21
TOOELE COUNTY
Secondary (Non-Potable) Water Use Within Public Community Systems
(Acre-Feet/Year)

WATER SUPPLIER	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Secondary Use (Ac-Ft/Yr)
TOOELE COUNTY					
Dugway - English Village	335.9	0.0	344.6	0.0	**680.5**
Erda Acres Water Company	0.0	0.0	0.0	0.0	**0.0**
Golden Garden Water System	0.0	0.0	0.0	0.0	**0.0**
Grantsville Municipal Water System					
Grantsville Irrigation	780.0	0.0	28.5	13.3	**821.8**
Lincoln					
Middle Canyon Irrigation	1.7	0.0	0.0	0.0	**1.7**
Ophir Canyon Water Association	0.0	0.0	0.0	0.0	**0.0**
S & W Trailer Park	0.0	0.0	0.0	0.0	**0.0**
Silver Spur Ranchos	0.0	0.0	0.0	0.0	**0.0**
Stansbury Improvement District	0.0	0.0	0.0	0.0	**0.0**
Stockton Municipal Water System					
Soldier Canyon	0.0	0.0	9.0	0.0	**9.0**
Tooele Army Depot	0.0	0.0	0.0	0.0	**0.0**
Tooele Municipal Water System					
Middle Canyon Irrigation	100.0	0.0	188.7	0.0	**288.7**
Settlement Canyon Irrigation	300.0	0.0	219.6	0.0	**519.6**
Tooele City Water Reuse System*	0.0	557.6	0.0	0.0	**557.6**
Vernon Culinary Water Co.					
Vernon Irrigation	9.0	0.0	8.2	1.2	**18.4**
Wendover Municipal Water System	0.0	0.0	0.0	0.0	**0.0**
TOOELE COUNTY TOTALS	**1,526.6**	**557.6**	**798.6**	**14.5**	**2,897.3**

* Reused water

Various per capita rates for the public community system in the Tooele County portion of the West Desert Basin are given in **Table 22** on the next page.

TABLE 22
TOOELE COUNTY
Average Per Capita Water Use for Public Community Systems

Water Supplier	Service Population	Residential Water Use			CII Water Use*			TOTAL WATER USE		
		Potable	Non-Potable	Sub Total	Potable	Non-Potable	Sub Total	Potable	Non-Potable	TOTAL
Dugway - English Village	1,150	206	261	**467**	325	268	**592**	531	528	**1,060**
Erda Acres Water Company	240	322	0	**322**	13	0	**13**	335	0	**335**
Golden Garden Water System	80	286	0	**286**	17	0	**17**	302	0	**302**
Grantsville Municipal Water System	7210	84	97	**181**	43	5	**49**	128	102	**229**
Lincoln Culinary Water	720	82	2	**84**	10	0	**10**	93	2	**95**
Ophir Canyon Water Association	20	201	0	**201**	442	0	**442**	643	0	**643**
S & W Trailer Park	60	86	0	**86**	7	0	**7**	94	0	**94**
Silver Spur Ranchos	130	324	0	**324**	3	0	**3**	328	0	**328**
Stansbury Improvement District	6170	147	0	**147**	85	0	**85**	233	0	**233**
Stockton Municipal Water System	730	345	0	**345**	9	11	**20**	353	11	**364**
Tooele Army Depot	450	70	0	**70**	1,133	0	**1,133**	1,203	0	**1,203**
Tooele Municipal Water System	30,550	124	12	**135**	44	28	**72**	168	40	**208**
Vernon Culinary Water Co.	200	193	40	**233**	20	42	**62**	213	82	**295**
Wendover Municipal Water System	1,450	76	0	**76**	117	0	**117**	192	0	**192**
BOX ELDER COUNTY TOTALS	**49,160**	**126**	**28**	**153**	**67**	**25**	**91**	**192**	**53**	**245**

*Commmercial, Institutional, and Industrial

Table 23, on the following page, indicates water use for public non-community, self-supplied industries, and private domestic systems in this portion of the West Desert Basin. All of these uses amount to about 2,048 acre-feet of potable water and 37 acre-feet of secondary water.

TABLE 23
TOOELE COUNTY
Water Use for Public Non-Community Systems, Self-Supplied Industries and Private Domestic Systems (Acre-Feet/Year)

	POTABLE USAGE					Total Secondary Water Use (Ac-Ft/Yr)
	Residential Use (Ac-Ft/Yr)	Commercial Use (Ac-Ft/Yr)	Institutional Use (Ac-Ft/Yr)	Industrial/ Stockwater Use (Ac-Ft/Yr)	Total Potable Use (Ac-Ft/Yr)	
TOOELE COUNTY						
Non-Community Systems						
Delle Auto Truck Stop	0.4	0.9	0.0	0.0	**1.3**	**0.0**
Deseret Chemical Depot	0.0	232.4	0.0	0.0	**232.4**	**0.0**
Dugway - Carr Facility	0.0	0.0	22.8	0.0	**22.8**	**0.0**
Dugway - Ditto Tech Center	0.0	0.0	215.8	0.0	**215.8**	**0.0**
Dugway Ward	0.0	0.0	3.9	0.0	**3.9**	**0.0**
Erda Center Water System	0.7	1.2	0.0	0.0	**1.9**	**0.0**
Erda Ward	0.0	0.0	3.5	0.0	**3.5**	**0.0**
Grassy Mountain Rest Stop	0.0	0.0	13.8	0.0	**13.8**	**0.0**
Ibapah LDS Church	0.0	0.0	1.3	0.0	**1.3**	**0.0**
Ibapah School	0.0	0.0	1.9	0.0	**1.9**	**0.0**
Lake Point Ward	0.0	0.0	1.8	0.0	**1.8**	**0.0**
Motor Vu Theater	0.0	0.1	0.0	0.0	**0.1**	**0.0**
Oquirrh Mountain Water Company	1.9	74.5	0.0	0.0	**76.4**	**0.0**
Penny's Café	0.8	0.3	0.0	0.2	**1.3**	**0.0**
Rush Valley LDS Church	0.0	0.0	2.2	0.0	**2.2**	**0.0**
Salt Flats Rest Stop	0.0	0.0	12.5	0.0	**12.5**	**0.0**
TOTALS	**3.8**	**309.4**	**279.5**	**0.2**	**592.9**	**0.0**
Self Supplied Industries*	1,139.5	0.0	0.0	1.5	**1,141.0**	**36.7**
Private Domestic	313.8	0.0	0.0	0.0	**313.8**	**0.0**
pop.						
TOOELE COUNTY TOTALS	**1,457.1**	**309.4**	**279.5**	**1.7**	**2,047.7**	**36.7**

* Chemical Lime Company (Chemstar), Envirocare of Utah, Inc. use secondary water.
Barrick Resources, Cargill Salt, Inc., Clean Harbors Aragonite, L.L.C., Clean Harbors Grassy Mountain, L.L.C., Morton International, Northeast Casualty Real Property, L.L.C., Reilly Industries, Wendover & US Magnesium, L.L.C. evaporate roughly 158,000 acre-feet of saline water for mineral extraction.

Collectively, the total potable M&I water use from all systems in this portion of the West Desert Basin is about 12,633 acre-feet, while secondary use is 2,934 acre-feet. This amounts to a total M&I water use of 15,567 acre-feet.

Roughly 158,000 acre-feet of saline water from the Great Salt Lake is used (evaporated) for the extraction of minerals from the water. This water is not counted in the M&I use.

APPENDIX A

LINCOLN WATER USE DATA FORM

AR: 1 2/17/04

Information jointly requested by:
Utah Division of Water Resources, 538-7264
Utah Division of Drinking Water, 536-4200; and
Utah Division of Water Rights, 538-7392.

UTAH WATER USE DATA FORM
DATA FOR 2003

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

System Name: Lincoln Culinary Water
Address: 1849 N Bluepeak Drive
Lincoln, UT 84074

Population Served: 484 DEQ#: 23009
County: Tooele
E-Mail Address: _____

Contact Person: Paul Kuester
Form filled out by: KEN SHIELDS

Phone Number: (435) 882-4829
Phone Number: 435-882-5739

RECEIVED
FEB 17 2004
DS
WATER RIGHTS
SALT LAKE

I. STORAGE INVENTORY: Total treated storage capacity: 200,000 in gallons. Number of Tanks: 1

II. SOURCE INVENTORY:

1 Source Name: Middle Canyon Well (8") Type: Well Location: Sec 06, T4S, R3W, SLB&M WR Number:
Method of Measurement: [ ] Master Meter, [ ] Estimate, [X] Other FLOW METER
Units of Measurement: _____ Rated Pump Capacity: _____ [ ] gpm, [ ] cfs
Date of Last Pump Test: _____ Yield of Well _____ [ ] gpm, [ ] cfs

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
0	0	0	0	.6	1.0	2.7	2.9	3.4	1.8	.8	.4	13.6

2 Source Name: Murray Springs Type: Spring Location: Sec 06, T3S, R3W, SLB&M WR Number: 15-2307
Method of Measurement: [ ] Master Meter, [ ] Estimate, [X] Other FLOW METER
Units of Measurement: _____
Are there any spills/overflow? [ ] Yes, [ ] No If yes, estimate annual quantity _____ Where is source measured? [ ] Before overflow, [ ] After overflow
When do spills/overflow occur? _____ Are spills/overflow included in the quantities reported? [ ] Yes [ ] No

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
.6	.7	1.0	1.0	1.1	1.0	.9	.9	.8	.6	.5	.5	9.6

3 Source Name: Springs-3 Angel Grove Type: Spring Location: Sec 35, T3S, R4W, SLB&M WR Number: 15-298
Method of Measurement: [ ] Master Meter, [ ] Estimate, [ ] Other _____
Units of Measurement: _____
Are there any spills/overflow? [ ] Yes, [ ] No If yes, estimate annual quantity _____ Where is source measured? [ ] Before overflow, [ ] After overflow
When do spills/overflow occur? _____ Are spills/overflow included in the quantities reported? [ ] Yes [ ] No

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
0	0	0	0	0	0	0	0	0	0	0	0	0.0

4 Source Name: Tooele City's Water Sys. Type: Location: Sec , T, R, SL&M WR Number:
Method of Measurement: [ ] Master Meter, [ ] Estimate, [ ] Other _____
Units of Measurement: _____

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
0	0	0	0	0	0	0	0	0	0	0	0	0.0

**** If you are using other sources which are not shown above, please enter the appropriate data in the space provided below. ****

5 Source Name: Type: Location: WR Number:
Method of Measurement: [ ] Master Meter, [ ] Estimate, [ ] Other _____
Units of Measurement: _____

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL

6 Source Name: Type: Location: WR Number:
Method of Measurement: [ ] Master Meter, [ ] Estimate, [ ] Other _____
Units of Measurement: _____

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL

7 Source Name: Type: Location: WR Number:
Method of Measurement: [ ] Master Meter, [ ] Estimate, [ ] Other _____
Units of Measurement: _____

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL

SOURCE COMMENTS: Water supply conditions were: [ ] Above normal, [ ] Below normal

_____

_____

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

Units of Measurement: GALLONS

Residential: Annual quantity of water delivered for residential purposes 19,964,670. Total number of residential connections 140.
Meter readings at individual connections [X]; or Estimated [ ]
Number of connections serving multiple units (apartments) from a single connection _____. Units per connection (avg) _____.

Commercial: Annual quantity of water delivered for commercial purposes _____. Total number of commercial connections _____.
Meter readings at individual connections [ ]; or Estimated [ ]

Industrial: Annual quantity of water delivered for industrial purposes _____. Total number of industrial connections _____.
Meter readings at individual connections [ ]; or Estimated [ ]

Institutional: Annual quantity of water delivered for institutional purposes 2,416,320. Total number of institutional connections 2.
Meter readings at individual connections [X]; or Estimated [ ]

Stockwatering: Annual quantity of water delivered for stockwatering purposes _____. Total number of stockwatering connections _____.
Meter readings at individual connections [ ]; or Estimated [ ]

Wholesale: Annual quantity of water delivered for wholesale purposes _____. Please attach a listing of those supplied.
Meter readings at individual connections [ ]; or Estimated [ ]

Other Uses: Annual quantity of water delivered for other purposes _____. Total number of other connections _____.
Meter readings at individual connections [ ]; or Estimated [ ]
Describe other uses _____.

Unmetered: Annual estimate of water delivered by unmetered connections _____. Total number of unmetered connections _____.
Unmetered connections used for _____.

Total annual quantity of water delivered for all purposes 22,380,990 **Total number of all connections** 142.
Of this total, how many connections are active? _____.

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

Is any of your area served by a separate ditch or pipe fed irrigation water system? [X] Yes, [ ] No If yes, please provide the following information:
What percent of your customers are served by a separate irrigation system? 10 %
Of these customers, what percent are served by ditch? 100 %
What percent are served by pressurized pipe? 0 %
Do you operate and maintain the separate lawn and garden irrigation water system? [ ] Yes, [ ] No
If the separate irrigation system is operated by other entities, please give name of companies, contact person & phone number:
MIDDLE CANYON IRRIGATION

APPENDIX B

2005 WEST DESERT BASIN
M&I DELIVERIES AND DEPLETIONS

2005 West Desert and Columbia River Basin M&I Deliveries and Depletions Table
(Acre-Feet/Year)

WATER SUPPLIER	Potable Residential Indoor Use	Potable Residential Outdoor Use	Potable Commercial Use	Potable Institutional Use	Potable Industrial/ Stockwater Use	Total Potable Use	Secondary Water Use	Total Indoor Use	Total Outdoor Use	Res. Indoor Return Flow	Commercial Indoor Return Flow	Institutional Indoor Return Flow	Industrial/ Stockwater Indoor Return Flow	Total Indoor Return Flow	Total Indoor to Treatment Facility	Pond Evaporation	Indoor Return Flow	Outdoor Return Flow	Total Return Flow	Total Deliveries	Total Depletion
BEAVER COUNTY																					
Non-community Systems	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0
Self Supplied Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0
Private Domestic Systems	0.4	0.6	0.0	0.0	0.0	1.0	0.0	0.4	0.6	0.4	0.0	0.0	0.0	0.4	***0.4***	0.0	0.4	0.2	0.6	1.0	0.4
COUNTY TOTALS	**0.4**	**0.6**	**0.0**	**0.0**	**0.0**	**1.0**	**0.0**	**0.4**	**0.6**	**0.4**	**0.0**	**0.0**	**0.0**	**0.4**	**0.4**	**0.0**	**0.4**	**0.2**	**0.6**	**1.0**	**0.4**
BOX ELDER COUNTY																					
Grouse Creek	3.2	13.8	0.1	3.0	11.2	31.3	21.0	15.1	37.2	3.1	0.1	0.6	0.0	3.8	***3.8***	0.0	3.6	12.4	16.0	52.3	36.3
Howell Water System	19.6	13.7	0.0	1.5	24.6	59.4	3.9	44.5	18.8	19.2	0.0	0.3	0.0	19.5	***19.5***	0.0	18.5	6.3	24.8	63.3	38.5
Snowville Waterworks	15.7	55.4	28.6	33.8	0.0	133.5	3.0	45.3	91.2	15.4	22.4	6.6	0.0	44.4	***44.4***	0.0	42.2	30.4	72.6	136.5	63.9
Total Community Systems	38.5	82.9	28.7	38.3	35.8	224.2	27.9	104.9	147.2	37.7	22.5	7.5	0.0	67.7	67.7	0.0	64.4	49.1	113.4	252.1	138.7
Non-community Systems	0.2	0.2	0.0	31.4	0.0	31.8	12.9	6.4	38.3	0.2	0.0	6.2	0.0	6.3	***6.3***	0.0	6.0	12.8	18.7	44.7	26.0
Self Supplied Industries	24.8	6.2	0.0	0.0	0.0	31.1	403.7	428.5	6.2	24.3	0.0	0.0	0.0	24.3	***24.3***	0.0	23.1	2.1	25.2	434.7	409.5
Private Domestic Systems	34.1	51.2	0.0	0.0	0.0	85.3	0.0	34.1	51.2	33.4	0.0	0.0	0.0	33.4	***33.4***	0.0	31.8	17.1	48.8	85.3	36.5
COUNTY TOTALS	**97.6**	**140.5**	**28.7**	**69.7**	**35.8**	**372.4**	**444.5**	**574.0**	**242.8**	**95.7**	**22.5**	**13.7**	**0.0**	**131.8**	**131.8**	**0.0**	**125.2**	**80.9**	**206.2**	**816.8**	**610.6**
JUAB COUNTY																					
Goshute Indian Reservation	11.7	4.4	0.0	0.2	0.0	16.3	0.0	11.7	4.6	11.5	0.0	0.0	0.0	11.5	***11.5***	0.0	10.9	1.5	12.4	16.3	3.9
Total Community Systems	11.7	4.4	0.0	0.2	0.0	16.3	0.0	11.7	4.6	11.5	0.0	0.0	0.0	11.5	11.5	0.0	10.9	1.5	12.4	16.3	3.9
Non-community Systems	0.0	0.0	0.0	0.9	0.0	0.9	12.0	0.2	12.7	0.0	0.0	0.2	0.0	0.2	***0.2***	0.0	0.2	4.2	4.4	12.9	8.5
Self Supplied Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0
Private Domestic Systems	5.6	8.4	0.0	0.0	0.0	14.0	0.0	5.6	8.4	5.5	0.0	0.0	0.0	5.5	***5.5***	0.0	5.2	2.8	8.0	14.0	6.0
COUNTY TOTALS	**17.3**	**12.8**	**0.0**	**1.1**	**0.0**	**31.2**	**12.0**	**17.5**	**25.7**	**17.0**	**0.0**	**0.2**	**0.0**	**17.2**	**17.2**	**0.0**	**16.3**	**8.6**	**24.9**	**43.2**	**18.3**
MILLARD COUNTY																					
Shiloah Wells Water Co.	4.0	10.0	0.3	7.4	0.0	21.7	0.0	5.7	16.0	3.9	0.2	1.5	0.0	5.6	**5.6**	2.6	2.9	5.3	8.2	21.7	13.5
Total Community Systems	4.0	10.0	0.3	7.4	0.0	21.7	0.0	5.7	16.0	3.9	0.2	1.5	0.0	5.6	5.6	2.6	2.9	5.3	8.2	21.7	13.5
Non-community Systems	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0
Self Supplied Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	***0.0***	0.0	0.0	0.0	0.0	0.0	0.0
Private Domestic Systems	11.2	16.8	0.0	0.0	0.0	28.0	0.0	11.2	16.8	11.0	0.0	0.0	0.0	11.0	***11.0***	0.0	10.4	5.6	16.0	28.0	12.0
COUNTY TOTALS	**15.2**	**26.8**	**0.3**	**7.4**	**0.0**	**49.7**	**0.0**	**16.9**	**32.8**	**14.9**	**0.2**	**1.5**	**0.0**	**16.6**	**16.6**	**2.6**	**13.3**	**10.9**	**24.2**	**49.7**	**25.5**
TOOELE COUNTY																					
Dugway - English Village	141.1	124.8	0.0	239.7	178.8	684.4	680.5	367.8	997.1	138.3	0.0	47.0	0.0	185.3	**185.3**	36.4	145.2	332.4	477.5	1364.9	887.4
Erda Acres Water Company	20.4	66.2	0.0	0.3	3.2	90.1	0.0	23.7	66.4	20.0	0.0	0.1	0.0	20.1	***20.1***	0.0	19.0	22.1	41.2	90.1	48.9
Golden Garden Water System	6.8	18.8	0.0	0.0	1.5	27.1	0.0	8.3	18.8	6.7	0.0	0.0	0.0	6.7	***6.7***	0.0	6.3	6.3	12.6	27.1	14.5
Grantsville Municipal Water System	564.6	115.4	206.6	86.2	58.2	1031.0	821.8	805.3	1047.5	553.3	162.0	16.9	0.0	732.2	**732.2**	22.7	694.8	349.2	1044.0	1852.8	808.8
Lincoln Culinary Water	47.1	19.3	0.0	7.5	0.8	74.7	1.7	49.4	27.0	46.2	0.0	1.5	0.0	47.6	***47.6***	0.0	45.2	9.0	54.2	76.4	22.2
Ophir Canyon Water Association	2.5	2.0	0.0	9.9	0.0	14.4	0.0	4.5	9.9	2.5	0.0	1.9	0.0	4.4	***4.4***	0.0	4.2	3.3	7.5	14.4	6.9
S & W Trailer Park	4.7	1.1	0.3	0.0	0.2	6.3	0.0	5.1	1.2	4.6	0.2	0.0	0.0	4.8	**4.8**	7.9	0.0	0.4	0.4	6.3	5.9
Silver Spur Ranchos	10.2	37.0	0.0	0.1	0.4	47.7	0.0	10.6	37.1	10.0	0.0	0.0	0.0	10.0	**10.0**	0.0	9.5	12.4	21.9	47.7	25.8
Stansbury Improvement District	485.4	533.1	34.9	548.4	6.1	1607.9	0.0	629.1	978.8	475.7	27.4	107.5	0.0	610.5	**610.5**	194.9	403.4	326.3	729.7	1607.9	878.2
Stockton Municipal Water System	51.0	230.7	2.0	4.9	0.3	288.9	9.0	53.9	244.0	50.0	1.6	1.0	0.0	52.5	**52.5**	0.0	49.9	81.3	131.2	297.9	166.7
Tooele Army Depot	35.3	0.0	0.0	543.7	27.6	606.6	0.0	171.6	435.0	34.6	0.0	106.6	0.0	141.2	**141.2**	11.1	127.2	145.0	272.2	606.6	334.4
Tooele Municipal Water System	2,352.3	1,881.8	369.6	940.9	201.6	5746.2	1365.9	3037.8	4074.3	2305.3	289.8	184.4	0.0	2779.4	**2779.4**	210.6	715.9	1358.1	2074.0	7112.1	5038.1
Vernon Culinary Water Co.	15.7	27.5	1.4	1.7	1.4	47.7	18.4	18.6	47.5	15.4	1.1	0.3	0.0	16.8	**16.8**	0.0	16.0	15.8	31.8	66.1	34.3
Wendover Municipal Water System	92.8	30.0	130.3	44.0	15.3	312.4	0.0	221.1	91.3	90.9	102.2	8.6	0.0	201.7	**21.1**	42.7	155.0	30.4	185.4	312.4	127.0
Total Community Systems	3,829.9	3,087.7	745.1	2,427.3	495.4	10,585.4	2,897.3	5,406.8	8,075.9	3,753.3	584.2	475.8	0.0	4,813.2	4,632.6	526.3	2,391.7	2,692.0	5,083.6	13,482.7	8,399.1
Non-community Systems	1.5	2.3	309.4	279.5	0.2	592.9	0.0	305.1	287.8	1.5	242.6	54.8	0.0	298.8	***298.8***	0.0	283.9	95.9	379.8	592.9	213.1
Self Supplied Industries	911.6	227.9	0.0	0.0	1.5	1,141.0	36.7	949.8	227.9	893.4	0.0	0.0	0.0	893.4	***893.4***	0.0	848.7	76.0	924.7	1,177.7	253.0
Private Domestic Systems	125.5	188.3	0.0	0.0	0.0	313.8	0.0	125.5	188.3	123.0	0.0	0.0	0.0	123.0	***123.0***	0.0	116.9	62.8	179.6	313.8	134.2
COUNTY TOTALS	**4,868.6**	**3,506.2**	**1,054.5**	**2,706.8**	**497.1**	**12,633.1**	**2,934.0**	**6,787.3**	**8,779.8**	**4,771.2**	**826.7**	**530.5**	**0.0**	**6,128.4**	**5,947.8**	**526.3**	**3,641.2**	**2,926.6**	**6,567.8**	**15,567.1**	**8,999.3**
Basin Community Systems	**3,884.1**	**3,185.0**	**774.1**	**2,473.2**	**531.2**	**10,847.6**	**2,925.2**	**5,529.2**	**8,243.6**	**3,806.4**	**606.9**	**484.7**	**0.0**	**4,898.1**	**4,717.4**	**528.9**	**2,469.9**	**2,747.9**	**5,217.7**	**13,772.8**	**8,555.1**
Total Non-Community Systems	**1.7**	**2.5**	**309.4**	**311.8**	**0.2**	**625.6**	**24.9**	**311.8**	**338.7**	**1.6**	**242.6**	**61.1**	**0.0**	**305.3**	**305.3**	**0.0**	**290.1**	**112.9**	**403.0**	**650.5**	**247.5**
Self-Supplied Industries	**936.5**	**234.1**	**0.0**	**0.0**	**1.5**	**1,172.0**	**440.4**	**1,378.3**	**234.1**	**917.7**	**0.0**	**0.0**	**0.0**	**917.7**	**917.7**	**0.0**	**871.8**	**78.0**	**949.9**	**1,612.4**	**662.5**
Private Domestic Systems	**176.8**	**265.3**	**0.0**	**0.0**	**0.0**	**442.1**	**0.0**	**176.8**	**265.3**	**173.3**	**0.0**	**0.0**	**0.0**	**173.3**	**173.3**	**0.0**	**164.6**	**88.4**	**253.1**	**442.1**	**189.0**
WEST DESERT BASIN TOTALS	**4,999.1**	**3,686.9**	**1,083.5**	**2,785.0**	**532.9**	**13,087.3**	**3,390.5**	**7,396.1**	**9,081.7**	**4,899.1**	**849.5**	**545.9**	**0.0**	**6,294.4**	**6,113.8**	**528.9**	**3,796.4**	**3,027.2**	**6,823.6**	**16,477.8**	**9,654.1**

Color Code:
- Potable Use Data
- Secondary Use Data
- Indoor/Outdoor Use Data
- Return Flow Data
- Delivery Data
- Depletion Data

Treatment Facility Key:
- Regular = Sewage Treatment Plant
- **Bold = Faculative ponds/Lagoons**
- ***Bold/Italics = Septic System/Tanks***