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Drinking Water

Constant vigilance is required to assure high quality drinking water will always be available for a growing population.

11.1 Introduction

This section discusses public and private water supplies in the basin and reviews their present status. A public water system, as defined by the Utah Division of Drinking Water, is one serving at least 15 connections or 25 people 60 days per year. Water from public systems may be used for culinary, lawn and garden, car washing, and many other uses. Industrial firms use water from public water systems also, but Section 18 deals specifically with this use.

11.2 Setting

In 1995, people and their activities in the Utah Lake Basin used 190 gallons of residential culinary water per day. The statewide average for all public supplied culinary use is estimated to be 270 gallons per capita day (gpd). Use in cities and towns varied between 110 gpd in Bradford Acres Water Association in Utah County and Timber Lakes Subdivision in Wasatch County to 448 gpd in Goshen. Most of the variability between communities can be attributed to the amount of culinary water used for outside lawn and garden irrigation, leaking pipelines and high water-using industries.

11.3 Organizations and Regulations

All public drinking water supplies are subject to the Utah Safe Drinking Water Act and Utah Public Drinking Water Regulations. The Utah Department of Environmental Quality, Division of Drinking Water, administers the laws and regulations. In addition, the Division of Water Rights and the Board of Health have responsibility for controlling how drinking water wells are constructed.

11.3.1 Local

Towns, cities, and counties all have primary responsibilities for drinking water quality control within their respective jurisdictions. In administering state drinking water regulations, drinking water facilities are categorized as community water systems, non-transient and non-community systems. Of the 140 public drinking water systems in the basin, 128 are approved, 10 are unapproved and two need corrective action as shown in Table 11-1. Community water systems are treatment and/or distribution facilities serving a minimum of 15 connections used by year-around residents. Non-community systems provide seasonal water service and are usually owned and operated by small public organizations. Non-community systems provide commercial and industrial drinking water.

All public water systems have their own drinking water sources. Many receive additional water from districts such as the Central Utah Water Conservancy District. In the cases of Orem and Provo, metropolitan water districts subscribe for water from the CUWCD treatment plant.

11.3.2 State

Verification that a public water system is meeting state and federal standards is made through monitoring programs established by state and federal regulations. The Rules for Public Drinking Water Systems (RPDWS) outline the procedures local plant operators must follow when taking water samples. The rules also outline the documentation requirements of subsequent water quality analyses for submission to the Division of Drinking Water.

In an extreme emergency where danger to public health is imminent, the scope and nature of the threat must be reported to the Utah Division of Drinking Water. Upon receiving a report of a significant decline in the quality of a public water supply, the division will take immediate action to eliminate the initial and ongoing cause of the problem. System operating policies are then revised to prevent similar problems from occurring in the future.

Table 11-1 PUBLIC DRINKING WATER SYSTEM RATINGS				
Rating	Juab	Utah	Wasatch	Total
Approved	11	74	43	128
Not Approved	0	3	7	10
Corrective Action	0	1	1	2
Total	11	78	51	140

The RPDWS outline the state's responsibility to administer programs designed to monitor existing drinking water quality by testing and analyzing water samples. They also set minimum contaminant levels and provide a source of funding for the design, construction, and operation of drinking water treatment and distribution facilities.

The Utah Safe Drinking Water Act (USDWA) created the Utah Safe Drinking Water Board with the power to regulate and protect the quality of Utah's drinking water. The USDWA includes regulations designed to: 1) Establish standards for drinking water quality, 2) establish standards and regulations for the design and construction of new and expanded water treatment and conveyance facilities, 3) protect watersheds and other sources of raw public water supplies, 4) provide technical and financial assistance to train operators, construct new treatment and distribution facilities and renovate existing ones, 5) administer federal programs that provide technical and financial assistance to local water agencies, 6) carry out emergency plans when natural disasters contaminate public drinking water supplies; and 7) provide enforcement of state and federal drinking water regulations.

State safe drinking water regulations reflect the same standards as federal regulations. State regulations can be more stringent than federal regulations where the Board and Division of Drinking Water feel federal regulations do not adequately protect the health of people in a certain area.

Maximum contaminant levels (MCLs) have been established by the Utah Division of Drinking Water in setting treatment standards. MCLs have been established for primary and secondary standards and treatment processes. Primary standards apply to treatment requirements to protect public health and safety, while secondary standards apply to the maintenance of water aesthetics such as taste, odor and turbidity. Primary standards must be followed by all public drinking water systems. Secondary standards, however, are only recommended for compliance and clientele satisfaction.

The Division of Drinking Water also administers and promotes other programs. Construction funding is provided from a state revolving fund. This fund is used to construct new treatment and distribution facilities or repair existing facilities. Construction funds are awarded in four ways: low interest loans, direct grants, interest buy-downs and credit enhancements.

The *Drinking Water Source Protection Plan* is to be submitted by system owners to the Division of Drinking Water for general review and assessment of compliance with RPDWS. However, an exception may be granted to an operator of a public water system in the event the operator cannot afford the costs associated with the preparation of such a plan.

11.3.3 Federal

With passage of the federal Safe Drinking Water Act (SDWA) in 1974, the federal government established national drinking water regulations to protect the public health from water borne diseases. Congress expanded and strengthened the SDWA in 1986. The amended SDWA significantly increased the responsibility of the Environmental Protection Agency (EPA) to: 1) Establish maximum levels of contamination for established pollutants, 2) set deadlines for owners/operators of treatment facilities to comply with federal regulations, 3) regulate lead and copper source protection, and 4) strengthen enforcement of all regulations in the act.

Chemical, physical, radiological and bacteriological substances in drinking waters that pose a health risk to the public are regulated by the EPA under provisions given in the SDWA. The EPA has established MCLs for drinking water. An extensive list of MCLs has been established for the most common organic and inorganic contaminants. In addition, the SDWA established a strict schedule for the EPA to set MCLs for additional contaminants. As a result, additional contaminants are regularly identified and subjected to new regulations.

To control the aesthetic quality of drinking water supplies, the SDWA has also established a list of secondary maximum contamination levels (SMCLs).

The SMCLs were established to improve taste, odor and color.

The SDWA also requires state and local water providers to monitor a specified list of both regulated and unregulated contaminants. Selection of contaminants is dependant on the number of people served, the water supply source and contaminants likely to be found. The standardized monitoring framework is administered over three, three-year compliance cycles for a nine-year total monitoring period beginning in 1992. Completion of the first nine-year monitoring period will be followed by a second nine-year period.

The 1986 SDWA amendments require all states to develop wellhead protection programs. The Division of Drinking Water has created the Drinking Water Source Protection Rule (DWSPR) outlining the general requirements to protect wellheads from outside surface contamination. Requirements of the DWSPR include preparing a *Drinking Water Source Protection Plan* for each groundwater source in all public water systems. Proof of ownership and maintenance of all land in and around wellheads where surface water contamination can occur is also required.

The 1996 amendments to the Safe Drinking Water Act created several new programs and included a total authorization of more than $12 billion in federal funds for various drinking water programs and activities nationwide from 1997 through 2003.

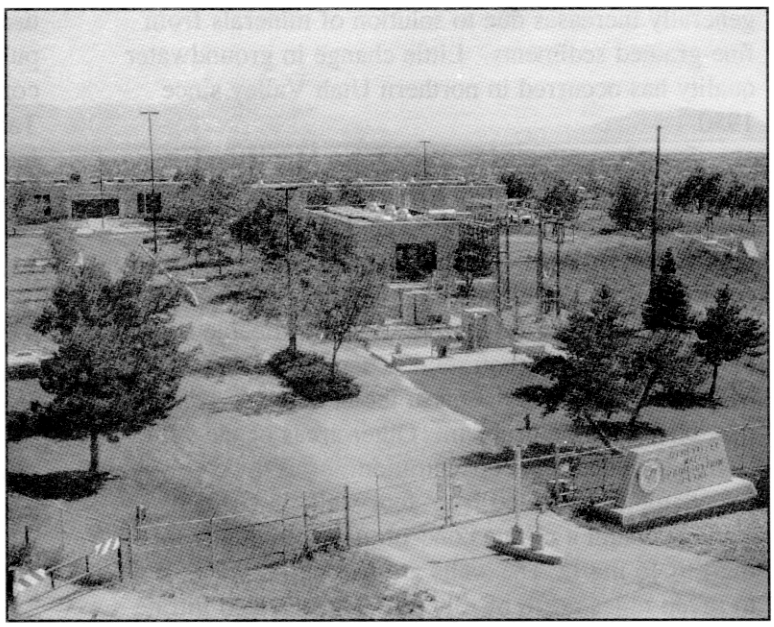
New capacity development provisions are added to the SDWA. The EPA must complete a review of existing state capacity development efforts and publish information to assist the states and public water suppliers with these efforts.

By August 6, 1998, The EPA must publish regulations requiring community water systems to prepare and distribute consumer confidence reports at least once a year. The governor of a state may decide not to apply the direct mailing requirement for consumer confidence reports to a community water system serving fewer than 10,000 people.

The EPA must publish a maximum contaminant level goal and promulgate a National Primary Drinking Water Regulation for contaminants that: (1) may have an adverse effect on human health, (2) are known or are likely to occur in public water systems at a frequency and concentration of significance to public health, and (3) offers a meaningful opportunity to reduce health risk for people served by public water systems.

The EPA must issue regulations establishing criteria for a monitoring program for unregulated contaminants. The regulations are to ensure that only a representative sample of systems serving 10,000 or fewer people are required to monitor. By August 6, 1999, and every five years thereafter, the EPA must issue a list of no more than 30 unregulated contaminants to be monitored by public water systems and included in the occurrence database.

A new program is established authorizing the EPA to provide grants to states for the development and implementation of a state program to ensure the coordinated and comprehensive protection of groundwater resources within the state.



Utah Valley Water Purification Plant

11.4 Drinking Water Problems

Demand for high quality water and the potential for contamination of drinking water supplies has increased along with population growth. Natural geologic conditions, as well as human activities like landfill operation, agriculture, mining, construction and hazardous waste spills, all contribute to drinking water problems. Contamination also comes from watershed and alluvial fan recharge areas where pollutants enter the aquifers.

11.4.1 Operation of Facilities

Water quality in the upper reaches of the basin is considered good to excellent. Occasional repair,

replacement, enlargement, or upgrading of each system is required to maintain adequate levels of service. Investments in wells, storage tanks and pipelines can be expected.

11.4.2 Groundwater Contamination

Most groundwater is acceptable for use in municipal, industrial, and agricultural operations with some restrictions because of isolated areas of poorer quality.

In northern Utah Valley, Total Dissolved Solids (TDS) concentrations are generally between 100 and 1,000 mg/l, with most wells containing between 150 and 500 mg/l. The smallest concentrations are found near Alpine and Lehi, and the largest are found near Saratoga Springs. As deeper water moves upward, the TDS generally increases due to solution of minerals from fine-grained sediments. Little change in groundwater quality has occurred in northern Utah Valley since 1950.

Samples collected in 1989 from Mapleton City municipal wells contained 5 mg/l of nitrate. A possible source of the nitrate is a nitric acid spill that occurred up-gradient in 1986. Private testing shows the concentrations are highest near the spill with some samples containing 50 mg/l. Another probable source of nitrate is the concentration of septic tanks in Mapleton. The installation of the new sewer system may eliminate the problem. Other areas of the valley have a lower nitrate concentration.

Samples collected from four wells in Goshen Valley contain a nitrate concentration ranging from 9 mg/l to 46 mg/l. The wells are from three miles south to seven miles north of Elberta. The elevated nitrate concentrations are in a north-south line, with the highest concentration occurring near Elberta. The source of the nitrate has not been determined.

11.5 Culinary Water Use and Projected Demands

Population projections for all communities in the basin are presented in Section 4. These projections are used to forecast municipal and industrial water needs. Most public water suppliers expect an increased demand throughout the projection period to the year 2020. Culinary water use and projected demand are shown in Table 9-3.

The effects of water conservation are expected to reduce projected water use by about 13 percent (24,000 acre-feet) by the year 2020. Water conservation is discussed in Section 17.

11.5.1 Water Treatment

All surface water delivered for culinary use is treated. Well water requires no treatment in most cases. Spring water is usually chlorinated. Table 11-2 lists the only two treatment plants in this basin and their current capacities and treatment method.

11.5.2 Water Supply and Use

Culinary water treatment and distribution systems provide drinking water to about 318,000 people (1994). The balance of the population is served by small or single family domestic systems. Table 11-3 shows the water suppliers, population served, total connections, sources, treatment types, the present use and per capita use rates. Water use and projected demands on major public drinking water systems, including most commercial and some industrial uses, are shown in Table 11-4. Total culinary water use is expected to increase from 141,345 acre-feet in 1995 (see Table 5-4) to 212,440 acre-feet by the year 2020 (see Table 9-6).

11.6 Issues and Recommendations

Drinking water issues revolve around water quality and the contamination of streams, reservoirs and groundwater aquifers by waste effluent and poor land use practices. These issues are discussed in other sections of the *State Water Plan*. Section 12 deals with water quality in streams and reservoirs, and Section 19 addresses groundwater issues. ✣ ✣

Table 11-2
WATER TREATMENT FACILITIES

Plant Name	Owner	Treatment Method	Current Capacity (Mgd)
Utah Valley Water Purification	Central Utah Water Cons. Dist.	direct filtration	42.00
Camp Cloud Rim	Utah Girl Scouts	conventional	.03
	Total Capacity		42.03

Table 11-3
PUBLIC COMMUNITY SYSTEMS CULINARY WATER SUPPLY AND USE-1995

Water Supplier	Pop. Served	Total Connections	Source	Treatment Type	M&I Water Use (acre-feet)	Per Capita Use (gpcd)
JUAB COUNTY						
Eureka [a]	562	292	Wells	None	79	119
Mona	800	215	Springs	Chlorination	227	241
Nephi	3,800	1,436	Springs/Well	Chlorination	1,209	270
SUMMIT COUNTY						
Francis Town System	530	222	Spring/Wells	Chlorination	271	434
Woodland Mutual Water Co.	196	68	Spring/Well	Chlorination	82	355
UTAH COUNTY						
Alpine	4,694	1,019	Springs/Wells	Chlorination	1,469	279
Alpine Cove Subdivision	80	24	Wells	None	27	303
American Fork City	18,754	4,675	Springs/Wells	Chlorination	4,460	212
Bradford Acres Water Assn.	50	10	Well	None	6	110
Cedar Fort	360	126	Springs	Chlorination	112	278
Covered Bridge Canyon	215	57	Well	None	63	261
Elberta	250	47	Wells	None	121	433
Elk Ridge and Woodland	1,474	251	Wells	None	360	218
Genola	800	200	Well/Wholesale	None	370	413
Goosenest Water Co.	110	22	Spring/Well	None	36	288
Goshen	635	265	Spring	None	319	448
Highland	6,633	1,258	Wells	None	1,965	264
Lehi	9,786	2,750	Springs/Wells	Chlorination	2,369	216
Lindon	4,594	950	Spring/Well	Chlorination	1,120	218
Manila Culinary Water	3,752	460	Springs/Well	None	731	174
Mapleton	4,095	1,150	Springs/Wells	Chlorination	1,270	277
North Fork Special Service Dist.	413	230	Springs	Chlorination	106	229
Orem	87,925	17,200	Springs/Wells/Wholesale	Chlorination	26,797	272
Payson	11,480	2,850	Springs/Wells	Chlorination	4,295	334
Pleasant Grove	14,054	3,500	Springs/Wells	Chlorination	3,865	246
Provo	93,567	15,000	Springs/Wells	Chlorination	29,861	285
Salem	2,823	866	Springs/Wells	Chlorination	702	222
Santaquin	2,841	800	Spring/Wells	Chlorination	805	255
Spanish Fork	12,705	4,092	Springs/Wells	Chlorination	4,343	305
Springdell	62	26	Springs	Chlorination	14	207
Springville	15,792	4,045	Springs/Wells	Chlorination	5,309	300
Spring Lake Water Works	133	128	Springs/Wells	Chlorination	26	175
Utah State Hospital	567	25	Springs/Wells	None	95	150
Vineyard (b)	182		Well		18,374	NA
Vivian Park Homeowners	68	67	Spring/Well	Chlorination	19	277
White Hills Subdivision	60	17	Well	None	24	363

Table 11-3 - - - - Continued

PUBLIC COMMUNITY SYSTEMS CULINARY WATER SUPPLY AND USE (1995)

Water Supplier	Pop. Served	Total Connections	Source	Treatment Type	M&I Water Use (acre-feet)	Per Capita Use (gpcd)
Woodland Hills	790	127	Wells	None	250	282
WASATCH COUNTY						
Center Creek Water System	330	67	Springs	Chlorination	86	222
Charleston Water Cons. Dist.	552	176	Springs/Well	None	186	285
Country Estates Mobile Homes	180	52	Wells	None	24	112
Daniel Domestic Water Co.	500	105	Springs	Chlorination	75	126
Daniel-Bethers Water Co.	58	21	Spring	None	7	115
Heber City Water System	6,000	1,500	Springs/Wells	Chlorination	1,330	188
Interlaken Mutual Water Co.	240	106	Wells	None	32	112
Midway City Water System	1,730	678	Spring	None	754	371
Storm Haven	125	38	Well	None	21	142
Timber Lakes Subdivision	157	133	Springs	None	20	110
Wallsburg Town Water System	275	102	Spring	Chlorination	114	353

Notes: [a] Eureka is outside the Utah Lake Basin but receives it's water from Santaquin.
[b] Vineyard includes industrial water use by Geneva Steel, Inc.

Table 11-4
CURRENT AND PROJECTED CULINARY WATER DIVERSIONS
FOR MAJOR PUBLIC WATER SYSTEMS

Water Supplier	1995	2020
	(acre-feet)	
Juab County		
Mona	230	250
Nephi City	1,210	1,640
Summit County		
Francis	270	390
Utah County		
Alpine	1,470	2,700
American Fork	4,460	6,630
Elk Ridge	360	750
Highland	1,970	3,530
Lehi	2,370	3,580
Lindon	1,120	1,890
Mapleton	1,270	1,960
Orem	26,800	47,700
Payson	4,300	6,470
Pleasant Grove	3,870	6,430
Provo	29,870	42,500
Salem	700	1,100
Santaquin	810	1,210
Spanish Fork	4,340	6,160
Springville	5,310	7,450
Wasatch County		
Charleston	190	190
Heber	1,130	1,580
Midway	750	1,220
Wallsburg	110	140