

1992

# White City Water Company and Sandy City v. Public Service Commission of Utah: Reply Brief

Utah Supreme Court

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IN THE SUPREME COURT OF THE STATE OF UTAH

Appellants-Petitioners,

vs.

PUBLIC SERVICE COMMISSION  
OF UTAH,

Appellee-Respondent.

Case No. 920220

Priority No. 10

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**FILED**

APR 9 1993

CLERK SUPREME COURT  
UTAH

Tab A

- BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH -  
-----

In the Matter of the Application )  
of WHITE CITY WATER COMPANY for )  
Approval of a Contract for the )  
Sale and Purchase of all of its )  
Outstanding Stock to and by Sandy )  
City and the Municipal Building )  
Authority. )

DOCKET NO. 91-018-01

SCHEDULING ORDER

-----  
ISSUED: January 27, 1993

BY THE COMMISSION:

On December 15, 1992, the Commission heard the Motion for Scheduling Conference of White City Water Company and Sandy City. After hearing argument from the parties, the Commission granted the Motion for Scheduling Conference and requested that the parties meet informally and agree upon specific dates for the various filings to be made in this matter. Specifically, as the first step in the process, the Commission directed that Sandy City file by January 15, 1993, a statement of the conditions or jurisdictional oversight which it would accept, if the Commission were to approve the sale of White City Water Company (its outstanding stock) to Sandy City and the Municipal Building Authority.

Sandy City has now filed a statement which gives the Commission no understanding of the willingness of Sandy City to resolve the concerns of the potential non-resident water users and indicates that it will not waive the contractual condition that the Commission forswear any jurisdiction following the sale. In its filing Sandy City states it is necessary to proceed through the entire public interest portion of this Docket in order for it to determine what might be done for non-resident users.



This Commission earlier made clear its position that it would have jurisdiction following this sale inasmuch as Sandy City would be in the general business of providing utility services beyond its municipal boundaries and that there was no point in holding a hearing on public interest if Sandy City would require a waiver of jurisdiction.

In the interest of settling this matter fairly, the Commission is willing to consider alternatives to full jurisdiction that would protect the interests of retail water customers outside municipal boundaries and still allow the sale of White City to proceed. Unfortunately, Sandy City's filing does not advance this consideration.

Therefore, we direct that on or before February 5, 1993, White City Water Company and Sandy City file testimony, exhibits and work papers, including any cost-of-service studies, supporting their position that the sale would benefit the public interest and a clear explanation of why it cannot afford us any intelligence on resolving the non-residents' concerns without going through the public interest portion of the hearing.

The Division of Public Utilities (Division) shall file an analysis of the reasonableness of the White City and Sandy City filings on or before March 15, 1993.

We will convene at the Commission on March 23, 1993, at 10:00 a.m., a settlement conference to explore the logic of proceeding any further with the matter.

DATED at Salt Lake City, Utah, this 27th day of  
January, 1993.

/s/ Stephen F. Mecham, Chairman

/s/ James M. Byrne, Commissioner

(SEAL)

/s/ Stephen C. Hewlett, Commissioner

Attest:

/s/ Julie Orchard  
Commission Secretary

Tab B

TESTIMONY OF DARREL M. SCOW

1 Q. Please state your name and address for the record.

2 A. My name is Darrel Scow. My business address is 8775 South 700  
3 West, Sandy City, Utah 84070.

4 Q. By whom and in what position are you currently employed?

5 A. I am currently the Director of Public Works for Sandy City.  
6 I have held that position for 6 1/2 years.

7 Q. Please state your educational experience.

8 A. I graduated with a degree in Trade and Industrial Engineering  
9 from Utah State University in 1969. Since that time, I have  
10 attended numerous seminars and workshops concerning the  
11 operation of public water systems, among other things.

12 Q. Please describe your duties as Director of the Public Works  
13 Department of Sandy City.

14 A. I have responsibility for all aspects of the Public Works  
15 Department of Sandy City which includes water, roads, snow  
16 removal, refuse collection, flood control, traffic,  
17 transportation, engineering, irrigation and landfill. The  
18 largest part of my responsibilities relates to the Sandy City  
19 Water Department. At present, Sandy City has 21,304  
20 residential customers, 589 commercial customers, and 136  
21 customers listed as "other", for a total of 22,029 customers.

1 Q. Will you describe for the Commission the physical layout of  
2 the Sandy City Water system?

3 A. Attached as Exhibits 1 is a map of Sandy City, its water  
4 system and nearby water systems. The map also indicates the  
5 location of the White City Water Company system and its  
6 proximity to the Sandy City system. As is apparent from the  
7 map, approximately one half of the White City Water system is  
8 located within the municipal boundaries of Sandy City and the  
9 other one-half is located outside of the Sandy City municipal  
10 limits.

11 Q. Have you been involved in the negotiation of the Agreement to  
12 purchase the shares of the White City Water Company by Sandy  
13 City and the Sandy City Municipal Building Authority?

14 A. Yes, as Director of Public Works, I have been intimately  
15 involved in the evaluation of the purchase of the White City  
16 Water Company. In that regard, I have worked closely under  
17 the direction of Mayor Smith, who will also be filing prefiled  
18 testimony in this matter. The purchase of the system has also  
19 been reviewed and approved by the Sandy City Council.

1 Q. Why is Sandy City interested in acquiring the White City Water  
2 Company?

3 A. Sandy City began looking at the acquisition of the White City  
4 Water Company out of concern for the water service to its  
5 residents within the service territory of the White City Water  
6 Company. Though Sandy City believes that the White City Water  
7 Company has traditionally been well run for a small, under-  
8 capitalized water company, Sandy City had concerns about the  
9 state of the White City Water Company system. Those concerns  
10 relate both to the long-term adequacy of that system to supply  
11 its Sandy City citizens, as well as the need for system  
12 improvements which have been testified to by Mr. McFarland and  
13 by the witness of White City Water Company. In addition,  
14 Sandy City feels that integration of the White City Water  
15 Company will in the long-term benefit all ratepayers of the  
16 White City Water Company. This is due to certain delivery  
17 efficiencies which could be realized given the close proximity  
18 of that system to the system of Sandy City. There is also the  
19 potential that a number of capital improvements would have to  
20 be duplicated if both Sandy City and White City continued to  
21 run their systems entirely separate.

22 Q. Have you had an opportunity to review the filings of the White  
23 City Water Company in this matter?

24 A. Yes.

1 Q. Have those filings confirmed some of the concerns of Sandy  
2 City with respect to the White City Water Company?

3 A. Yes. As indicated, the engineering studies of the White City  
4 Water Company confirm the findings of Mr. McFarland with  
5 respect to a number of essential capital improvements to the  
6 White City Water Company system. In addition, the filings of  
7 the White City Water Company indicate the necessity for a  
8 substantial rate increase which will directly impact the Sandy  
9 City residents served by the White City Water Company in order  
10 that necessary capital improvements can be made. Finally, of  
11 perhaps even greater concern are the safety issues raised in  
12 both engineering studies. It is Sandy City's concern that,  
13 absent Sandy City acquiring the system, the White City Water  
14 Company may simply not have the ability to raise the capital  
15 to make the necessary improvements. Furthermore, though a  
16 rate increase is not the first choice of any party, of even  
17 greater concern is that a rate increase will not be obtained,  
18 because the capital necessary to make the improvements is not  
19 available, leaving the substantial safety concerns unresolved,  
20 as well as allowing the current White City water system to  
21 deteriorate further. Sandy City has the financial capability  
22 and commitment to finance thxese improvements. Sandy City's  
23 capability and commitment is well evidenced by its history of  
24 improvements to its water storage and delivery system over the  
25 past decade. During that time, Sandy City has invested over  
26 \$33 million in its water system.

1 Q. Could you discuss Sandy City's long-term planning for its  
2 water system?

3 A. Sandy City will continue to plan for the long-term, in order  
4 to accommodate the growth of Sandy City. As is indicated in  
5 the testimony of Mayor Smith, Sandy City has been one of the  
6 fastest growing communities in the state of Utah and is  
7 currently the third-largest city in the state. All  
8 expectations are that growth will continue through the next  
9 decade and beyond. In order for Sandy City to plan for its  
10 long-term growth, it believes that control and efficient  
11 integration of the White City Water system is essential. This  
12 does not mean, however, that Sandy City has any plans to annex  
13 the unincorporated areas served by the White City Water  
14 Company. To the contrary, Sandy City considers annexation a  
15 choice to be made by the citizens of that unincorporated area.  
16 Regardless of their ultimate choice, however, Sandy City must  
17 be able to plan for the efficient and safe supply of water to  
18 Sandy City residents. Control of the White City Water Company  
19 is essential if that goal is to be achieved.

20 A. Could you describe the current rates charged customers of the  
21 Sandy City water system?

22 Q. Yes. Attached as Exhibit 2 to my testimony is a copy of the  
23 current rate schedule of the Sandy City Water Department. As  
24 you will note, Sandy City has a number of rates for various  
25 areas served by its water system. The rate for Sandy City



1 residents is uniform for all residents. There are, however,  
2 several rates applicable to customers located out of the Sandy  
3 City municipal boundaries in the unincorporated area of Salt  
4 Lake County. Two of these rates, the Granite Water Company  
5 rate and the Union Jordan rate, are the result of specific  
6 agreements reached with the then-current owners of two small  
7 water systems which were acquired by Sandy City a number of  
8 years ago. Beyond that, the rates charged other customers in  
9 the unincorporated area, who are currently served water which  
10 is surplus to the current needs of Sandy City is higher than  
11 the rate charged Sandy City citizens.

12 Q. Have you had any studies prepared to substantiate the rate  
13 currently charged in the unincorporated area of the county who  
14 are not covered by one of the special, historical rates.

15 A. Yes. Dr. Robert Siegel, of Eckhoff, Watson & Preator,  
16 recently completed a water utility rate study, a summary of  
17 which is attached as Exhibit 3 to my testimony. Dr. Siegel's  
18 study confirmed that the rate difference for customers in the  
19 unincorporated area is warranted by the costs attributable to  
20 service.

21 Q. Does that study have any direct applicability to the rate at  
22 which customers of the White City Water Company in the  
23 unincorporated area will be charged if Sandy City acquires the  
24 subject system?

25 A. No, the study does not have direct applicability. However, as

1       you will see from the filings of the White City Water Company,  
2       the rate which those individuals will be charged is justified  
3       under traditional utility analysis. Specifically, if this  
4       sale is approved, Sandy City will proceed to make the  
5       improvements described in the testimony of Mr. McFarland and  
6       the testimony filed by the White City Water Company. Those  
7       improvements would, if the utility remains separate, justify  
8       a rate above that which non-Sandy City resident customers are  
9       charged by Sandy City. In other words, the rate which those  
10      customers will be charged by Sandy City will be no higher than  
11      the rate the White City Water Company will be compelled to  
12      charge if essential capital improvements are made.

13     Q.   Please describe the manner in which rates are generally set by  
14           Sandy City.

15     A.   The initial responsibility with respect to rates is within my  
16           general responsibility as the Director of the Department of  
17           Public Works. On a regular basis we analyze the cost of  
18           serving customers, capital improvements necessary and the  
19           revenues necessary to assure the long-term adequacy of the  
20           Sandy City water system. From time to time, we will call on  
21           individuals such as Dr. Siegel with Eckhoff, Watson, & Preator  
22           to assist us with that analysis. If and when rate increases  
23           or adjustments are necessary, those proposed adjustments will  
24           be presented to a water advisory board which is made up of  
25           customers of the Sandy City water system. The current

1 composition of that board includes eight individuals, two of  
2 who are representatives of customers in the unincorporated  
3 areas. The current advisory board chairman is a non-Sandy  
4 City resident. Once that committee has approved the rates  
5 suggested by my department, the rates are ultimately approved  
6 the City Council and the Mayor.

7 Q. Will Sandy City continue to have non-resident representatives  
8 on its Water Advisory Board?

9 A. Yes. Sandy City is committed, so long as it serves surplus  
10 water to non-residents to have those individuals represented  
11 on the Water Advisory Board.

12 Q. Are the number of non-resident members on the Water Advisory  
13 Board proportionate to the number of non-resident customers of  
14 Sandy City?

15 A. Yes. In fact, the total number of non-resident customers is  
16 610, excluding the Union Jordan customers whose rate is  
17 governed by a special contract. The number of resident  
18 customers is approximately 21,000. As you can tell, two  
19 representatives on the Water Advisory Board are, on a  
20 proportionate basis, similar to the composition of Sandy City  
21 customers.

22 Q. Does Sandy City have any concerns about its current bonding?

23 A. Yes. The purchase of the White City Water Company cannot

1 result in any negative implications for Sandy City's bonds.  
2 Sandy City's current bond financing for water improvements  
3 include a refunding bond for ongoing capital improvements.  
4 This bonding includes all necessary future expansion for its  
5 anticipated growth. The financing for the White City purchase  
6 will be with a separate bond issued by the Municipal Building  
7 Authority and is consistent with the expansion plans of Sandy  
8 City. In addition, both programs anticipate the integration  
9 of the systems over time to minimize the necessary capital  
10 improvements for the systems.

11 Q. Does Sandy City have the water resources necessary to  
12 accommodate its growth and any growth likely to occur in the  
13 White City Water Company service territory?

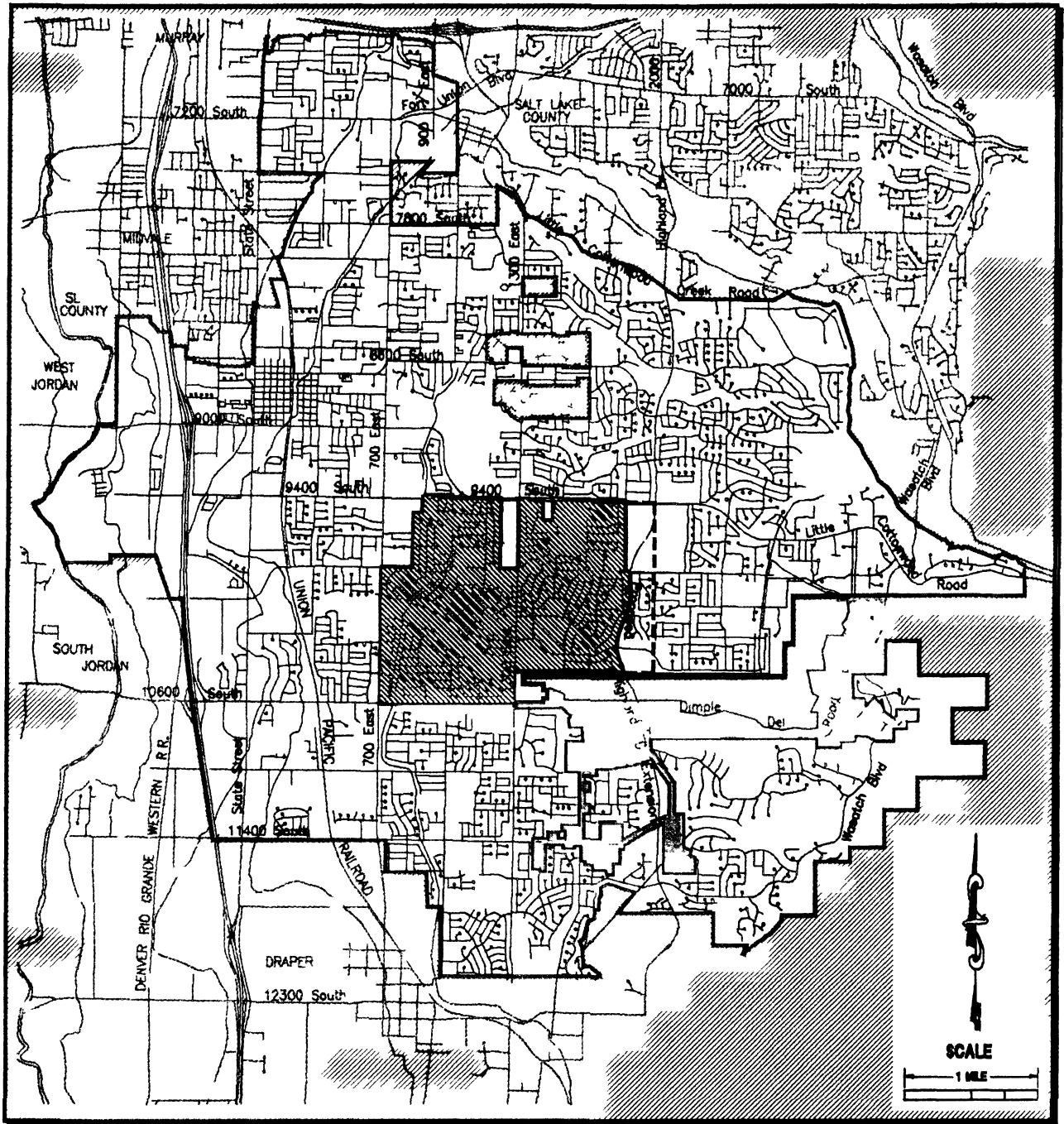
14 A. Yes. In addition to the resources which Sandy City directly  
15 owns, Sandy City's recent annexation into the Metropolitan  
16 Water District of Salt Lake City has significantly added to  
17 the water supply capabilities of Sandy City. The Metropolitan  
18 Water District of Salt Lake City provides Sandy City the most  
19 stable, reliable and least cost water source available. As  
20 the White City Water Company is integrated into Sandy City's  
21 system, White City water customers will be the beneficiaries  
22 of the Metropolitan District's superior service reliability.

23 Q. Do you have any last statements for the Commission?


24 A. Yes. As the Mayor will also indicate, Sandy City needs to

1       acquire the White City Water Company in order to assure the  
2       safe and adequate supply of water to residents of Sandy City.  
3       Sandy City also believes that the acquisition is essential to  
4       the long-term, rational planning for water service in Sandy  
5       City, as well as the area currently served by the White City  
6       Water Company. Sandy City also believes that municipalities  
7       are best suited to the provision of municipal services, such  
8       as the supply of water, over the long-term. Indeed, with the  
9       increasingly rigorous state and federal requirements for  
10      culinary water suppliers, it may be that only municipalities  
11      will be able to meet the culinary water needs of urban  
12      citizens. Admittedly, there may be some short-term discomfort  
13      with Sandy City serving non-residents. Sandy City submits,  
14      however, that it has traditionally treated non-resident  
15      customers fairly, and will continue to do so. Sandy City is  
16      not doing anything beyond the type of long-term, rational  
17      water department planning which has allowed it to accommodate  
18      the enormous growth which has occurred in Sandy City.  
19      Continued urban growth will only be facilitated by the  
20      integration, not duplication, of service in order to minimize  
21      the cost of culinary water service.

Tab 1



## LEGEND OF WATER RETAIL PROVIDERS

 SANDY CITY CORPORATE AREA

 SANDY RESIDENTS SERVED BY BELL CANYON WATER COMPANY

 SANDY RESIDENTS SERVED BY WHITE CITY WATER COMPANY

 SALT LAKE COUNTY RESIDENTS SERVED BY BELL CANYON WATER COMPANY

 SALT LAKE COUNTY RESIDENTS SERVED BY WHITE CITY WATER COMPANY

 SALT LAKE COUNTY WATER CONSERVANCY DISTRICT SERVICE AREA

 OTHER WATER RETAILERS OUTSIDE SANDY CITY SERVICE AREA

— SANDY CITY WATER SERVICE BOUNDARY

— WHITE CITY WATER CO -CURRENT SERVICE AREA

--- WHITE CITY WATER CO -CERTIFICATED SERVICE AREA

— BELL CANYON WATER CO -SERVICE AREA

— SALT LAKE COUNTY WATER CONSERVANCY DISTRICT-SERVICE AREA

— DIMPLE DELL REGIONAL PARK

JANUARY 29, 1993

**EXHIBIT**



**ECKHOFF WATSON AND PREATOR ENGINEERING**

ENGINEERS PLANNERS SURVEYORS

SALT LAKE CITY

**PIPE NETWORK MAP OF WATER RETAILERS  
IN THE SANDY CITY VICINITY**

Tab 2



**SANDY CITY  
FEE SCHEDULE  
FOR THE YEAR ENDING JUNE 30, 1993**

DESCRIPTION	CURRENT	RECOMMENDED CHANGES
<b>WATER RATES</b>		(Effective 1/1/93)
Sandy City - Residential/Commercial		
Minimum	\$.295/unit/day	\$.304/unit/day
Overage	\$.54/thousand gallons	\$.56/thousand gallons
Sandy City - Senior Citizens		
Minimum	\$.21/unit/day	\$.216/unit/day
Overage	\$.45/thousand gallons	\$.46/thousand gallons
Union Jordan - Residential/Commercial		
Minimum	\$.4/unit/day	\$.412/unit/day
Overage	\$.54/thousand gallons	\$.56/thousand gallons
Union Jordan - Senior Citizens		
Minimum	\$.28/unit/day	\$.288/unit/day
Overage	\$.45/thousand gallons	\$.46/thousand gallons
Salt Lake County - Residential/Commercial		
Minimum	\$.549/unit/day	\$.565/unit/day
Overage	\$.69/thousand gallons	\$.71/thousand gallons
Granite Water Stock		
Minimum	\$.295/unit/day	\$.304/unit/day
Overage	\$.54/thousand gallons	\$.56/thousand gallons
Schools	\$.55/thousand gallons	\$.57/thousand gallons

**SANDY CITY  
FEE SCHEDULE  
FOR THE YEAR ENDING JUNE 30, 1993**

DESCRIPTION	CURRENT	RECOMMENDED CHANGES
<b>WATER - MISCELLANEOUS FEES</b>		
Meter Rereads	\$10	
Meter Turn On - Non Payment		
Regular Business Hours	\$20	
After 4:30 P.M.	\$25	
Meter Turn On - Customer Request	\$10	
Testing Meter	\$20	
Late Payment Fee	\$10	
Hydrant Use Fees		
Administration Charges	\$50/mo	
Water Use	\$.54/1,000 gal.	\$.56/thousand gallons
Refundable Deposit	\$600	
Construction Water	\$10	
Trailer Courts	10% reduction in total bill	
<b>WATER REVIEW FEES</b>		
Subdivision	\$146	
Single Lot	\$30	
Commercial/Industrial	\$70	

Fees can be waived or deferred only in accordance with the administrative appeal procedure under standards set by the City Council. All fees waived or deferred must be documented and submitted to the City Treasurer. Any fee determined to be uncollectable must be approved to be written-off by the Finance Director.

Tab 3

# ANALYSIS OF THE "OUTSIDE THE CITY" WATER RATE

Prepared for

PARSONS BEHLE AND LATIMER

and

SANDY CITY DEPARTMENT OF PUBLIC WORKS

January 1993

Prepared by



Eckhoff, Watson and Preator Engineering

## **Analysis of "Outside the City" Water Rate**

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# **Analysis of the "Outside the City" Water Rate**

## **Chapter One - INTRODUCTION**

### **Purpose**

The purpose of this study is to review the "outside the city" water rate that Sandy City charges its customers outside the corporate limits of the City.

### **Methodology**

This analysis follows procedures recommended by the American Water Works Associations (AWWA) and their publications modified to conditions found in Sandy City. The procedure used herein involves "the determination and allocation of the costs of service to the various classes of customers, as well as the development of rates to equitably recover the cost of service from each class of customer." The procedures used "are based on principles that are generally accepted and widely followed throughout the industry."

The procedure suggested by the AWWA includes the following:

1. Determination of the total annual revenue requirements for the period for which the rates are to be effective.
2. Allocation of the total annual revenue requirements to the basic functional cost components.
3. Distribution of the component costs to the various customer classes in accordance with their requirements for service.
4. Design of water rates that will recover the cost of service from each customer class within practical limits.

### **Concurrent Study**

The Sandy City Department of Public Works has recently concluded the *1992 Water System Master Plan and Capital Improvement Plan*. The Capital Improvements suggested by that document are used in this analysis.

## **Key Assumptions**

**This Analysis of the "Outside the City" Water Rate assumed the following:**

**As an enterprise fund, the Water Division would remain self funding.**

**The current rate categories would remain: city class (resident, multi-family, senior citizen, Granite, and commercial), county (i.e. outside the city resident, multi-family, and commercial), Union-Jordan (resident, senior citizen, multi-family, and commercial), schools, and other municipal functions.**

**This study followed procedures recommended by the American Water Works Associations (AWWA) and develops a rate structure that recovers costs based upon the "cost of service." As provided for by the AWWA, outside the city customers would be allocated costs using the "Utility Basis."**

**The rate structure of a base monthly cost which includes a fixed amount of water (6,000 gallons of water per month) and a fixed unit cost for water consumption over the minimum will be continued.**

**Customers of the Union-Jordan system would be allocated costs as provided for in the contract that resulted in Sandy City purchasing that system.**

**Water Conservation would not significantly affect the consumption of water.**

**The cost of testing for Federal Safe Drinking Water regulations will be about \$225,000 per year.**



## **Chapter Two - WATER USE CHARACTERISTICS**

The Sandy City Water Division provides water not only to the City proper but also to areas of unincorporated Salt Lake County. Table II-1 provides a history and forecast of Sandy City population and households. These can be classified into two general categories: inside the city and outside the city customers. A subset of the "outside" customers are the "Union-Jordan" (UJ) customers that were part of the Union-Jordan Water System. That system was purchased by Sandy City in 1973 and, by contract, those customers have a different rate than other outside the city customers. This analysis does not include the Union-Jordan customers.

In order to appropriately recover the cost of providing water service, the characteristics of the various customers are needed. This chapter reviews historical information to develop a profile. This information is then combined with other data to develop a forecast of water use for the next five years.

### **Data Utilization and Limitations**

Information used throughout this document comes from several sources:

*Water Billing Records - 1989, 1990, and 1991 from the Sandy City Finance Department (used to forecast unit consumption);*

*Annual Financial Reports on the Water Division and number of accounts (not customers) for 1985 to 1991 as provided by the Sandy City Finance Department;*

*Water Production Records - 1985 through 1991 from the Sandy City Water Division ; and*

*Population History and Forecasts from the Sandy City Planning Department.*

The information has certain limitations. Detailed water billing records were not available prior to 1989. Further, residential water meters (the source of this information) are not read during winter months and only bi-monthly during the peak use months.

The demand for water is important in the development of a rate structure in that much of the physical resources of the Water Division is constructed to meet peak demand.

The seasonal characteristics of the residential user is of primary importance since that

**Table II 1**  
**Sandy City Population/Household Projections**

<b>Year</b>	<b>City Population</b>	<b>City Households</b>
1985	65,732	16,985
1986	68,042	17,871
1987	72,586	18,983
1988	73,400	19,500
1989	74,200	20,037
1990	75,058	20,293
1991	77,250	20,549
1992	78,016	20,806
1993	78,976	21,062
1994	79,937	21,318
1995	80,898	21,574
2000	86,467	23,059
2005	92,036	24,545
2010	97,605	26,030
2015	103,174	27,515
2020	108,744	29,000

Source: Sandy City Planning Department

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class represents the overwhelming demand on the Water Division. As indicated above, residential water meters are not read in the winter. The monthly distribution of residential water use was estimated by distributing the average residential household use with the same frequency distribution of water production for 1989, 1990 and 1991. These records for 1989, 1990, and 1991 are the only data on consumption by customer class.

Average annual water use (1989-1991) per residential user was about 0.87 acre feet or 281,300 gallons of water. Peak monthly use generally occurs in July and averages about 54,000 gallons. This information is detailed in Table II-2.

### **Historic Use Trends by Customer Classification**

Billing records (by customer) for 1989, 1990, and 1991 were analyzed to view trends in water use. This information is summarized for fourteen different customer types in Table II-3. The use of water is greatly influenced by climatic conditions. Late spring or summer precipitation can greatly reduce the need for "artificial irrigation", the primary outdoor use. A review of the information in Table II-3 indicates that there can be a sizable year to year consumption variation within as well as between different use categories.

The historic trends in the number of "units" in customer classes is shown in Table II-4. (Units are distinguished from accounts in that, for example, multifamily accounts will have more than one unit.) This data is used because of the long historical trend was available. It can be seen that on an overall basis, the number of "customer units" have grown at an average annual rate of 3.1% over the last seven years. (Population, however, has grown by about 3.5% in the same time period.) In most customer categories, the actual average annual change in the number of customer units is used to forecast the future number of customers. In other cases, a refinement is suggested to be a more reasonable view. The overall system average of about 3% is used.

### **Future Trends in Customer Classification**

The projected number of customers by classification from 1992 through 1997 is shown in Table II-5. It is estimated that the Sandy City Water Division will have almost 26,000 accounts by 1997.

By multiplying the average water use for each customer category, as detailed in Table II-3, by the estimated number of accounts for each classification, as detailed in Table II-5, Table II-6, projected water demand, is developed for each category. Table II-6 indicates that projected 1997 water deliveries will be on the order of 26,000 acre feet

**Table II-2**  
**Sandy City Average Monthly Residential Use**  
**(1000 Gallons)**

**Aggregate of 1989, 1990, 1991**

	Total	Indoor Use	Outdoor
JANUARY	8.42	8.39	0.03
FEBRUARY	7.40	8.39	-0.99
MARCH	8.54	8.39	0.14
APRIL	16.56	8.39	8.17
MAY	27.79	8.39	19.40
JUNE	40.75	8.39	32.36
JULY	54.07	8.39	45.68
AUGUST	44.61	8.39	36.22
SEPTEMBER	32.55	8.39	24.16
OCTOBER	23.03	8.39	14.64
NOVEMBER	8.97	8.39	0.58
DECEMBER	8.62	8.39	0.23
<b>Total</b>	<b>281.30</b>	<b>100.69</b>	<b>180.61</b>

0.87 Acre Feet

Average Annual Use per residential Customer

Based Upon Monthly Distribution from Production Records

Indoor Use estimated as the average of January, February, March, November, and December

Outdoor Use estimated as difference between Total Use and Indoor Use

**Table II-3**  
**Gandy City Historic Water Consumption**  
**(Compiled from Billing Records)**

<b>1989</b>				
	<b>Average (AF)</b>	<b>Average (K Gals)</b>	<b># of Accounts</b>	<b>Total (M Gals)</b>
City Comm'l	2.40	780.38	434	338.7
City MultiFamily	1.52	493.92	181	89.4
City Senior	0.64	207.07	273	56.5
Granite (City Rates)	0.70	226.76	74	16.8
City Single Family	0.93	302.25	14,041	4,243.9
County Comm'l	2.22	720.00	4	2.9
County MultiFamily	1.39	451.50	4	1.8
County Single Family	0.81	263.10	495	130.2
Schools	36.17	11,754.47	36	423.2
UJ Comm'l	2.28	739.94	62	45.9
UJ MultiFamily	2.12	690.00	47	32.4
UJ Senior	0.55	179.11	133	23.8
UJ Single Family	0.77	249.10	1,806	449.9
Parks & Recreation	16.38	5,323.97	59	314.1
Other	17.07	5,548.50	14	77.7
System wide	1.09	353.69	17,663	6,247.2

<b>1990</b>				
	<b>Average (AF)</b>	<b>Average (K Gals)</b>	<b># of Accounts</b>	<b>Total (M Gals)</b>
City Comm'l	2.25	729.72	473	345.2
City MultiFamily	1.47	479.13	189	90.6
City Senior	0.61	196.66	273	53.7
Granite (City Rates)	0.89	288.00	78	22.5
City Single Family	0.90	291.52	15,828	4,614.2
County Comm'l	15.09	4,904.00	5	24.5
County MultiFamily	1.35	438.75	4	1.8
County Single Family	0.76	248.39	545	135.4
Schools	32.83	10,669.97	36	384.1
UJ Comm'l	2.03	660.73	67	44.3
UJ MultiFamily	2.01	654.51	49	32.1
UJ Senior	0.52	167.43	133	22.3
UJ Single Family	0.71	232.31	1,878	436.3
Parks & Recreation	9.82	3,192.10	68	217.1
Other	17.32	5,628.42	12	67.5
System wide	1.02	330.55	19,638	6,491.3

**Table II-3 (Continued)**  
**Sandy City Historic Water Consumption**  
**(Compiled from Billing Records)**

1491

	Average (AF)	Average (K Gals)	# of Accounts	Total (M Gals)
City Comm'l	2.15	697.58	490	341.8
City MultiFamily	1.58	513.39	196	100.6
City Senior	0.53	172.70	269	46.5
Granite (City Rates)	0.86	279.26	80	22.341
City Single Family	0.79	256.66	17,376	4,459.7
County Comm'l	1.38	449.80	5	2.2
County MultiFamily	1.03	334.75	4	1.3
County Single Family	0.67	216.66	594	128.7
Schools	28.18	9,159.36	36	329.7
UJ Comm'l	1.86	603.37	67	40.4
UJ MultiFamily	1.92	623.18	49	30.5
UJ Senior	0.45	147.79	131	19.4
UJ Single Family	0.62	200.16	1,974	395.1
Parks & Recreation	11.89	3,863.98	84	324.6
Other	14.78	4,803.50	14	67.2
<b>System wide</b>	<b>0.90</b>	<b>292.34</b>	<b>21,355</b>	<b>6,243.0</b>

**Aggregate of 1989, 1990, 1991**

	Average (AF)	Average (K Gals)	# of Accounts	Total (M Gals)
City Comm'l	2.26	735.89	466	341.9
City MultiFamily	1.52	495.48	189	93.5
City Senior	0.59	192.14	272	52.2
Granite (City Rates)	0.81	264.67	77	20.5
City Single Family	0.87	283.48	15,748	4439.3
County Comm'l	6.23	2,024.60	5	9.9
County MultiFamily	1.26	408.33	4	1.6
County Single Family	0.75	242.71	545	131.4
Schools	32.39	10,527.94	36	379.0
UJ Comm'l	2.06	668.01	65	43.5
UJ MultiFamily	2.02	655.90	48	31.7
UJ Senior	0.51	164.77	132	21.8
UJ Single Family	0.70	227.19	1,886	427.1
Parks & Recreation	12.70	4,126.68	70	285.3
Other	16.39	5,326.81	13	70.8
<b>System wide</b>	<b>1.00</b>	<b>325.53</b>	<b>19,552</b>	<b>6327.1</b>

Table II-4  
**Sandy City Growth in Customer Base**  
 (Compiled from Billing Records)

	1985	1986	1987	1988	1989	1990	1991	Average Annual Change	Projected Change (%)
City Comm'l	785	844	973	1,009	1,067	1,067	1,051	4.8%	4.8%
City MultiFamily	897	953	1,091	1,177	1,207	1,370	1,368	7.5%	7.5%
City Senior	259	256	269	260	268	264	264	0.6%	0.6%
Granite (City Rates)	87	90	92	80	83	83	84	0.5%	0.0%
City Single Family	13,661	14,183	14,888	15,422	15,843	16,404	17,020	3.5%	3.5%
County Comm'l	6	5	6	7	8	8	8	4.8%	4.8%
County MultiFamily	19	19	19	19	19	20	20	0.8%	0.8%
County Single Family	554	570	580	565	579	590	600	1.2%	1.2%
Schools	33	36	37	38	38	38	38	2.2%	2.2%
UJ Comm'l	162	170	191	213	194	194	206	3.9%	3.9%
UJ MultiFamily	735	738	761	714	700	708	708	0.6%	0.0%
UJ Senior	171	171	183	175	137	132	132	3.4%	0.0%
UJ Single Family	2,462	2,475	2,463	2,474	2,261	2,268	2,270	1.1%	0.0%
Parks & Recreation	N/A	N/A	N/A	N/A	68	68	84	7.8%	1.0%
Other	N/A	N/A	N/A	N/A	198	211	212	2.4%	1.0%
<b>TOTAL Units</b>	<b>19,838</b>	<b>20,513</b>	<b>21,553</b>	<b>22,156</b>	<b>22,670</b>	<b>23,425</b>	<b>24,077</b>	<b>3.1%</b>	<b>3.1%</b>

\* A dashed line indicates projected future customer base.

**Table II-5**  
**Sandy City Projected Customer Base**  
**(Accounts)**

	1992	1993	1994	1995	1996	1997
City Comm'l	514	538	564	591	619	649
City MultiFamily	211	227	243	262	281	302
City Senior	270	272	273	275	277	278
Granite (City Rates)	80	80	80	80	80	80
City Single Family	17,984	18,614	19,265	19,939	20,637	21,360
County Comm'l	5	5	6	6	6	7
County MultiFamily	4	4	4	4	4	4
County Single Family	601	608	615	623	630	638
Schools	37	38	38	39	40	41
UJ Comm'l	70	72	75	78	81	84
UJ MultiFamily	49	49	49	49	49	49
UJ Senior	131	131	131	131	131	131
UJ Single Family	1,974	1,974	1,974	1,974	1,974	1,974
Parks & Recreation	85	86	87	87	88	89
Other	14	14	14	15	15	15
	<b>21,930</b>	<b>22,612</b>	<b>23,319</b>	<b>24,051</b>	<b>24,810</b>	<b>25,597</b>
 New City Customers		671	696	721	747	775
New County Customers		7	8	8	8	8

**Base Accounts Used from Table II-3**  
**Growth Rates from Table II-4**



**Table II-5**  
**Sandy City Projected Water Demand**  
**(Systemwide Consumption)**

<b>Acre Feet</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
City Comm'l	1,163	1,219	1,277	1,338	1,403	1,470
City MultiFamily	321	345	371	399	429	461
City Senior	160	161	162	163	163	164
Granite (City Rates)	65	65	65	65	65	65
City Single Family	86	16,235	16,804	17,392	18,001	18,631
County Comm'l	33	34	36	38	39	41
County MultiFamily	5	5	5	5	5	5
County Single Family	449	454	460	465	471	476
Schools	1,191	1,217	1,244	1,270	1,298	1,326
UJ Comm'l	143	149	154	160	167	173
UJ MultiFamily	99	99	99	99	99	99
UJ Senior	66	66	66	66	66	66
UJ Single Family	1,380	1,380	1,380	1,380	1,380	1,380
Parks & Recreation	1,077	1,088	1,099	1,110	1,121	1,132
Other	232	234	236	239	241	244
	22,071	22,752	23,458	24,190	24,948	25,734

<b>1,000 Gallons</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
City Comm'l	377,896	396,036	415,045	434,967	455,846	477,726
City MultiFamily	104,397	112,227	120,644	129,692	139,419	149,875
City Senior	51,971	52,257	52,546	52,836	53,127	53,420
Granite (City Rates)	21,174	21,174	21,174	21,174	21,174	21,174
City Single Family	5,098,092	5,276,525	5,461,204	5,652,346	5,850,178	6,054,934
County Comm'l	10,609	11,118	11,652	12,211	12,797	13,411
County MultiFamily	1,646	1,658	1,670	1,683	1,696	1,708
County Single Family	145,882	147,613	149,364	151,135	152,928	154,742
Schools	387,209	395,590	404,153	412,901	421,838	430,969
UJ Comm'l	46,502	48,316	50,200	52,158	54,192	56,306
UJ MultiFamily	32,139	32,139	32,139	32,139	32,139	32,139
UJ Senior	21,585	21,585	21,585	21,585	21,585	21,585
UJ Single Family	448,470	448,470	448,470	448,470	448,470	448,470
Parks & Recreation	350,108	353,609	357,145	360,716	364,323	367,967
Other	75,321	76,074	76,835	77,603	78,379	79,163
	7,173,002	7,394,391	7,623,826	7,861,617	8,108,092	8,363,591

Average Water Use from Table II-3

Number of Customers from Table II-5

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or just under 8,400,000 thousand gallons of water.

### **Peaking Characteristics**

The peak usage characteristics of the different types of customers is important in assessing the cost of providing water service. Table II-7 analyzes historic peaking characteristics. It can be seen that the ratio of peak month to average month is on the order of 2.5 for residential use, 2.6 for commercial, and 3.0 or higher for schools.

### **Meter Sizes**

In some instances, the cost of service is most closely related to meter size (or equivalent meter size) and not amount of water delivered. Table II-8 lists the distribution of water meters by size and equivalency. The "equivalent" meters relate size to physical plant capacity needed to serve that connection as described in "Water Rates", American Water Works Association, Manual M1, Fourth Edition, 1991.

**Table II-7**  
**Seasonal Peaking Characteristics**  
**(Systemwide Deliveries)**

Aggregate of 1991	Average Month (1,000 Gallons)			
	Residential	Commercial	School	Total
JANUARY	159.5	11.0	3.7	174.2
FEBRUARY	139.9	20.7	4.0	164.6
MARCH	161.1	14.0	4.3	179.5
APRIL	306.5	59.7	19.3	385.5
MAY	511.8	91.3	36.7	639.8
JUNE	768.4	91.0	55.7	915.1
JULY	1,021.8	192.7	83.3	1,297.8
AUGUST	840.9	136.3	73.0	1,050.2
SEPTEMBER	611.5	200.7	53.0	865.2
OCTOBER	433.4	106.0	37.0	576.4
NOVEMBER	169.0	96.3	5.7	271.0
DECEMBER	162.2	13.0	3.3	178.6
Average Month	440.5	86.1	31.6	558.1

Aggregate of 1989, 1990, 1991	Peak Month (1,000 Gallons)			Total
	Residential	Commercial	School	
JANUARY	179.1	15.0	4.0	198.1
FEBRUARY	154.2	22.0	4.0	180.2
MARCH	170.3	17.0	5.0	192.3
APRIL	364.9	64.0	25.0	453.9
MAY	639.8	104.0	48.0	791.8
JUNE	822.3	107.0	62.0	991.3
JULY	1,140.3	241.0	110.0	1,491.3
AUGUST	918.8	140.0	82.0	1,140.8
SEPTEMBER	674.4	264.0	65.0	1,003.4
OCTOBER	476.7	115.0	43.0	634.7
NOVEMBER	176.6	137.0	7.0	320.6
DECEMBER	167.8	24.0	5.0	196.8

R				
Aggregate of 1989, 1990, 1991				
	Residential	Commercial	School	Total
Three Year Average	2.32	2.24	2.64	2.33
Three Year Peak	2.59	2.80	3.48	2.67

**Peak System Month is July**

Based Upon Monthly Distribution of

**Table II-8**  
**Distribution of Meter Sizes (1991)**

<b>Meter Size (Inches)</b>	<b>% of System</b>	<b>Estimated Meters</b>	<b>Equivalent Meter- and-Service Ratio (1)</b>	<b>Equivalent Meters (2)</b>	<b>Equivalent % of System</b>
3/4 and 5/8	88.27%	20410	1.0	20,410	80.09%
1	10.09%	2332	1.4	3,266	12.82%
1 1/2	0.62%	143	1.8	257	1.01%
2	0.66%	153	2.9	444	1.74%
3	0.14%	32	11.0	352	1.38%
4	0.19%	45	14.0	630	2.47%
6	0.03%	6	21.0	126	0.49%
8	0.00%	0	29.0	0	0.00%
<b>Total</b>	<b>100%</b>	<b>23,122</b>		<b>25,485</b>	<b>100%</b>

(1) From "Water Rates", American Water Works Association Manual M1 Fourth Edition 1991 Modified; ratio of meter size to 3/4 and 5/8 inch meter.

(2) Equivalent to 3/4 and 5/8 inch meters

### **Chapter Three - CAPITAL IMPROVEMENTS PLAN**

The cost of implementing the *1992 Water System Master Plan and Capital Improvements Plan* is a major component of the annual budget of the Sandy City Water Division. Concurrently with the development of this report, Sandy City undertook a periodic revisit of its need to construct facilities.

Table III-1 displays the proposed Capital Improvement Plan through 1997. Table III-2 provides an anticipated year by year construction schedule.

**TABLE III-1**  
**SANDY CITY**  
**WATER SYSTEM IMPROVEMENTS**  
**BUDGETARY COST ESTIMATE**

(Source: 1992 Sandy City Water System Master Plan and Capital Improvements Plan, EWP Engineering)

Priority	Item	Description	Quantity	Unit	Unit Cost	Amount
I	1.	<b>25 mgd Booster Pump Station and Metro Transmission Water line</b>				
		a. pump station building/site	1	Job	\$100,000	\$100,000
		b. pump station mechanical/pumps	1	Job	\$505,000	\$505,000
		c. pump station electrical/control	1	Job	\$90,000	\$90,000
		d. 36" dip water line	3900	L.F.	\$100	\$390,000
		e. 20" dip water line	600	L.F.	\$55	\$33,000
		f. water line valves, connections and fit-up	1	Job	\$63,000	\$63,000
						<u>\$1,181,000</u>
					15% contingency	<u>\$177,000</u>
						<u>\$1,358,000</u>
		(Scheduled for FY 1993)		engineering, legal, admin. and construction eng.		<u>\$204,000</u>
						<u>\$1,562,000</u>
I	2.	<b>8 Million Gallon Storage Tank and 36" Supply line</b>				
		a. excavation	1	Job	\$115,000	\$115,000
		b. tank construction	1	Job	\$1,760,000	\$1,760,000
		c. backfill	1	Job	\$135,000	\$135,000
		d. site work/valving	1	Job	\$170,000	\$170,000
		e. 36" dip water line	800	L.F.	\$110	\$88,000
						<u>\$2,268,000</u>
					15% contingency	<u>\$340,000</u>
						<u>\$2,608,000</u>
		(Scheduled for FY 1993 and FY 1994)		engineering, legal, admin. and construction eng.		<u>\$391,000</u>
						<u>\$2,999,000</u>
I	3.	<b>20" Water line to Willow Bend Drive</b>				
		<b>(through Willow Creek Canyon Estates)</b>				
		a. 20" dip water line	4200	L.F.	\$55	\$231,000
		b. asphalt trench repair (6' wide)	2400	L.F.	\$10	\$24,000
		c. water line valves, connections and fit-up	1	Job	\$20,000	\$20,000
						<u>\$275,000</u>
					15% contingency	<u>\$41,000</u>
						<u>\$316,000</u>
		(Scheduled for FY 1993)		engineering, legal, admin. and construction eng.		<u>\$47,000</u>
						<u>\$363,000</u>
I	4.	<b>20" Water line in Woodchuck Way</b>				
		a. 20" dip water line	4000	L.F.	\$55	\$220,000
		b. 16" dip water line (Quail Hollow Drive)	300	L.F.	\$40	\$12,000
		c. 12" dip water line (Falcon Way)	600	L.F.	\$30	\$18,000
		d. asphalt trench repair (6' wide)	4900	L.F.	\$10	\$49,000
		e. water line valves, connections and fit-up	1	Job	\$30,000	\$30,000
						<u>\$329,000</u>
					15% contingency	<u>\$49,000</u>
						<u>\$378,000</u>
		(Scheduled for FY 1995)		engineering, legal, admin. and construction eng.		<u>\$57,000</u>
						<u>\$435,000</u>
<b>PRIORITY I SUBTOTAL</b>						<u><u>\$5,359,000</u></u>

**TABLE III-1**  
**SANDY CITY**  
**WATER SYSTEM IMPROVEMENTS**  
**BUDGETARY COST ESTIMATE**

(Source: 1992 Sandy City Water System Master Plan and Capital Improvements Plan, EWP Engineering)

Priority	Item	Description	Quantity	Unit	Unit Cost	Amount
II	5.	12" Water line and PRV in Snow Mountain Drive				
	a.	12" dip water line	2400	L.F.	\$30	\$72,000
	b.	asphalt trench repair (6' wide)	2400	L.F.	\$10	\$24,000
	c.	PRV vault and valving	1	Job	\$25,000	\$25,000
	d.	water line valves, connections and fit-up	1	Job	\$10,000	\$10,000
						\$131,000
					15% contingency	\$20,000
						\$151,000
	(Scheduled for FY 1996)			engineering, legal, admin. and construction eng.		\$23,000
						\$174,000
II	6.	16" Water line in 9400 South				
	a.	16" dip water line	5000	L.F.	\$40	\$200,000
	b.	asphalt trench repair (6' wide)	5000	L.F.	\$10	\$50,000
	c.	asphalt overlay (30' wide)	5000	L.F.	\$15	\$75,000
	d.	water line valves, connections and fit-up	1	Job	\$15,000	\$15,000
						\$340,000
					15% contingency	\$51,000
						\$391,000
	(Scheduled for FY 1996)			engineering, legal, admin. and construction eng.		\$59,000
						\$450,000
II	7.	MWD Well (upfront cost by MWD)				
	a.	rehab. of existing well	1	Job	\$300,000	\$0
II	8.	10" Water line in Viscounti Drive				
	a.	10" dip water line	300	L.F.	\$20	\$6,000
	b.	asphalt trench repair (6' wide)	300	L.F.	\$10	\$3,000
	c.	water line valves, connections and fit-up	1	Job	\$1,500	\$1,500
						\$10,500
					15% contingency	\$1,500
						\$12,000
	(Scheduled for FY 1996)			engineering, legal, admin. and construction eng.		\$2,000
						\$14,000
II	9.	Variable Speed Drivers				
	a.	variable speed drivers for union jordan wells	3	Each	\$30,000	\$90,000
	(Scheduled for FY 1996)					
PRIORITY II SUBTOTAL						\$728,000
III	10.	16" Water lines in 1300 East, 700 East and 8600 South				
	a.	16" dip water line	5800	L.F.	\$40	\$232,000
	b.	asphalt trench repair (6' wide)	5800	L.F.	\$10	\$58,000
	c.	asphalt overlay (30' wide)	5800	L.F.	\$15	\$87,000
	d.	water line valves, connections and fit-up	1	Job	\$20,000	\$20,000
						\$397,000

**TABLE III-1**  
**SANDY CITY**  
**WATER SYSTEM IMPROVEMENTS**  
**BUDGETARY COST ESTIMATE**

(Source: 1992 Sandy City Water System Master Plan and Capital Improvements Plan, EWP Engineering)

Priority	Item	Description	Quantity	Unit	Unit Cost	Amount
					15% contingency	\$60,000
						\$457,000
	(Scheduled for FY 1996)	engineering, legal, admin. and construction eng.				\$69,000
						\$526,000
III	11.	12" Water line in 1000 East				
	a.	12" dip water line	3200	L.F.	\$30	\$96,000
	b.	asphalt trench repair (6' wide)	3200	L.F.	\$10	\$32,000
	c.	water line valves, connections and fit-up	1	Job	\$12,000	\$12,000
						\$140,000
					15% contingency	\$21,000
						\$161,000
	(Scheduled for FY 1996)	engineering, legal, admin. and construction eng.				\$24,000
						\$185,000
III	12.	New Well (using rights from Haun and Mt. Jordan Wells)				
	a.	drill 800' well, complete with 20" casing	1	Job	\$225,000	\$225,000
	b.	building/mechanical/site	1	Job	\$300,000	\$300,000
						\$525,000
					15% contingency	\$79,000
						\$604,000
	(Scheduled for FY 1996)	engineering, legal, admin. and construction eng.				\$60,000
	c.	land acquisition	1	Each	\$30,000	\$30,000
						\$694,000
III	13.	16" Water lines in Hidden Valley Drive				
	a.	16" dip water line	800	L.F.	\$40	\$32,000
	b.	asphalt trench repair (6' wide)	800	L.F.	\$10	\$8,000
	c.	water line valves, connections and fit-up	1	Job	\$7,000	\$7,000
						\$47,000
					15% contingency	\$7,000
						\$54,000
	(Scheduled for FY 1997)	engineering, legal, admin. and construction eng.				\$8,000
						\$62,000
III	14.	16" Water line in Dimple Dell Road				
	a.	16" dip water line	6200	L.F.	\$40	\$248,000
	b.	asphalt trench repair (6' wide)	6200	L.F.	\$10	\$62,000
	c.	water line valves, connections and fit-up	1	Job	\$20,000	\$20,000
						\$330,000
					15% contingency	\$50,000
						\$380,000
	(Scheduled for FY 1997)	engineering, legal, admin. and construction eng.				\$57,000
						\$437,000
III	15.	16" Water line and PRV in 10600 South				
	a.	16" dip water line	4500	L.F.	\$40	\$180,000
	b.	asphalt trench repair (6' wide)	4500	L.F.	\$10	\$45,000
	c.	PRV vault and valving	1	Job	\$35,000	\$35,000



**TABLE III-1**  
**SANDY CITY**  
**WATER SYSTEM IMPROVEMENTS**  
**BUDGETARY COST ESTIMATE**

(Source: 1992 Sandy City Water System Master Plan and Capital Improvements Plan, EWP Engineering)

Priority Item	Description	Quantity	Unit	Unit Cost	Amount
	d. water line valves, connections and fit-up	1	Job	\$15,000	\$15,000
					\$275,000
				15% contingency	\$41,000
					\$316,000
(Scheduled for FY 1997)	engineering, legal, admin. and construction eng.				\$47,000
					\$363,000
				<b>PRIORITY III SUBTOTAL</b>	<b>\$2,267,000</b>

Note: Costs reflect furnished and installed prices.

Costs were determined using "Means Cost Data - 1992" publications, actual construction costs of previous projects and "Engineering News Record" cost estimating information.

Construction engineering includes only periodic observation, not construction administration.

*sub to change*

Table III-2  
SANDY CITY WATER SYSTEM IMPROVEMENTS  
BUDGETARY COST ESTIMATE BY CATEGORY

(Source: 1992 Sandy City Water Master Plan and Capital Improvement Plan)

Item	Description	Quantity	Unit	Unit cost	Total	1993	1994	1995	1996	1997
<b>LAND</b>										
1.	New Well (using rights from Haun and Mt. Jordan Wells)									
	land acquisition	1	Each	\$30,000	\$30,000				\$30,000	
<i>Sub Total - Land</i>					\$30,000	\$0	\$0	\$0	\$30,000	\$0
<b>BUILDINGS AND STRUCTURES</b>										
1.	New Well (using rights from Haun and Mt. Jordan Wells)									
	building/site	1	Job	\$100,000	\$100,000					
				15% contingency	\$15,000					
					\$115,000					
	engineering, legal, admin. and construction eng.				\$17,000					
					\$132,000				\$132,000	
2.	25 mgd Booster Pump Station and Metro Transmission Water Line									
	pump station building/site	1	Job	\$100,000	\$100,000					
				15% contingency	\$15,000					
					\$115,000					
	engineering, legal, admin. and construction eng.				\$17,000					
					\$132,000	\$132,000				
<i>Sub Total Buildings and Structures</i>					\$264,000	\$132,000	\$0	\$0	\$132,000	\$0
<b>DISTRIBUTION MAINS</b>										
1.	8 Million Gallon Storage Tank and '36" Supply line									
	36" dip water line	800	L.F.	\$110	\$88,000					
					\$88,000					
				15% contingency	\$13,000					
					\$101,000					
	engineering, legal, admin. and construction eng.				\$15,000					
					\$116,000	\$116,000				
2.	25 mgd Booster Pump Station and Metro Transmission Water Line									
	36" dip water line	3900	L.F.	\$100	\$390,000					
	20" dip water line	600	L.F.	\$55	\$33,000					
	water line valves, connections and fit-up	1	Job	\$63,000	\$63,000					
					\$486,000					
				15% contingency	\$73,000					
					\$559,000					
	engineering, legal, admin. and construction eng.				\$84,000					
					\$643,000	\$643,000				
3.	20" Water line to Willow Bend Drive (through Willow Creek Canyon Estates)									
	20" dip water line	4200	L.F.	\$55	\$231,000					
	asphalt trench repair (6' wide)	2400	L.F.	\$10	\$24,000					
	water line valves, connections and fit-up	1	Job	\$20,000	\$20,000					
					\$275,000					
				15% contingency	\$41,000					
					\$316,000					
	engineering, legal, admin. and construction eng.				\$47,000					
					\$363,000	\$363,000				
4.	20" Water line in Woodchuck Way									
	20" dip water line	4000	L.F.	\$55	\$220,000					
	16" dip water line (Quail Hollow Drive)	300	L.F.	\$40	\$12,000					
	12" dip water line (Falcon Way)	600	L.F.	\$30	\$18,000					
	asphalt trench repair (6' wide)	4900	L.F.	\$10	\$49,000					
	water line valves, connections and fit-up	1	Job	\$30,000	\$30,000					

Table III-2  
SANDY CITY WATER SYSTEM IMPROVEMENTS  
BUDGETARY COST ESTIMATE BY CATEGORY

(Source: 1992 Sandy City Water Master Plan and Capital Improvement Plan)

Item	Description	Quantity	Unit	Unit cost	Total	1993	1994	1995	1996	1997
					\$329,000					
				15% contingency	\$49,000					
					\$378,000					
	engineering, legal, admin. and construction eng.				\$57,000					
					\$435,000			\$435,000		
5.	12" Water line and PRV in Snow Mountain Drive									
	12" dip water line	2400	L.F.	\$30	\$72,000					
	asphalt trench repair (6' wide)	2400	L.F.	\$10	\$24,000					
	PRV vault and valving	1	Job	\$25,000	\$25,000					
	water line valves, connections and fit-up	1	Job	\$10,000	\$10,000					
					\$131,000					
				15% contingency	\$20,000					
					\$151,000					
	engineering, legal, admin. and construction eng.				\$23,000					
					\$174,000				\$174,000	
6.	16" Water line in 9400 South									
	16" dip water line	5000	L.F.	\$40	\$200,000					
	asphalt trench repair (6' wide)	5000	L.F.	\$10	\$50,000					
	asphalt overlay (30' wide)	5000	L.F.	\$15	\$75,000					
	water line valves, connections and fit-up	1	Job	\$15,000	\$15,000					
					\$340,000					
				15% contingency	\$51,000					
					\$391,000					
	engineering, legal, admin. and construction eng.				\$59,000					
					\$450,000				\$450,000	
7.	10" Water line in Viscount Drive									
	10" dip water line	300	L.F.	\$20	\$6,000					
	asphalt trench repair (6' wide)	300	L.F.	\$10	\$3,000					
	water line valves, connections and fit-up	1	Job	\$1,500	\$1,500					
					\$10,500					
				15% contingency	\$1,500					
					\$12,000					
	engineering, legal, admin. and construction eng.				\$2,000					
					\$14,000				\$14,000	
8.	16" Water lines in 1300 East, 700 East and 8600 South									
	16" dip water line	5800	L.F.	\$40	\$232,000					
	asphalt trench repair (6' wide)	5800	L.F.	\$10	\$58,000					
	asphalt overlay (30' wide)	5800	L.F.	\$15	\$87,000					
	water line valves, connections and fit-up	1	Job	\$20,000	\$20,000					
					\$397,000					
				15% contingency	\$60,000					
					\$457,000					
	engineering, legal, admin. and construction eng.				\$69,000					
					\$526,000				\$526,000	
9.	12" Water line in 1000 East									
	12" dip water line	3200	L.F.	\$30	\$96,000					
	asphalt trench repair (6' wide)	3200	L.F.	\$10	\$32,000					
	water line valves, connections and fit-up	1	Job	\$12,000	\$12,000					
					\$140,000					
				15% contingency	\$21,000					
					\$161,000					
	engineering, legal, admin. and construction eng.				\$24,000					
					\$185,000				\$185,000	

Table III-2  
SANDY CITY WATER SYSTEM IMPROVEMENTS  
BUDGETARY COST ESTIMATE BY CATEGORY

(Source: 1992 Sandy City Water Master Plan and Capital Improvement Plan)

Item	Description	Quantity	Unit	Unit cost	Total	1993	1994	1995	1996	1997
<b>10. 16" Water lines in Hidden Valley Drive</b>										
	16" dip water line	800	L.F.	\$40	\$32,000					
	asphalt trench repair (6' wide)	800	L.F.	\$10	\$8,000					
	water line valves, connections and fit-up	1	Job	\$7,000	\$7,000					
					<u>\$47,000</u>					
				15% contingency	\$7,000					
					<u>\$54,000</u>					
	engineering, legal, admin. and construction eng.				\$8,000					
					<u>\$62,000</u>					\$62,000
<b>11. 16" Water line in Dimple Dell Road</b>										
	16" dip water line	6200	L.F.	\$40	\$248,000					
	asphalt trench repair (6' wide)	6200	L.F.	\$10	\$62,000					
	water line valves, connections and fit-up	1	Job	\$20,000	\$20,000					
					<u>\$330,000</u>					
				15% contingency	\$50,000					
					<u>\$380,000</u>					
	engineering, legal, admin. and construction eng.				\$57,000					
					<u>\$437,000</u>					\$437,000
<b>12. 16" Water line and PRV in 10600 South</b>										
	16" dip water line	4500	L.F.	\$40	\$180,000					
	asphalt trench repair (6' wide)	4500	L.F.	\$10	\$45,000					
	PRV vault and valving	1	Job	\$35,000	\$35,000					
	water line valves, connections and fit-up	1	Job	\$15,000	\$15,000					
					<u>\$275,000</u>					
				15% contingency	\$41,000					
					<u>\$316,000</u>					
	engineering, legal, admin. and construction eng.				\$47,000					
					<u>\$363,000</u>					\$363,000
<b>Sub Total - Distribution Mains</b>					<u>\$3,768,000</u>	\$1,122,000	\$0	\$435,000	\$1,349,000	\$862,000
<b>PUMPS</b>										
<b>1. 25 mgd Booster Pump Station</b>										
	pump station mechanical/pumps	1	Job	\$595,000	\$595,000					
	pump station electrical/control	1	Job	\$99,000	\$99,000					
					<u>\$694,000</u>					
				15% contingency	\$104,000					
					<u>\$798,000</u>					
	engineering, legal, admin. and construction eng.				\$120,000					
					<u>\$918,000</u>		\$918,000			
<b>Sub Total - Pumps</b>					<u>\$918,000</u>	\$0	\$918,000	\$0	\$0	\$0
<b>WELLS</b>										
<b>1. MWD Well (upfront cost by MWD)</b>										
	rehab. of existing well	1	Job	\$300,000	\$0					
<b>2. New Well (using rights from Hawn and Mt. Jordan Wells)</b>										
	drill 800' well, complete with 20" casing	1	Job	\$225,000	\$225,000					
	mechanical/pumps	1	Job	\$200,000	\$200,000					
					<u>\$425,000</u>					
				15% contingency	\$64,000					
					<u>\$489,000</u>					
	engineering, legal, admin. and construction eng.				\$73,000					
					<u>\$562,000</u>					\$562,000
<b>3. Variable Speed Drivers</b>										

Table III-2  
SANDY CITY WATER SYSTEM IMPROVEMENTS  
BUDGETARY COST ESTIMATE BY CATEGORY

(Source: 1992 Sandy City Water Master Plan and Capital Improvement Plan)

Item	Description	Quantity	Unit	Unit cost	Total	1993	1994	1995	1996	1997
	variable speed drivers for union jordan well	3	Each	\$30,000	\$90,000				\$90,000	
<i>Sub Total - Wells</i>					\$652,000	\$0	\$0	\$0	\$652,000	\$0
<b>WATER TANKS</b>										
1. 8 Million Gallon Storage Tank										
	excavation	1	Job	\$115,000	\$115,000					
	tank construction	1	Job	\$1,760,000	\$1,760,000					
	beckfill	1	Job	\$135,000	\$135,000					
	site work/valving	1	Job	\$170,000	\$170,000					
					\$2,180,000					
				15% contingency	\$327,000					
					\$2,507,000					
	engineering, legal, admin. and construction eng.				\$376,000					
					\$2,883,000		\$1,407,000	\$1,476,000		
<i>Sub Total - Water Tanks</i>					\$2,883,000	\$0	\$1,407,000	\$1,476,000	\$0	\$0
<b>Total</b>					\$8,515,000	\$1,254,000	\$2,325,000	\$1,911,000	\$2,163,000	\$862,000

Note Costs reflect furnished and installed prices.

Costs were determined using "Means Cost Data - 1992" publications, actual construction costs

of previous projects and "Engineering News Record" cost estimating information.

Construction engineering includes only periodic observation, not construction administration.

## **Chapter Four - REVENUE REQUIREMENTS**

This chapter develops the future operating expenses. The basis of the forecasts is the Sandy City Annual Reports on the Water Division.

### **Details of Historic Operating Expenses**

Detail of historic operating expenses is shown in Table IV-1. This information is used as the basis for forecasting operating expenses in the various categories. Because the Water Division has undergone a dramatic change in the last four years, only information from that time period is used to estimate future operating expenses. In four cases (water purchases, utilities, professional fees, and water rights purchase) supplementary information was used. As can be seen on the table, over the last four years, the operating budget has increased by about 3.9% per year.

### **Water Production and Cost Projections**

Table IV-2 is a detailed forecast of sources of water and costs. These numbers are based upon the interlocal agreements made for the annexation of Sandy City into the Metropolitan Water District of Salt Lake City (MWDSLCL). Briefly, the interlocal agreements requires Sandy City to purchase specific and increasing amounts of water from the Salt Lake County Water Conservancy District through 2001. The rate for this water is also set by contract. Water purchases from the Metropolitan Water District of Salt Lake City is also governed by contract (MWDSLCL Resolution #1633). The cost of water used in Table IV-2 includes the recently updated rates from MWDSLCL. Pumping costs that are shown in the table are estimates of the cost of pumping from the various sources.

Both the cost of water purchases and pumping (utility) costs from Table IV-2 are used to develop future costs in these categories.

### **Anticipated Operating Expenses**

A forecast of future operating expenses is shown in Table IV-3. The escalation rates used are modifications of those developed in Table IV-1. Utilities and water purchases come from Table IV-2. Professional fees have been increased by \$225,000 per year to be used in the anticipated laboratory costs associated with the Federal Safe Drinking Water Regulations.

**Table IV-1**  
**Sandy City Water Division**  
**Details of Historic Operating Expenses**  
**(Cash Basis)**

	FY1985	FY1986	FY1987	FY1988	FY1989	FY1990	FY1991	FY1992	FY1993	Annual Average 4 Yr. Change	Annual Average 4 Yr. Change
<b>Operating Expenses</b>											
1100 Personnel	\$310,028	\$340,468	\$313,043	\$388,417	\$412,133	\$365,694	\$311,154	\$371,546	\$415,235	\$358,635	3.39%
1120 Overtime & Out of Class Pay	25,597	20,948	17,013	22,581	21,580	19,616	18,963	20,668	\$20,589	\$20,839	1.24%
1200 Temporary/Seasonal	26,003	23,959	18,281	42,484	32,832	23,918	59,484	29,156	\$28,950	\$31,674	5.26%
1300 Benefits	128,236	145,012	138,123	172,848	185,638	180,603	148,267	188,800	\$207,442	\$166,108	3.72%
1400 Uniform Allowance	4,226	4,835	2,890	5,175	4,244	6,051	8,096	6,355	\$6,307	\$5,353	1.06%
<b>Personnel Costs</b>	<b>\$484,090</b>	<b>\$535,222</b>	<b>\$489,350</b>	<b>\$631,505</b>	<b>\$656,427</b>	<b>\$595,882</b>	<b>\$545,964</b>	<b>\$616,525</b>	<b>\$678,523</b>	<b>\$582,610</b>	<b>3.47%</b>
2100 Books, Sub. & Memberships	783	2,738	1,112	2,062	887	1,372	2,760	3,400	\$3,400	\$2,057	36.95%
2300 Travel, Training & Meetings	4,934	3,481	3,673	2,876	6,257	5,830	8,981	7,875	\$7,875	\$5,754	8.77%
2400 Office Supplies			1,037	2,399	3,991	3,292	3,643	3,500	\$4,000	\$2,429	5.38%
2410 Copying	201	881	751	1,250	2,219	1,889	2,472	1,500	\$1,500	\$1,407	(5.15%)
2420 Postage	9,005	10,587	12,233	12,951	19,043	21,374	23,340	20,000	\$20,000	\$16,504	(1.61%)
2430 Publications			6,954						\$0	\$773	
2540 Mileage Reimbursement		236	143	151	224			400	\$400	\$173	
2800 Telephone	21,706	3,388	2,926	3,247	2,828	2,958	1,821	2,694	\$2,694	\$4,918	(2.23%)
2810 Telemetering	899	25,334	31,241	22,161	20,637	22,488	22,818	26,000	\$26,000	\$21,953	3.90%
4500 Special Dept. Supplies	5,180	2,478	3,216	3,901	3,794	5,931	716	6,500	\$6,500	\$4,246	2.40%
<b>Office Expense and Supplies</b>	<b>\$42,708</b>	<b>\$49,123</b>	<b>\$63,286</b>	<b>\$50,898</b>	<b>\$59,880</b>	<b>\$65,134</b>	<b>\$66,551</b>	<b>\$71,869</b>	<b>\$72,369</b>	<b>\$60,213</b>	<b>2.78%</b>
2600 Building O & M		2,073	8,061	8,309	7,695	7,772	8,161	7,500	\$7,500	\$6,341	(0.87%)
2610 Meter Repair	3,684	21,135	17,496	23,221	10,117	5,469	4,917	30,000	\$30,000	\$16,227	112.14%
2620 Well Maintenance	25,032	13,416	9,568	13,420	10,506	9,608	13,426	15,000	\$15,000	\$13,886	14.03%
2630 Line Maintenance	89,156	54,893	39,825	72,025	65,883	56,426	66,424	70,000	\$70,000	\$65,181	6.01%
<b>Facilities Supplies and Maintenance</b>	<b>\$117,872</b>	<b>\$91,517</b>	<b>\$74,960</b>	<b>\$116,875</b>	<b>\$94,201</b>	<b>\$79,275</b>	<b>\$94,928</b>	<b>\$122,500</b>	<b>\$122,500</b>	<b>\$101,636</b>	<b>13.83%</b>
2510 Fleet Rent	152,566	155,078	120,000	180,060	180,060	176,482	176,482	181,285	\$225,285	\$171,922	6.91%
2520 Vehicle Allowance	3,086	3,063	3,003	2,121	2,873	1,405	2,027	2,539	\$2,539	\$2,517	20.18%
<b>Transportation</b>	<b>\$155,652</b>	<b>\$158,141</b>	<b>\$123,003</b>	<b>\$182,181</b>	<b>\$182,933</b>	<b>\$177,887</b>	<b>\$178,509</b>	<b>\$183,824</b>	<b>\$227,824</b>	<b>\$174,439</b>	<b>7.02%</b>
2720 Heat	1,993	3,341	2,710	2,580	2,716	2,366	1,984	1,000	\$1,000	\$2,188	(14.43%)
2710 Power & Lights	578,226	637,031	709,913	870,621	1,037,857	796,007	533,146	1,130,000	\$780,000	\$785,867	(0.50%)
<b>Utilities</b>	<b>\$60,219</b>	<b>\$640,372</b>	<b>\$712,623</b>	<b>\$873,201</b>	<b>\$1,040,573</b>	<b>\$798,373</b>	<b>\$535,130</b>	<b>\$1,131,000</b>	<b>\$781,000</b>	<b>\$788,065</b>	<b>(0.54%)</b>
<b>Water Purchases (2730)</b>	<b>\$651,376</b>	<b>\$972,536</b>	<b>\$985,206</b>	<b>\$1,328,923</b>	<b>\$1,296,582</b>	<b>\$1,460,971</b>	<b>\$2,156,893</b>	<b>\$1,400,000</b>	<b>\$1,750,000</b>	<b>\$1,333,610</b>	<b>4.99%</b>
3300 Sample Testing	9,795	7,305	6,125	9,005	9,194	8,940	9,247	10,000	\$33,000	\$11,401	67.28%
3500 Computer Charges	11,751	18,957	11,953	15,016	15,016	10,318	10,318	10,318	\$10,318	\$12,663	
3100 Professional Services	17,820	18,341	6,561	26,456	17,971	23,232	17,797	7,000	\$7,000	\$15,798	(17.47%)
3400 Engineering Charges/Contract	51,917	51,322	71,200					25,000	\$25,000	\$24,938	
<b>Professional Services</b>	<b>\$81,283</b>	<b>\$95,925</b>	<b>\$95,839</b>	<b>\$50,477</b>	<b>\$42,181</b>	<b>\$42,490</b>	<b>\$37,362</b>	<b>\$52,318</b>	<b>\$75,318</b>	<b>\$64,799</b>	<b>19.32%</b>
5110 Off Duty Fleet Insurance					2,164	2,164	1,999	2,164	\$2,164	\$1,184	
5100 Insurance	16,000	32,500	37,500	37,500	40,336	40,336	43,836	47,000	\$56,855	\$39,096	10.24%
<b>Insurance</b>	<b>\$16,000</b>	<b>\$32,500</b>	<b>\$37,500</b>	<b>\$37,500</b>	<b>\$42,500</b>	<b>\$42,500</b>	<b>\$45,836</b>	<b>\$49,164</b>	<b>\$59,019</b>	<b>\$40,280</b>	<b>9.72%</b>
<b>Administrative Charges (3200)</b>	<b>\$420,706</b>	<b>\$443,496</b>	<b>\$502,306</b>	<b>\$402,878</b>	<b>\$423,020</b>	<b>\$427,221</b>	<b>\$527,097</b>	<b>\$527,097</b>	<b>\$527,097</b>	<b>\$486,769</b>	<b>5.84%</b>
<b>Uncollectible Accounts (5500)</b>	<b>\$1,324</b>	<b>\$1,210</b>	<b>\$11,300</b>	<b>\$6,577</b>	<b>\$7,523</b>	<b>\$7,649</b>	<b>\$7,662</b>	<b>\$1,500</b>	<b>\$1,500</b>	<b>\$5,138</b>	<b>(20.10%)</b>
<b>Sundry Charges (6100)</b>	<b>\$11,310</b>	<b>\$53,560</b>	<b>\$22,038</b>	<b>\$19,450</b>	<b>\$33,183</b>	<b>\$27,857</b>	<b>\$33,209</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$26,734</b>	<b>(7.05%)</b>
<b>Total Operating Expenses</b>	<b>\$2,582,540</b>	<b>\$3,073,602</b>	<b>\$3,117,401</b>	<b>\$3,700,665</b>	<b>\$3,879,003</b>	<b>\$3,725,239</b>	<b>\$4,229,140</b>	<b>\$4,175,797</b>	<b>\$4,315,150</b>	<b>\$3,644,282</b>	<b>3.98%</b>

**Table IV-2**  
**Sandy City Water Division**  
**Production and Cost Projections**

Water Source		FY1993	FY1994	FY1995	FY1996	FY1997
SLCWCD	Acre Feet	5,000	5,000	5,000	5,250	5,750
	Unit Cost	\$144.56	\$144.56	\$144.56	\$145.28	\$147.00
	Total Cost	\$722,800	\$722,800	\$722,800	\$762,720	\$845,250
MWDSLC						
Little Cottonwood Treatment	Acre Feet	5,500	6,000	6,250	6,500	6,750
	Unit Cost	\$60.00	\$65.00	\$70.00	\$75.00	\$75.00
	Total Cost	\$330,000	\$390,000	\$437,500	\$487,500	\$506,250
Little Cottonwood Well	Acre Feet	1,000	1,000	1,000	1,000	1,000
	Unit Cost	\$60.00	\$65.00	\$70.00	\$75.00	\$75.00
	Total Cost	\$60,000	\$65,000	\$70,000	\$75,000	\$75,000
Richards Ditch Well	Acre Feet	1,000	1,000	1,000	1,000	1,000
	Unit Cost	\$60.00	\$65.00	\$70.00	\$75.00	\$75.00
	Total Cost	\$60,000	\$65,000	\$70,000	\$75,000	\$75,000
Total Cost MWDSLC	Acre Feet	7500	8000	8250	8500	8750
	Average Cost	\$60.00	\$65.00	\$70.00	\$75.00	\$75.00
	Total Cost	\$450,000	\$520,000	\$577,500	\$637,500	\$656,250
Total Water Purchases						
	Acre Feet	12,500	13,000	13,250	13,750	14,500
	Average Cost	\$93.82	\$95.60	\$98.14	\$101.83	\$103.55
	Total Cost	\$1,172,800	\$1,242,800	\$1,300,300	\$1,400,220	\$1,501,500
Power Costs						
SLCWCD	Acre Feet	5,000	5,000	5,000	5,250	5,750
	Unit Cost	\$5.95	\$6.07	\$6.19	\$6.31	\$6.44
	Total Cost	\$29,750	\$30,345	\$30,952	\$33,149	\$37,033
MWDSLC						
Little Cottonwood Treatment	Acre Feet	5,500	6,000	6,250	6,500	6,750
	Unit Cost	\$13.80	\$14.08	\$14.36	\$14.64	\$14.94
	Total Cost	\$75,900	\$84,456	\$89,735	\$95,190	\$100,829
Little Cottonwood Well	Acre Feet	1,000	1,000	1,000	1,000	1,000
	Unit Cost	\$73.23	\$74.69	\$76.19	\$77.71	\$79.27
	Total Cost	\$73,230	\$74,695	\$76,188	\$77,712	\$79,267
Richards Ditch Well	Acre Feet	1,000	1,000	1,000	1,000	1,000
	Unit Cost	\$73.23	\$74.69	\$76.19	\$77.71	\$79.27
	Total Cost	\$73,230	\$74,695	\$76,188	\$77,712	\$79,267
Total Cost MWDSLC	Acre Feet	7,500	8,000	8,250	8,500	8,750
	Unit Cost	\$29.65	\$29.23	\$29.35	\$29.48	\$29.64
	Total Cost	\$222,360	\$233,845	\$242,111	\$250,615	\$259,362
Total Water Purchases						
	Acre Feet	12,500	13,000	13,250	13,750	14,500
	Average Cost	\$20.17	\$20.32	\$20.61	\$20.64	\$20.44
	Total Cost	\$252,110	\$264,190	\$273,063	\$283,764	\$296,394
Sandy City Well Productions						
	Acre Feet	10,252	10,458	10,940	11,198	11,234
	Unit Cost	\$73.23	\$74.69	\$76.19	\$77.71	\$79.27
	Total Cost	\$750,752	\$781,151	\$833,471	\$870,220	\$890,490
Total Power Cost						
	Acre Feet	22,752	23,458	24,190	24,948	25,734
	Average Cost	\$44.08	\$44.56	\$45.74	\$46.26	\$46.12
	Total Cost	\$1,002,862	\$1,045,341	\$1,106,534	\$1,153,984	\$1,186,884
Total Cost						
	Acre Feet	22,752	23,458	24,190	24,948	25,734
	Average Cost	\$95.63	\$97.54	\$99.50	\$102.38	\$104.47
	Total Cost	\$2,175,662	\$2,288,141	\$2,406,834	\$2,554,204	\$2,688,384

SLCWCD based upon minimum purchase agreement.

MWCSLC - Little Cottonwood Water is 5,000 Acre Feet (Sandy's estimated portion of Little Cottonwood Creek) plus Water under Resolution # 1633 (adjusted

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**Table IV-3  
Sandy City Water Division  
Anticipated Operating Expenses**

	<b>Escalation Rate (1)</b>	<b>FY1993</b>	<b>FY1994</b>	<b>FY1995</b>	<b>FY1996</b>	<b>FY1997</b>
<b>Personnel Costs</b>	3.5%	\$678,523	\$702,271	\$726,851	\$752,291	\$778,621
<b>Office Expense and Supplies</b>	2.8%	72,369	74,395	76,478	78,620	80,821
<b>Facilities Supplies and Maintenance</b>	5.0%	122,500	128,625	135,056	141,809	148,900
<b>Transportation</b>	7.0%	227,824	243,772	260,836	279,094	298,631
<b>Utilities</b>	Note 2	1,002,862	1,045,341	1,106,534	1,153,984	1,186,884
<b>Water Purchases</b>	Note 2	1,172,800	1,242,800	1,300,300	1,400,220	1,501,500
<b>Professional Services (Note 3)</b>	10.0%	300,318	330,350	363,385	399,723	439,696
<b>Insurance</b>	9.7%	59,019	64,744	71,024	77,913	85,471
<b>Administrative Charges</b>	5.8%	527,097	557,669	590,013	624,234	660,440
<b>Uncollectable Accounts</b>	2.0%	1,500	1,530	1,561	1,592	1,624
<b>Sundry Charges</b>	2.0%	20,000	20,400	20,808	21,224	21,649
<b>Total Operating Expenses</b>		<b>\$4,184,812</b>	<b>\$4,411,896</b>	<b>\$4,652,846</b>	<b>\$4,930,705</b>	<b>\$5,204,235</b>

Note 1: Escalation Rate Modified from Table IV-1

Note 2: See Table IV-2

Note 3: Base amount increased by \$225,000 for anticipated Safe Drinking Water Compliance

### **Capital Improvement Program**

The individual projects of the Capital Improvement Plan have be subdivided into depreciation categories and have been spread over the five year construction period. This is shown in Table IV-4.

Additionally, a facilities replacement program in the amount of the forecast depreciation on the Utility Plant in Service (less that portion associated with MWDSLCL) is anticipated.

**Table IV-4  
Sandy City Water Division  
Capital Improvements Program  
(1992 Dollars)**

	<b>FY1993</b>	<b>FY1994</b>	<b>FY1995</b>	<b>FY1996</b>	<b>FY1997</b>
<b>Land</b>	\$0	\$0	\$0	\$30,000	\$0
<b>Buildings</b>	\$132,000	\$0	\$0	\$132,000	\$0
<b>Water Rights</b>	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
<b>Wells</b>	\$0	\$0	\$0	\$652,000	\$0
<b>Pumps</b>	\$0	\$918,000	\$0	\$0	\$0
<b>Mains</b>	\$1,122,000	\$0	\$435,000	\$1,349,000	\$862,000
<b>Tanks</b>	\$0	\$1,407,000	\$1,476,000	\$0	\$0
<b>Total Improvements</b>	<b>\$1,554,000</b>	<b>\$2,625,000</b>	<b>\$2,211,000</b>	<b>\$2,463,000</b>	<b>\$1,162,000</b>
<b>Replacement (Depreciation - Table VI-2)</b>	<b>\$660,466</b>	<b>\$844,148</b>	<b>\$923,226</b>	<b>\$966,204</b>	<b>\$1,033,619</b>
<b>TOTAL Capital Improvement and Replacement</b>	<b>\$2,214,466</b>	<b>\$3,469,148</b>	<b>\$3,134,226</b>	<b>\$3,429,204</b>	<b>\$2,195,619</b>

Source: Sandy City Water System Master Plan, 1992

## **Chapter Five - PRICING POLICY**

Historically, the Sandy City Water Division has provided water to both "inside the city" and "outside the city" customers. Further, Sandy City has provided a discount for senior citizens using the water system. Additionally, Sandy City, by contract, provides water to "Union-Jordan" water system customers at a discount from other "outside the city" customers.

While the utility billing system maintains more categories, the current Sandy City rate structure does not distinguish between residential, multi-family, or commercial customers. This analysis assumes that the current practices will continue.

## **Chapter Six - OUTSIDE THE CITY REVENUE REQUIREMENTS**

This chapter develops the basis for revenue requirements for outside the city customers.

### **Utility Plant in Service**

The detailed utility plant in service as provided by the Sandy City Finance Department is shown in Table VI-1. The utility plant is categorized into various depreciation classifications. It also includes the year that the facility was put in service.

At the end of the list is the contributions-in-aid provided to Sandy City by subdividers and others. These are not counted as a part of the utility plant in service for the purposes of developing water rates.

### **Utility Plant in Service and Depreciation Expenses**

Table VI-2 summarizes the Utility Plant in Service in eleven categories. The summarized Utility Plant in Service is projected through FY1997 by adding the constructed plant from the *1992 Water System Master Plan and Capital Improvement Plan* and subtracting annual depreciation.

### **Projected Rate Base**

The projected rate base (Table VI-3) is calculated by taking the Utility Plant in Service and adding working capital for 45 days.

### **Revenue Requirements**

As recommended by the AWWA, the "utility basis" was used to calculate the revenue requirements for outside the city customers of the Water Division. The utility basis provides for allocations of costs of operation and maintenance, depreciation expenses, and a return on the utility rate base.

Depreciation expenses and return on the utility rate base were modified to proportionately reduce these categories to remove utility plant in service used for fire protection. Outside the city customers do not get fire protection services from the Sandy City Water Division.

The total was then prorated to reflect that 2.26% of the total water delivered by the

**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

PROJECT LOCATION	YEAR IN SERVICE	WATER RIGHTS/CAPACITY	WATER STOCK	LAND	ACCUM DEP SULPHUR	IMP OTHER THAN BLDGS	CCUM DEPR IMP	ACCUM DEPR MAINS	ACCUM DEPR MAINS	ACCUM DEPR WELLS	ACCUM DEPR WELLS	ACCUM DEPR TANKS	ACCUM DEPR TANKS	PUMPS	PUMPS	MACHINERY & EQUIP	CCUM DEPR M & E	ADJUSTMEN	WORK IN PROGRESS
1/3 INTEREST IN LITTLE COTTONWOOD CANYON	FY 1949			80 000															
FLAT IRON MESA WELL SITE	FY 1950			714															
FLAT IRON MESA PROPERTY	FY 1950			1 231															
GRANITE LITTLE CANYON WELL SITE	FY 1962			1 633															
GNARRIS & WEBB PROPERTY	FY 1965			100															
GRANITE TANK SITE	FY 1971			5 250															
STORAGE TANK SITE	FY 1974			11 784															
PHILLIPS WELL SITE	FY 1974			7 956															
ROBINSON WELL SITE	FY 1974			7 956															
WELL SITE 525 E 0990 B	FY 1974			7 956															
BEAVER POND ACREAGE	FY 1931			8 167															
BEAVER POND ACREAGE	FY 1974			7 956															
DESPAIN WELL SITE	FY 1974			3 928															
PEPPERWOOD TANK SITE	FY 1975			20 000															
HERBERT NELSON EASEMENT				25															
PROPERTY CARL OHMAN				313															
CITY HALL WELL HOUSE	FY 1953				37	36													
TRIPLE DIVIDE CHLORINATING PLANT	FY 1955				3 338	2 902													
FLAT IRON WELL HOUSE	FY 1959				4 078	3,321													
GREENWOOD WELL HOUSE	FY 1960				2 704	2 367													
GRANITE MESA WELL HOUSE	FY 1960				3 826	3 044													
BIG COTTONWOOD WELL HOUSE	FY 1961				586	431													
LITTLE COTTONWOOD WELL HOUSE	FY 1962				361	298													
COPPERVIEW WELL HOUSE	FY 1965				3 685	2 574													
1968 ADDITIONS	FY 1968				325	192													
SEVERSON WELL HOUSE	FY 1968				8 384	4 722													
CITY HALL REMODLING	FY 1969				4 470	2 514													
CITY HALL REMODLING FOUNDATION WORK	FY 1970				6,000	3 225													
IMPROVEMENTS TO FY 1978	FY 1978						1,788	1,788											
MAIN ADDITIONS 1948	FY 1948							102 500	102 500										
MAIN ADDITIONS 1949	FY 1949							1 240	1 240										
MAIN ADDITIONS 1950	FY 1950							2 835	2 835										
MAIN ADDITIONS 1951	FY 1951							4 779	4 779										
MAIN ADDITIONS 1952	FY 1952							2 004	2 004										
MAIN ADDITIONS 1953	FY 1953							7 180	7 180										
MAIN ADDITIONS 1954	FY 1954							23 811	23 811										
MAIN ADDITIONS 1955	FY 1955							16 573	16 573										
MAIN ADDITIONS 1957	FY 1957							12 511	12 511										
MAIN ADDITIONS 1958	FY 1958							88 483	88 483										
MAIN ADDITIONS 1959	FY 1959							121 024	121 024										
MAIN ADDITIONS 1960	FY 1960							76,084	76 811										
MAIN ADDITIONS 1961	FY 1961							68,979	65 843										
MAIN ADDITIONS 1962	FY 1962							8 217	7 595										
MAIN ADDITIONS 1963	FY 1963							14 633	13 081										
MAIN ADDITIONS 1964	FY 1964							36 783	31 778										
MAIN ADDITIONS 1965	FY 1965							27 471	22 883										
MAIN ADDITIONS 1966	FY 1966							88 456	71 836										
MAIN ADDITIONS 1967	FY 1967							34 234	26 454										
MAIN ADDITIONS 1969	FY 1969							48 060	36,423										
MAIN ADDITIONS 1969	FY 1969							83,998	59 817										
MAIN ADDITIONS 1970	FY 1970							22 842	15 842										
MAIN ADDITIONS 1971	FY 1971							368,202	268,132										
MAIN ADDITIONS 1972	FY 1972							488,324	290 828										
MAIN ADDITIONS 1973	FY 1973							444 805	282 721										
MAIN ADDITIONS 1974	FY 1974							2 018 288	132 014										
MAIN ADDITIONS 1975	FY 1975							387 030	184 637										
MAIN ADDITIONS 1976	FY 1976							308 399	164 700										
MAIN ADDITIONS 1977	FY 1977							6,188	2 887										
MAIN RETIREMENTS 1985	FY 1985							(50 000)	(25 000)										
MAIN RETIREMENTS 1989	FY 1989							(110 000)	(51 000)										
WELL ADDITIONS 1963	FY 1963									15 883	15 883								
WELL ADDITIONS 1964	FY 1964									80	80								
WELL ADDITIONS 1968	FY 1968									10 014	10 014								
WELL ADDITIONS 1969	FY 1969									26,748	26,748								
WELL ADDITIONS 1982	FY 1982									1 702	1 702								
WELL ADDITIONS 1983	FY 1983									4 844	4 844								
WELL ADDITIONS 1984	FY 1984									14 882	14 882								
WELL ADDITIONS 1985	FY 1985									45	45								

**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

WELL ADDITIONS 1967	FY 1967			348	348				
WELL ADDITIONS 1968	FY 1968			48,875	47,055				
WELL ADDITIONS 1969	FY 1969			58,334	54,074				
WELL ADDITIONS 1970	FY 1970			1,000	1,483				
WELL ADDITIONS 1971	FY 1971			28,880	24,553				
WELL ADDITIONS 1972	FY 1972			18,280	15,803				
WELL ADDITIONS 1973	FY 1973			2,722	2,087				
WELL ADDITIONS 1974	FY 1974			37,286	27,243				
WELL ADDITIONS 1975	FY 1975			33,784	23,507				
WELL ADDITIONS 1976	FY 1976			79,847	52,785				
WELL ADDITIONS 1977	FY 1977			107	88				
TANK ADDITIONS 1948	FY 1948					30,784	30,784		
TANK ADDITIONS 1958	FY 1958					5,388	5,388		
TANK ADDITIONS 1959	FY 1959					5,538	5,538		
TANK ADDITIONS 1961	FY 1961					3,031	3,031		
TANK ADDITIONS 1966	FY 1966					3,403	3,335		
TANK ADDITIONS 1970	FY 1970					98,500	88,650		
TANK ADDITIONS 1971	FY 1971					197,456	118,212		
TANK ADDITIONS 1974	FY 1974					267,008	198,028		
TANK ADDITIONS 1975	FY 1975					2,500	1,750		
TANK ADDITIONS 1976	FY 1976					7,875	5,188		
TANK RETIREMENTS 1990	FY 1990					(37,058)	(24,458)		
PUMP ADDITIONS 1953	FY 1953							8,335	8,335
PUMP ADDITIONS 1954	FY 1954							380	380
PUMP ADDITIONS 1955	FY 1955							5,388	5,388
PUMP ADDITIONS 1960	FY 1960							1,522	1,522
PUMP ADDITIONS 1961	FY 1961							50	50
PUMP ADDITIONS 1963	FY 1963							4,854	4,854
PUMP ADDITIONS 1965	FY 1965							28	28
PUMP ADDITIONS 1966	FY 1966							28,300	28,300
PUMP ADDITIONS 1967	FY 1967							1,258	1,258
PUMP ADDITIONS 1968	FY 1968							787	787
PUMP ADDITIONS 1971	FY 1971							1,751	1,751
PUMP ADDITIONS 1975	FY 1975							14,308	14,308
PUMP ADDITIONS 1976	FY 1976							5,313	5,313
WATER METERS	FY 1977			85,170	40,474				
WATER METERS	FY 1978			88,482	30,530				
WATER METERS	FY 1979			111,827	45,885				
WATER METERS	FY 1980			58,554	22,178				
WATER METERS	FY 1981			4,380	1,525				
WATER METERS	FY 1982			83,038	28,803				
WATER METERS	FY 1983			14,238	4,099				
WATER METERS	FY 1984			18,813	5,103				
WATER METERS	FY 1985			16,981	3,882				
WATER METERS	FY 1986			9,371	1,846				
WATER METERS	FY 1987			18,276	3,213				
WATER METERS	FY 1988			27,464	3,745				
WATER METERS	FY 1989			25,181	2,672				
WATER METERS	FY 1990			14,588	1,105				
WATER METERS	FY 1991			8,375	425				
WATER STOCK PRIOR TO 1978	THRU 1977		243,814						
PURCHASE OF WATER STOCK	FY 1978		281						
PURCHASE OF WATER STOCK	FY 1979		3,323	51	21				
PURCHASE OF WATER STOCK	FY 1980		1,330						
PURCHASE OF WATER STOCK	FY 1981		4,098						
PURCHASE OF WATER STOCK	FY 1983		14,080						
PURCHASE OF WATER STOCK	FY 1984		2,845						
PURCHASE OF WATER STOCK	FY 1985		54,200						
PURCHASE OF WATER STOCK	FY 1986		22,055						
PURCHASE OF WATER STOCK	FY 1987		31,367						
PURCHASE OF WATER STOCK	FY 1988		18,995						
PURCHASE OF WATER STOCK	FY 1989		3,290						
PURCHASE OF WATER STOCK	FY 1990		8,050						
PURCHASE OF WATER STOCK	FY 1991	82,840	225,595						
PURCHASE OF WATER STOCK	FY 1992	310,487	78,737						
PIPE OVERAGE	FY 1977			100,000	1,515				
PIPE OVERAGE	FY 1978			53,488	25,124				
PIPE OVERAGE	FY 1979			117,314	51,547				
PIPE OVERAGE	FY 1980			133,056	54,432				
PIPE OVERAGE	FY 1981			103,401	38,187				
PIPE OVERAGE	FY 1981			8,031	2,798				

**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

PIPE OVERAGE	FY 1982					14,084	4,481						
PIPE OVERAGE	FY 1983					8,280	2,378						
PIPE OVERAGE	FY 1984					879	175						
PIPE OVERAGE	FY 1985					10,822	2,480						
PIPE OVERAGE	FY 1986					21,480	4,227						
PIPE OVERAGE	FY 1987					46,820	7,837						
PIPE OVERAGE	FY 1988					23,500	3,205						
PIPE OVERAGE	FY 1989					10,415	1,105						
PIPE OVERAGE	FY 1990					20,929	1,588						
PIPE OVERAGE	FY 1991					28,772	1,308						
PIPE OVERAGE	FY 1992					71,137	1,078						
INDUSTRIAL DEVELOPMENT	FY 1981					7,980	2,774						
INDUSTRIAL DEVELOPMENT	FY 1983					2,581	743						
INDUSTRIAL DEVELOPMENT	FY 1986					8,204	1,410						
7TH EAST MAIN	FY 1977					287,404	138,890						
7TH EAST MAIN	FY 1978					7,902	3,472						
18" MAIN 7TH EAST	FY 1980					38,183	14,842						
MAIN LINE PHILLIPS TO HAND	FY 1980					32,415	12,279						
CANYON VILLAGE WELL	FY 1983	21,888	8,888	788	358	18,318	5,273	125,180	47,588		88,438	88,438	
OLD MISSION ROAD	FY 1978					2,846	1,251						
TIE IN OLD MISSION ROAD	FY 1979					2,780	1,128						
COPPERVIEW WELL OVERHAUL	FY 1978									1,877	1,147		
LITTLE CANYON WELL	FY 1977									3,385	2,087		
BIG CANYON WELL	FY 1977									4,024	2,495		
BIG CANYON WELL	FY 1978									1,850	1,131		
HAUN WELL	FY 1977	4,000	22,083	8,528						82,272	51,008		
HAUN WELL	FY 1978		1,185	481						531	308		
HAUN WELL	FY 1979	1,088											
PALMER/ROBINS WELL	FY 1979		42,000	14,176				177,280	95,721		88,000	88,000	
PALMER/ROBINS WELL	FY 1980							810	405				
TIE IN 8TH SOUTH 7TH EAST	FY 1980					575	218						
18" MAIN STATE STREET	FY 1980					95,888	38,237						
TELEMETERING	FY 1979					50,148	20,516						
TELEMETERING	FY 1980					43,140	18,341						
TELEMETERING	FY 1982					17,484	5,586						
TELEMETERING	FY 1983					28,783	8,577						
TELEMETERING	FY 1984					18,388	4,988						
TELEMETERING	FY 1985					30,825	7,008						
TELEMETERING	FY 1986												
TELEMETERING	FY 1987										27,586	22,421	
TELEMETERING	FY 1988										14,828	10,184	
TELEMETERING	FY 1989										7,008	3,842	
TELEMETERING	FY 1990										2,580	1,133	
TELEMETERING	FY 1991										18,730	3,353	
LANDSCAPING	FY 1981				11,844	7,243		2,488	112				
LANDSCAPING	FY 1982				838	440							
LANDSCAPING	FY 1983				18,580	8,818							
LANDSCAPING	FY 1984				7,003	2,878							
LANDSCAPING	FY 1985				48,115	18,043							
LANDSCAPING	FY 1986				1,028	330							
LANDSCAPING	FY 1987				3,217	885							
LANDSCAPING	FY 1988				12,801	2,835							
LANDSCAPING	FY 1989				1,821	318							
LANDSCAPING	FY 1990				2,385	286							
LANDSCAPING	FY 1991				1,580	117							
LANDSCAPING	FY 1992				73,810	1,848							
S.E. WATER TANK	FY 1985									1,878,448	383,535		
S E. WATER TANK	FY 1988									2,048	831		
WELL SITE	FY 1980	23,874											
GRANITE MESA BOOSTER	FY 1980												
WILLOW WICK WELL SITE	FY 1980	25,858										38,884	38,884
CROWTON SPRINGS	FY 1985	180,088	15,500	2,988	18,080	8,780	7,841	1,737	17,428	5,228	15,800	14,825	
BEVERSON WELL	FY 1978	9,000							72,874	42,287			
BEVERSON WELL	FY 1980		32,088	10,022			30,412	11,520			48,704	48,704	
HAND RESERVOIR	FY 1978	72,087											
HAND RESERVOIR	FY 1980										828,878	413,305	
GREENWOOD WELL	FY 1981												
MAIN STREET PIPING	FY 1981						34,185	11,813			11,807	11,807	
GLACIO PARK -1981	FY 1980												8,880
GLACIO PARK -1982	FY 1980												27,504



**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

GLACIO PARK 1983	FY 1990																		24,886
GLACIO PARK 1984	FY 1990																		52,708
GLACIO PARK 1985	FY 1990																		88,901
GLACIO PARK 1986	FY 1990																		38,003
GLACIO PARK 1987	FY 1990																		91,057
GLACIO PARK 1988	FY 1990																		51,232
GLACIO PARK 1989	FY 1990																		29,208
GLACIO PARK 1990	FY 1990																		29,484
GLACIO PARK 1991	FY 1991							22,932	1,042										
GLACIO PARK 1992	FY 1992							(22,932)											
CEMETERY WELL METERING	FY 1991							3,558	1,240										55,882
CEMETERY WELL	FY 1992																		
RESERVOIR TO 2700 E LINE	NOT IN SERVICE																		
PALMER/ROBINS TRANS LINE	FY 1979							73,779	30,182										13,888
MAIN LINE PALMER TO FLAT IRON	FY 1990							131,514	48,616										
BICENTENNIAL BUILDING	FY 1992																		
GRANITE MESA TANK	FY 1979																		
GRANITE MESA TANK	FY 1990																		
METER STATIONS	FY 1992							16,362	5,203										
METER STATIONS	FY 1994							74,285	18,129										
EQUIP FLAT IRON WELL #2	FY 1995																		
MASTER PLAN UPDATE	FY 1987							16,001	2,867	16,891	3,528	16,891	3,528						
METRO FEASIBILITY STUDY	FY 1995							12,107	2,752										
TREATMENT PLANT STUDY	FY 1990							15,130	5,731										
WATER STUDY	FY 1990							8,070	1,820										
WATER FACILITY PURCHASE	FY 1994	170,000	221,000	48,953	34,000	14,450													
TRANS TELEPHONE SYS WATER FACILITY	FY 1995																		
PARTIAL SALE OF WATER FACILITY	FY 1991	(108,800)	(234,524)	(31,902)	(21,760)	(7,079)													15,190
PARTIAL SALE OF WATER FACILITY	FY 1992	(51,000)	(108,933)	(14,954)	(10,200)	(3,318)													
WILLOW CREEK PARK MAIN LINE	FY 1995							18,201	4,137										
10000 SOUTH MAIN LINE	FY 1995							152	34										
DRILL WILDFLOWER WELL & MAIN	FY 1995																		
DRILL WILDFLOWER WELL & MAIN	FY 1998	34,000	5,525					47,810	9,417	173,518	52,055								
DRILL WILDFLOWER WELL & MAIN	FY 1997							18,946	3,158										
DRILL NEW WELL WALLIN/BICENTENNIAL	FY 1995									138,081	41,418								
EQUIP BICENTENNIAL/WALLIN WELL	FY 1998	34,824	5,059					19,298	3,801										
EQUIP BICENTENNIAL/WALLIN WELL	FY 1987																		
WALLIN WELL FLUSH OUT LINE	FY 1987									84,634	14,283								
WALLIN WELL CHLORINE STATION	FY 1991																		
PRESSURE REGULATING STATIONS	FY 1977							138	65										
PRESSURE REGULATING STATIONS	FY 1979							10,381	4,238										
PRESSURE REGULATING STATIONS	FY 1987							21,872	3,812										
PRESSURE REGULATING STATIONS	FY 1991							54,459	2,475										
BOOSTER #1	FY 1977	67,791	26,288																
BOOSTER #1	FY 1978																		
BOOSTER #1	FY 1979																		
BOOSTER #2	FY 1977	22,719	8,804																
BOOSTER #2	FY 1978																		
BOOSTER #2	FY 1979																		
FLAT IRON WELL	FY 1979									90,424	48,829								
PROWSWOOD PIPING	FY 1979							82,783	25,888										
PROWSWOOD WELL	FY 1991																		
PROWSWOOD WELL	FY 1992							11,481	4,001	61,475	28,279								
DIXIE SIX WELL	FY 1979	15,000																	
MELVILLE WELL	FY 1979	6,188								10,878	5,874								
MELVILLE WELL	FY 1986									7,000	3,780								
SOUTHBRIDGE	FY 1994									75	23								
DRILL NEW WELL-HILLSHIRE WELL	NOT IN SERVICE							35,000	9,015										
HILLSHIRE WELL	NOT IN SERVICE																		175
HILLSHIRE WELL	NOT IN SERVICE																		138,872
HILLSHIRE WELL	NOT IN SERVICE																		1,886
HILLSHIRE WELL	NOT IN SERVICE																		18,874
HILLSHIRE WELL	NOT IN SERVICE																		2,018
HILLSHIRE WELL	NOT IN SERVICE																		1,808
HILLSHIRE WELL	NOT IN SERVICE																		13,190
STORAGE TANK ZONE 5	FY 1991																		
STORAGE TANK ZONE 5	FY 1991	780																	
STORAGE TANK	FY 1991																		
STORAGE TANK	FY 1991							88,000	4,465										
STORAGE TANK	NOT IN SERVICE																		14,848
WELL REHABILITATION	FY 1978									4,112	2,385								

**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

WELL REHABILITATION	FY 1987			58,179	13,019		
WELL REHABILITATION	FY 1988			1,700	308		
WELL REHABILITATION	FY 1989			32,881	4,805		
WELL REHABILITATION	FY 1990			32,767	3,277		
WELL REHABILITATION	FY 1991					3,118	888
WELL REHABILITATION	FY 1992					18,394	888
METRO WELL REHAB/PURCHASE	FY 1990			300	23		
16" MAIN-90TH S. HRRSN SNDYB	FY 1987			150,191	26,032		
FOXBRIDGE TO MIDSHORE MANOR	FY 1978			1,124	484		
CARMEL COVE	FY 1978			128	56		
ENCHANTED VILLAGE	FY 1977			100	47		
KEBLER TIE IN	FY 1977			5,519	2,592		
6" MAIN LINE 8TH SOUTH	FY 1977			4,444	2,088		
84TH SOUTH STATE	FY 1977			409	192		
8HOP WATER LINE	FY 1978			41,410	18,195		
13TH EAST LINE	FY 1977			482,784	217,388		
13TH EAST LINE	FY 1978			82,581	27,498		
4" LINE 8TH SOUTH 4TH EAST	FY 1978			381	172		
PIONEER STREET LINE	FY 1977			16,022	7,528		
PIONEER STREET LINE	FY 1978			1,847	724		
114TH SOUTH LINE	FY 1977			118,840	54,785		
114TH SOUTH LINE	FY 1978			1,118	481		
18T NORTH MAIN LINE	FY 1978			84,205	28,288		
2ND SOUTH TRANS. LINE	FY 1978			102,853	42,080		
CENTER STREET MAIN LINE	FY 1978			18,125	7,086		
MAIN LINE-CENTER STREET	FY 1978			12,311	5,038		
8800 SOUTH-LINE MAINTENANCE	FY 1982			23,581	7,487		
12" MAIN-NEWCASTLE & 8800 S.	FY 1983			35,837	10,317		
GRANITE MESA TO FLAT IRON LINE	FY 1983			98,105	28,280		
STATE ST. -8300 S. TO 7200 S.	FY 1983			12,408	3,572		
TELEMETERING-LITTLE COTTONWOOD	FY 1983			19,485	5,904		
VISCONTI MAIN LINE-EXTENSION	FY 1983			7,953	2,280		
8" MAIN 114TH S./STATE TO 115	FY 1988			8,591	1,882		
CONSERVANCY CONNECTIONS	FY 1978			2,845	1,284		
PEPPERWOOD BOOSTER	FY 1977					4,879	4,879
PEPPERWOOD LINE	FY 1977			81,040	42,781		
PEPPERWOOD LINE	FY 1978			1,814	708		
PEPPERWOOD TANK	FY 1978					318,583	183,519
PEPPERWOOD TANK	FY 1978					4,888	2,531
REPAIR PEPPERWOOD TANK	FY 1983					118,329	44,905
PEPPERWOOD METER STATION	FY 1987			3,838	840		
WATER FACILITY REMODELING	FY 1988	128,297	20,848				
WATER FACILITY REMODELING	FY 1987	3,561	480				
WATER FACILITY REMODELING	FY 1988	3,444	387				
STATE STREET PPE LINE	FY 1987			41,232	8,872		
PRV STATION 114TH S. 13TH E.	FY 1978			733	322		
PRV STATION 8200 S. 1300 E.	FY 1991			285	12		
PURCHASE & DRILL WELL/ALTA COVE	FY 1988	25,848					
DRILL NEW WELL/PURCHASE SITE	NOT IN SERVICE						279
DRILL NEW WELL/PURCHASE SITE	NOT IN SERVICE						88,891
WATER TREATMENT PLANT	FY 1988		301,855				
WATER TREATMENT PLANT	FY 1990	25,882					
WATER TREATMENT PLANT	FY 1990	24,473	150				
WATER TREATMENT PLANT	FY 1990	123,831					
WATER TREATMENT PLANT	FY 1991			57	3		
RELOCATE PRV 114TH S.	FY 1987			8,433	1,405		
WATER LINE CROSSING 10200 S.	FY 1990			534	40		
WATER LINE 10300 S. STATE ST.	FY 1990			15,837	1,185		
WHITE CITY CONNECTION	FY 1987			3,724	821		
10800 S. STATE ST.	FY 1988			9,585	811		
MOCKING BIRD LANE TIE IN	FY 1988			2,258	308		
MOCKING BIRD LANE TIE IN	FY 1988			50	5		
GRANITE MESA IRRIG.	NOT IN SERVICE						584
GRANITE MESA IRRIG.	NOT IN SERVICE						8,085
GRANITE MESA IRRIG.	NOT IN SERVICE						13,205
STORAGE BUILDING	FY 1988		808	79			
METER READING DEVICES	FY 1991			17,875	813		
HIGH BENCH PRESSURE ZONE SYSTEM	FY 1992	3,280					
POWER FACTOR EQUIPMENT	FY 1992					5,981	822
POWER FACTOR EQUIPMENT	FY 1992					5,919	589

**UTILITY PLANT IN SERVICE**  
**Fiscal Year Ending 30 Jun 92**

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**Table VI-1  
Water Fund  
UTILITY PLANT IN SERVICE  
Fiscal Year Ending 30 Jun 92**

REPLACE LOWER SERVICE LINES	FY 1987								5,402	900												
REPLACE LOWER SERVICE LINES	FY 1988								10,408	1,419												
REPLACE LOWER SERVICE LINES	FY 1989								13,586	1,440												
REPLACE LOWER SERVICE LINES	FY 1990								9,841	746												
REPLACE LOWER SERVICE LINES	FY 1991								28,072	1,195												
REPLACE LOWER SERVICE LINES	FY 1992								17,435	264												
REPLACE WELL EQUIPMENT	FY 1979										5,383	2,888										
REPLACE WELL EQUIPMENT	FY 1983															72,447	72,447					
REPLACE WELL EQUIPMENT	FY 1984															30,308	30,308					
REPLACE WELL EQUIPMENT	FY 1985															35,084	33,047					
REPLACE WELL EQUIPMENT	FY 1986															2,828	2,378					
REPLACE WELL EQUIPMENT	FY 1987															31,415	21,588					
REPLACE WELL EQUIPMENT	FY 1988															48,328	27,748					
REPLACE WELL EQUIPMENT	FY 1989															31,343	13,713					
REPLACE WELL EQUIPMENT	FY 1990										29,873	2,887										
REPLACE WELL EQUIPMENT	FY 1991															52,128	9,574					
REPLACE WELL EQUIPMENT	FY 1992															2,786	173					
8"MAIN-CENTER ST. TO STATE ST.	FY 1984								14,822	3,788												
8"MAIN-18T N.CENTER TO STATE	FY 1984								17,378	4,478												
8"MAIN-150 W.10400 S.TO 9250 S.	FY 1985								12,425	2,824												
FLAT IRON TANK PAINTING	FY 1984												80,844	58,818								
REBUILD FLAT IRON WELL #1	FY 1985															2,508	2,348					
8"MAIN-PIONEER AVENUE	FY 1985								25,178	5,722												
90TH SOUTH-MAIN LINE	FY 1985								5,513	1,253												
DRAPER REPLACEMENT	FY 1985								388	80												
12"MAIN-700 E.8800 S.TO 7200 S	FY 1983								181,833	52,375												
8"MAIN-200 E. MAIN TO 700 S.	FY 1983								18,445	5,310												
8"MAIN-LOCUST 10TH TO 13TH E.	FY 1985								20,138	4,577												
10"MAIN-8000 SOUTH	FY 1985								3,122	710												
90TH SOUTH-150 E. TO 1050 E.	FY 1985								321,348	73,033												
RESERVOIR METERS	FY 1977															11,583	11,583					
REPLACE LARGE METERS	FY 1985								14,421	3,278												
REPLACE LARGE METERS	FY 1988								10,727	2,113												
REPLACE LARGE METERS	FY 1987								12,388	2,081												
REPLACE LARGE METERS	FY 1988								2,477	338												
REPLACE LARGE METERS	FY 1989								7,720	818												
REPLACE METERS	FY 1991								17,588	800												
REPLACE METERS	FY 1992								8,135	93												
DAVIDSON WELL	FY 1988										71,888	18,884										
MISC. WATER PROJECTS	FY 1985								12,356	2,808												
WATER BUILDING REMODELING	FY 1985			16,142	1,988																	
P/W BUILDING REMODELING	FY 1988			8,888	817																	
UNION JORDAN EVALUATION	FY 1985								2,420	550												
18"MAIN-500 WEST	FY 1985								22,051	5,012												
8"MAIN 8MART LINE	FY 1988								6,746	1,328												
500 W.-18" LINE	FY 1988								2,488	337												
8"MAIN 200 E. CHARITY LANE	FY 1988								2,842	578												
12"MAIN-110TH S.300 E.TO STATE	FY 1987								48,772	8,129												
8"MAIN-3050 E. 9400 S.	FY 1987								3,724	621												
CROWTON LINE TIE IN WELL	FY 1988								978	133												
PARKING LOT @ WATER SHOP	FY 1987					41	11															
800 S. TRACK STREET	FY 1991								180,148	8,188												
300 W. FREEWAY CROSSING	NOT IN SERVICE																			28		
300 W. FREEWAY CROSSING	NOT IN SERVICE																			1,788		
MAIN LINE 3100 E. 98TH S.	FY 1990								27,883	1,783												
METER CHANGE OUT	FY 1988								81,474	12,474												
METER CHANGE OUT	FY 1988								23,718	2,516												
METER CHANGE OUT	FY 1990								20,546	1,556												
METER CHANGE OUT	FY 1991								9,114	414												
METER CHANGE OUT	FY 1992								25,824	388												
TOTALS				9,888,888	711,758	800,324	780,133	167,950	207,913	58,401	12,788,377	5,053,480	2,077,512	892,581	5,977,383	1,820,888	1,871,983	1,035,884	15,188	0	748,658	883,870
A-1 SYSTEM	FY 1990					30,000	11,448	718			433,088	32,808			218,191	21,818	103,150	32,234				
SUB TOTAL				0	0	30,000	11,448	718	0	0	433,088	32,808	0	0	218,191	21,818	103,150	32,234	0	0	0	0
CONTRIBUTIONS IN AID	FY 1978										328,795	184,888										
CONTRIBUTIONS IN AID	FY 1977										718,510	338,543										
CONTRIBUTIONS IN AID	FY 1978										487,778	214,327										

**Table VI-1**  
**Water Fund**  
**UTILITY PLANT IN SERVICE**  
**Fiscal Year Ending 30 Jun 92**

CONTRIBUTIONS IN AID	FY 1979	680,006	278,188																	
CONTRIBUTIONS IN AID	FY 1980	1,367,153	514,073																	
CONTRIBUTIONS IN AID	FY 1981	707,430	246,529																	
CONTRIBUTIONS IN AID	FY 1982	1,220,328	388,286																	
CONTRIBUTIONS IN AID	FY 1983	621,505	170,105																	
CONTRIBUTIONS IN AID	FY 1984	73,720	18,988																	
CONTRIBUTIONS IN AID	FY 1985	442,400	100,545																	
CONTRIBUTIONS IN AID	FY 1986	749,498	147,622																	
CONTRIBUTIONS IN AID	FY 1987	521,807	86,935																	
CONTRIBUTIONS IN AID	FY 1988	488,545	87,883																	
CONTRIBUTIONS IN AID	FY 1989	282,337	29,946																	
CONTRIBUTIONS IN AID	FY 1990	486,288	35,248																	
CONTRIBUTIONS IN AID	FY 1991	571,612	25,982																	
CONTRIBUTIONS IN AID	FY 1992	425	438,183	8,538																
GRAND TOTAL		8,066,888	712,183	830,324	791,579	188,086	207,813	58,401	23,385,120	7,818,134	2,077,512	882,581	8,228,574	1,857,187	1,379,613	1,578,888	16,188	0	748,888	883,678

**Table VI-2**  
**Sandy City Water Division**  
**Utility Plant In Service and Depreciation Expenses**  
As of 30 Jun 1992

	Useful Life (Years)	Cumulative		FY1992			FY1994			FY1996			FY1998			FY1997		
		Original Cost	Depreciation	Balance	Additions	Depreciation	Balance	Additions	Depreciation	Balance	Additions	Depreciation	Balance	Additions	Depreciation	Balance	Additions	Depreciation
Water Rights/Capact	-	\$9,668,898	\$0	\$9,668,898	\$0	\$0	\$9,668,898	\$0	\$0	\$9,668,898	\$0	\$0	\$9,668,898	\$0	\$0	\$9,668,898	\$0	\$0
Water Stock	-	\$711,758	\$0	\$711,758	\$0	\$0	\$711,758	\$0	\$0	\$711,758	\$0	\$0	\$711,758	\$0	\$0	\$711,758	\$0	\$0
Land	-	\$800,324	\$0	\$800,324	\$0	\$0	\$800,324	\$0	\$0	\$800,324	\$0	\$0	\$800,324	\$30,000	\$0	\$830,324	\$0	\$0
Buildings	20	\$780,133	\$167,950	\$612,183	\$132,000	\$30,809	\$713,574	\$0	\$35,878	\$677,896	\$0	\$33,896	\$644,000	\$132,000	\$32,200	\$743,800	\$0	\$37,180
Other Improvements	30	\$207,913	\$58,401	\$149,512	\$300,000	\$4,984	\$444,528	\$300,000	\$14,818	\$728,711	\$300,000	\$24,324	\$1,006,387	\$300,000	\$33,513	\$1,271,874	\$300,000	\$42,398
Mains	40	\$12,788,377	\$5,053,480	\$7,714,897	\$1,122,000	\$196,872	\$8,800,025	\$0	\$220,001	\$8,580,024	\$436,000	\$214,501	\$8,800,523	\$1,348,000	\$220,013	\$9,828,510	\$862,000	\$248,238
Wells	20	\$2,077,512	\$892,581	\$1,184,931	\$0	\$78,247	\$1,505,886	\$0	\$75,284	\$1,430,400	\$0	\$71,520	\$1,358,880	\$852,000	\$87,844	\$1,942,938	\$0	\$97,147
Tanks	40	\$6,977,383	\$1,820,868	\$4,156,515	\$0	\$103,913	\$4,052,802	\$1,407,000	\$101,315	\$5,358,287	\$1,476,000	\$133,967	\$6,700,330	\$0	\$187,508	\$6,532,822	\$0	\$183,321
Pumps	20	\$1,271,963	\$1,035,894	\$236,069	\$0	\$11,803	\$224,266	\$918,000	\$11,213	\$1,131,053	\$0	\$58,553	\$1,074,500	\$0	\$53,725	\$1,020,775	\$0	\$51,038
Machinery & Equipm	5	\$15,180	\$0	\$15,180	\$0	\$3,038	\$12,152	\$0	\$2,430	\$9,722	\$0	\$1,944	\$7,777	\$0	\$1,566	\$6,222	\$0	\$1,244
MWD&LC (1)	-			\$17,542,518	\$2,789,915	\$230,000	\$20,082,433	\$87,500	\$383,408	\$18,788,825	\$87,750	\$386,533	\$18,487,742	\$81,000	\$388,748	\$18,188,997	\$82,750	\$393,045
Utility Plant In Service		\$34,278,452	\$9,028,174	\$42,782,788	\$4,323,915	\$680,488	\$47,018,245	\$2,712,500	\$844,148	\$48,884,597	\$2,298,750	\$823,226	\$50,280,121	\$2,554,000	\$868,204	\$51,947,917	\$1,254,750	\$1,033,618

(1) Sandy Portion of Metropolitan Water District of Salt Lake City (S Dec 90 Memorandum)  
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**Table VI-3  
Sandy City Water Division  
Projected Rate Base**

	<b>FY1993</b>	<b>FY1994</b>	<b>FY1995</b>	<b>FY1996</b>	<b>FY1997</b>
Net Value of Utility Plant (1)	\$47,016,245	\$48,884,597	\$50,260,121	\$51,847,917	\$52,069,048
Working Capital (2)	\$523,102	\$523,102	\$551,487	\$581,606	\$616,338
Rate Base	\$47,539,346	\$49,407,698	\$50,811,608	\$52,429,523	\$52,685,386

(1) Table VI-2

(2) Working Capital assumes that payments lag about 45 days.; see Table IV-3.

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Water Division was for outside the city customers. See Table IV-4, Revenue Requirements.



**Table VI-4  
Sandy City Water Division  
Revenue Requirements**

	Table	FY1993	FY1994	FY1995	FY1996	FY1997
Operations and Maintenance	IV-3	\$4,184,812	\$4,411,896	\$4,652,846	\$4,930,705	\$5,204,235
Modified Depreciation Expense	VI-2	\$544,124	\$721,232	\$783,494	\$820,538	\$870,871
Modified Return on Rate Base	VI-3	\$4,769,134	\$4,926,925	\$5,049,899	\$5,173,504	\$5,191,105
Revenue Requirement		\$9,498,070	\$10,060,053	\$10,486,239	\$10,924,746	\$11,266,211

County Classification (Table II-3)    2.26% of Customers

County Revenue	\$214,301	\$226,981	\$236,597	\$246,491	\$254,195
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Modifications reduce revenue requirements for deletion of "Fire Protection" category.

Return on Rate Base                      11.00%

## **Chapter Seven - COST ALLOCATION AND RATES**

Each water system incurs cost while serving a variety of needs. This chapter develops the allocation of costs to the various functions of the water system as well as the rates that are a consequence of that allocation.

### **Allocation of Operating and Maintenance Costs**

An allocation of operating and maintenance costs is made to the five service categories. The result in Table VII-1 is the dollar weighted percentage of operating and maintenance costs allocated to each of the five categories.

### **Allocation of Revenue Requirements**

Based upon the relative allocation of operating and maintenance costs, the estimated FY1993 O&M budget is allocated to the various categories. Modified depreciation expenses and modified rate of return are also allocated to the various categories for reasons discussed in Chapter Six.

Note that the depreciation costs come from Table VI-2 and the rate of return on Utility Plant are modified (reduced) to reflect that a portion of the Utility Plant that is associated with fire protection. Fire protection services are not provided to outside the city customers. Further, approximately 2.26% of the water delivered by the Water Division is used by outside the city customers. Therefore, 2.26% of the revenue requirements is charged to outside the city customers. This is shown in Table VII-2.

### **Revenue Requirements**

Based upon the dollar weighted allocations from Table VII-2, the revenue requirements for FY1993 through FY1997 are shown in Table VII-3.

### **Required Rates - Unit Costs**

The unit costs for each of the five service categories for outside the city customers are shown in Table VII-4.

Using the current water rate structure, a base monthly rate which includes 6,000 gallons of water and an overage charge per 1,000 gallons of water used in excess of the 6,000 gallons per month is developed by mathematical calculation for FY1993

**Table VII-1**  
**Sandy City Water Division**  
**Allocation of Operating and Maintenance Costs**

	FY 1993	Allocation					Allocation				
		Fire Protection	Facility	Variable	Meters	Equivalent Meters	Fire Protection	Facility	Variable	Meters	Equivalent Meters
Personnel Costs	\$678,523	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$339,262	\$339,262
Office Expense and Supplies	\$72,369	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$36,185	\$36,185
Facilities Supplies and Maintenan	\$122,500	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$61,250	\$61,250
Transportation	\$227,824	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$113,912	\$113,912
Utilities	\$1,002,862	0%	9%	91%	0%	0%	\$0	\$90,258	\$912,604	\$0	\$0
Water Purchases (2730)	\$1,172,800	0%	9%	91%	0%	0%	\$0	\$105,552	\$1,067,248	\$0	\$0
Professional Services	\$300,318	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$150,159	\$150,159
Insurance	\$59,019	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$29,510	\$29,510
Administrative Charges (3200)	\$527,097	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$263,549	\$263,549
Uncollectible Accounts (5500)	\$1,500	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$750	\$750
Sundry Charges (6100)	\$20,000	0%	0%	0%	50%	50%	\$0	\$0	\$0	\$10,000	\$10,000
Total Operating Expenses	\$4,184,812						\$0	\$195,810	\$1,979,852	\$1,004,575	\$1,004,575
Percent							0.00%	4.68%	47.31%	24.01%	24.01%

**Table VII-2  
Sandy City Water Division  
Allocation of Revenue Requirements**

Table	FY 1993	Allocation						Allocation				
		Fire Protection	Facility	Variable	Meters	Equivalent Meters		Fire Protection	Facility	Variable	Meters	Equivalent Meters
Operations and Maintenance	IV-3	\$4,184,812	0.0%	4.7%	47.3%	24.0%	24.0%	\$0	\$195,810	\$1,979,852	\$1,004,575	\$1,004,575
Modified Depreciation Expense	VI-2	544,124	0.0%	40.3%	59.7%	0.0%	0.0%	\$0	\$219,282	\$324,842	\$0	\$0
Modified Return on Rate Base	VI-3	4,769,134	0.0%	40.3%	59.7%	0.0%	0.0%	\$0	\$1,921,961	\$2,847,173	\$0	\$0
Revenue Requirement		\$9,498,070						\$0	\$2,337,053	\$5,151,867	\$1,004,575	\$1,004,575
Percent of total system	2.26%							0.00%	24.61%	54.24%	10.58%	10.58%
Revenue Requirement	VI-4	\$214,301						\$0	\$52,730	\$116,240	\$22,666	\$22,666

**Table VII-3  
Sandy City Water Division  
Revenue Requirements**

	% Allocation	Table	FY1993	FY1994	FY1995	FY 1996	FY 1997
Fire Protection	0.00%	VII-2	\$0	\$0	\$0	\$0	\$0
Facility	24.61%	VII-2	\$52,730	\$55,850	\$58,216	\$60,650	\$62,546
Variable	54.24%	VII-2	\$116,240	\$123,117	\$128,333	\$133,700	\$137,879
Meters	10.58%	VII-2	\$22,666	\$24,007	\$25,024	\$26,070	\$26,885
Equivalent Meters	10.58%	VII-2	\$22,666	\$24,007	\$25,024	\$26,070	\$26,885
Total Requirements		VI-4	\$214,301	\$226,981	\$236,597	\$246,491	\$254,195

**Table VII-4  
Sandy City Water Division  
Required Rates - Unit Costs**

	Allocations Unit	Table	FY1993	FY1994	FY1995	FY 1996	FY 1997
Fire Protection	Account	VII-3	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Facility	1,000 Gal.	VII-3	\$0.329	\$0.343	\$0.353	\$0.362	\$0.368
Variable	1,000 Gal.	VII-3	\$0.725	\$0.757	\$0.778	\$0.799	\$0.812
Meters	Account	VII-3	\$36.692	\$38.397	\$39.542	\$40.700	\$41.467
Equivalent Meters	Account	VII-3	\$36.692	\$38.397	\$39.542	\$40.700	\$41.467
Summary		Planned 1993	FY1993	FY1994	FY1995	FY 1996	FY 1997
Daily Customer Base Amount (with 6,000 gallons per month)	Daily	\$0.565	\$0.412	\$0.430	\$0.443	\$0.455	\$0.463
Over 6,000 gallons per month	1,000 Gal.	\$0.710	\$1.053	\$1.100	\$1.130	\$1.161	\$1.180
Annual Cost (Average of 20,000 per month)		\$325.51	\$327.28	\$341.81	\$351.51	\$361.16	\$367.30
Annual Change (%)			0.5%	4.5%	7.4%	5.6%	4.5%
	Monthly Usage (Gallons)	Planned 1993	FY1993	FY1994	FY1995	FY 1996	FY 1997
Monthly Cost for Residential Customer	6,000	\$16.95	\$12.35	\$12.81	\$13.28	\$13.66	\$13.90
	10,000	\$19.79	\$16.57	\$17.31	\$17.80	\$18.30	\$18.82
	15,000	\$23.34	\$21.83	\$22.81	\$23.46	\$24.10	\$24.52
	20,000	\$27.13	\$27.10	\$28.49	\$29.29	\$30.10	\$30.61
	25,000	\$30.44	\$32.37	\$33.81	\$34.76	\$35.71	\$36.31

through FY1997.

### **Comparision**

A comparison of a 20,000 gallon per month customer is shown in Table VII-4. These required rates are about 1% higher than the "planned 1993" rates. The monthly usage for five residential levels of water use is shown for comparison.

While the allocation of costs between the base charge and the commodity charge is different, the average outside the city residential customer would pay about the same under either rate structure.

### **Conclusion**

Based upon the foregoing analysis, the rate presently charged the average non-Sandy City resident customer by Sandy City is justified under the AWWA recommended cost of service methodology.

Tab C



TESTIMONY OF STEVEN R. MCFARLAND

1 Q. Would you please state your name and address for the record?

2 A. My name is Steven R. McFarland. My business address is 1121  
3 East 3900 South, Suite C-100, Salt Lake City, Utah 84124-  
4 1214.

5 Q. By whom are you currently employed?

6 A. I am a licensed professional engineer in the state of Utah and  
7 I am currently employed by Eckhoff, Watson & Preator  
8 Engineering.

9 Q. Would you please summarize your education and professional  
10 work experience for the Commission?

11 A. I have attached as Exhibit 1 a copy of my current curriculum  
12 vitae which states my educational background and summarizes my  
13 work experience.

14 Q. Are you familiar with the culinary water system of Sandy City?

15 A. Yes. My duties at Eckhoff, Watson & Preator have included  
16 assisting Sandy City in planning necessary capital  
17 improvements for its water system as well as identifying  
18 potential problem areas.

19 Q. Have you assisted Sandy City in analyzing the White City Water

1           Company system, and improvements which may be required if that  
2           system is acquired by Sandy City?

3       A.    Yes.  In order to assist Sandy City in analyzing the effect of  
4           acquiring the White City Water Company system, I have  
5           conducted a review and analysis of that system for Sandy City.  
6           That review has placed particular emphasis on the possible  
7           acquisition and integration of the White City Water system  
8           into the Sandy City system.

9       Q.    Did you prepare a report for Sandy City based upon your  
10           analysis?

11      A.    Yes.  Attached as Exhibit 2 is the engineering analysis and  
12           recommendations of Eckhoff, Watson & Preator with respect to  
13           the White City Water Company.

14      Q.    Would you please describe the process you used in the  
15           preparation of that report?

16      A.    I began my analysis with the preparation of the existing water  
17           network map for the White City Water Company system.  That  
18           system network is included as Figure 1 to my report.  The  
19           existing White City water lines are those which appear in that  
20           report in blue and grey.  Once I completed the preliminary  
21           network map, I met with Ladell Harston of the White City Water  
22           Company to review that map in detail, including the sizes of  
23           the various lines, the age and condition of those lines and  
24           other operating information with respect to the White City  
25           Water system.

1 Q. Would you generally describe the White City Water Company  
2 system for the Commission?

3 A. The White City Water Company system has many water lines and  
4 facilities that need replacement, improvement and expansion.  
5 Though the White City Water Company has adequately maintained  
6 the existing system in the past, and has had no major problems  
7 to my knowledge, it is now to the point that increasing  
8 amounts of capital improvements will be necessary to meet the  
9 future needs of its customers, as well as protect the health,  
10 welfare and safety of customers of the White City Water  
11 Company.

12 Q. Could you describe the White City Water Company system in  
13 relation to the current Sandy City system.

14 A. The White City Water Company system is basically surrounded by  
15 Sandy City and the Sandy City water system. The map attached  
16 as Exhibit 3 to my testimony show the Sandy City limits,  
17 subdivision lots served by the Sandy City water system and by  
18 the White City Water Company system.

19 Q. Does the White City Water Company system consist of more than  
20 one zone?

21 A. The White City Water System is made up of two zones, the upper  
22 zone, which is the portion of the system east of 1300 East and  
23 the lower zone, which is basically between 700 East and 1300  
24 East. Both zones are bordered by 9400 South and 10600 South.

1 Q. What are the sources of supply for the White City Water  
2 Company?

3 A. The White City Water Company obtains most of its water from  
4 its own wells. The White City Water Company does not,  
5 however, have sufficient storage, which means that during an  
6 emergency some of the pressurization for the system comes from  
7 pumping from those wells. The Salt Lake County Water  
8 Conservancy District currently provides all but one-half  
9 million gallons of the upper zone's water storage, but makes  
10 no guarantees concerning fire protection.

11 Q. Was part of your assignment to identify potential shortcomings  
12 in the current White City Water Company system, and identify  
13 improvements which would solve those shortcomings?

14 A. Yes. In order to do that, I used Cybernet, a computer  
15 modeling program used to simulate large water networks. In  
16 order to use that program, it was necessary to put the White  
17 City Water Company system on Autocad, including the sizing of  
18 the various lines in that system and the sources of supply.  
19 I then used Cybernet to identify whether the system could meet  
20 the fire protection needs, and the system supply needs, of the  
21 customers on the current system.

22 Q. What was the result of your computer simulation?

23 A. In several major fire scenarios, significant safety concerns  
24 were identified by the computer modeling. Specifically, the

1           current system, with its limited storage capacity and line  
2           size deficiencies, would not meet the fire safety standards  
3           established by Sandy City fire department for a number of  
4           specific potential fire scenarios within the White City Water  
5           Company service territory.

6       Q.    Would you describe the specific fire scenarios you ran?

7       A.    Yes.   Approximately 100 computer runs were made to determine  
8           the system's ability to control residential, school, and  
9           commercial fires at various locations.   The summary of each  
10          general system scenario are contained in my work papers.   I  
11          used scenarios which would be simulations of realistic fire  
12          situations, i.e. a fire at a specific school, shopping center  
13          or residential neighborhood.

14      Q.    Based upon your analysis, have you prepared schedules of  
15           needed capital improvements?

16      A.    Yes.   I began my analysis using capital improvements which  
17           have already been identified by the White City Water Company  
18           and which are attached as Table 1 to Exhibit 2.   The White  
19           City Water Company's analysis indicates that nearly \$3.6  
20           million in capital improvements are necessary.

21      Q.    Do you agree with that analysis?

22      A.    Yes, I am in general agreement that significant major  
23           improvements are needed.   However, White City Water Company

1 improvements that are recommended do not include an  
2 additional 1.5 million gallons of required water storage at a  
3 total additional cost of \$300,000, which I believe is  
4 necessary for minimum water service and fire protection. In  
5 addition, I believe that system rehabilitation costs (pipe  
6 material/installation costs, fire hydrants, valves, etc.) will  
7 be approximately \$353,000 more than estimated by White City  
8 Water Company. Also, additional system upgrades and  
9 improvements of \$500,000 must be made to the system to satisfy  
10 safety concerns raised by computer modeling with a gravity  
11 operated system. In fact, I have prepared Table 2 to  
12 Exhibit 2 to indicate the total capital improvement costs  
13 which I believe are required to bring the White City system to  
14 the level of performance comparable to minimum Sandy City  
15 water system standards. The approximate amount of those  
16 improvements totals \$4.7 million, compared to the  
17 approximately \$3.6 million in improvements proposed by the  
18 White City Water Company.

19 Q. Would you explain the major differences between the necessary  
20 capital improvements you have identified compared to those  
21 which the White City Water Company has identified on Table 1?

22 A. The approximate \$1.15 million difference between the  
23 improvements which White City proposes and the improvements I  
24 summarize in Table 2 to Exhibit 2 fall into three categories  
25 discussed above (water storage, system rehabilitation, and

1 system upgrades. First, water storage costs per unit are  
2 less (\$.60 compared to \$.40 per gallon) but 1.5 million more  
3 gallons of storage are recommended. The next major difference  
4 is materials unit costs, for instance, I used a unit cost of  
5 \$25.00 for 6" line replacements instead of the \$22.00 figure  
6 used by White City, resulting in a difference of  
7 approximately \$191,000. (Exhibit 2, line 3, Tables 1 and 2).  
8 Also, a major difference in rehabilitation costs of the need  
9 to replace old substandard fire hydrants, closed or lost  
10 valves and disconnected piping which accounts for \$112,000  
11 (Exhibit 2, lines 6 and 8, Tables 1 and 2). Finally, an  
12 additional \$440,000 is required to increase water line sizes  
13 to provide minimum fire flows particularly for schools and  
14 housing in the lower zone. The improvements recommended are  
15 detailed in Appendix "A" to Exhibit 2. The lines recommended  
16 for upgrade are those lines which computer modeling identified  
17 as potential fire protection concerns.

18 Q. Have you analyzed whether certain efficiencies could be  
19 realized if the Sandy City system were consolidated with the  
20 White City water system?

21 A. Yes. In Table 4 to Exhibit 2, you will note that a  
22 consolidated system approach will potentially reduce the  
23 capital improvement costs described in Table 2 to Exhibit 2 by  
24 approximately \$831,000. The reduced costs are a result of

1           efficiencies realized through the combination of the White  
2           City Water Company system and the system of Sandy City. In  
3           addition to these hard dollar savings, a number of other  
4           efficiencies would be realized including minimizing the long-  
5           term roadway maintenance costs by reducing the number of lines  
6           which go through various city streets.

7       Q.   Does this complete your testimony?

8       A.   Yes.



Tab 1

## **STEVEN R. MCFARLAND, P.E.**

Project Manager/Civil Engineer, Eckhoff, Watson and Preator Engineering, Inc.

### **Years of Experience**

20 years in both the public and private sectors

### **Education**

B.S.C.E., Civil Engineering, University of Utah, 1974

M.S.C.E., Transportation/Traffic Engineering, University of Utah, Cum Laude, 1978

Post Graduate, Land Planning Certificate, University of Utah, 1978

### **Registration**

Professional Engineer: Utah 1980, #0540309114; Oregon 1989, #14328PE

### **Professional Affiliations**

American Society of Civil Engineers

American Concrete Institute

Institute of Transportation Engineers

Society of American Military Engineers

Transportation Systems Users Group

## **PROFESSIONAL EXPERIENCE**

### **CIVIL ENGINEERING:**

Culinary Water:	Water springs and well development and treatment, water storage, water transmission and distribution, hydraulics, cost analysis, rate studies, computer modeling, and network design.
Flood Control:	Stream bank stabilization, hydrology computer models, flood routing, riprap, gabions, and retaining walls.
Municipal Engineering:	Utility coordination, relocation, reconstruction, construction approval, water, sewer, storm drainage, gas, power, phone, seismic/life line evaluation and design, etc.
Roadway Design:	Freeways, arterials, collectors, locals, two-way and one-way couplets, intersections, roadway super elevation design, drainage, bridges, and pavement design.
Sanitary Sewer:	Infiltration investigation and correction, collection and transmission system design, lift stations, sanitation drainage fields, and sewage treatment lagoons.
Storm Drainage:	Master planning, sewer design, detention basins and structures, subsurface drainage, and lift stations.
Structures:	Retaining walls (concrete, crib-walls, steel, rock, etc.), irrigation diversion structures, and storm and flood control and misc. civil structures, and small bridges.

Surveying:	Boundaries, topographic work, mapping, platting, utilities, construction staking and property disputes.
Transportation and Traffic Engineering:	Extensive experience in transportation planning, traffic engineering and highway design. Broad-based experience in computer modeling from traffic intersections to large transportation system networks. Extensive roadway and freeway design including interchanges. Traffic signalization and geometrics, recreational transportation and urban design. Specialized transportation, bus transit, light and heavy rail, handicapped transportation.
Value Engineering:	Development cost analysis, cost/benefit analysis, market analysis and financial programming, rehabilitation evaluation and special studies.
Water Resources:	Hydrological studies water management, conservation studies, water quality and pollution control.

## **PROFESSIONAL EXPERIENCE**

### **Water and Water Resources**

- White City Water Company/Sandy City Water System, Sandy City, Utah. This project included a comprehensive analysis of the White City Water System under numerous operating scenarios including options that incorporated this system into the Sandy City Water System. Extensive computer analysis was completed using the Cybertechnology modeling network. The study included the analysis of water demand, water storage, transmission and distribution for numerous fire scenarios over a complex water network. Recommended improvements included quantity and cost estimates resulting in projected capital improvement cost savings ranging from \$800,000 to \$1.4 million.
- Sandy City Water System Capital Improvement Program, Sandy City, Utah. Computer modeling, quantity and cost estimates were developed as part of the short-range capital improvement program. Water demand, storage requirements and major transmission facilities improvements were recommended.
- Central Utah Water Conservancy Project, Provo City, Utah. This currently on-going project involved the planning, formulating and development of strategies for the future implementation of water works projects and water conservation projects in twelve county areas of Utah. Some of the major tasks included data collection, water use inventory, plan development, conservation strategies planning, and the development of a program to evaluate and select projects for future funding.
- Local Governmental Comprehensive Planning Project (LGCPP), Garfield, Piute and Wayne Counties, Utah. The LGCPP study is a pilot planning project designed to assist rural counties with economic development and planning management. This State of Utah sponsored project included key infrastructure elements, including water and water resources. Water resources, water rights, future water demand, water quality and pollution control, water systems analysis and fire protection analysis were analyzed at the county level. Formulation of capital



improvements including water rights acquisition system improvements, dam construction expansion are in the process of being completed.

- East Canyon Resort, Morgan County, Utah. Engineering design services provided included planning, design and construction management as follows:
  - spring development and water collection
  - well development planning and preliminary engineering
  - water storage design of three 25,000 gallon storage tanks
  - chlorination and water treatment including water sampling and monitoring
  - water transmission and distribution design for Phases I, II and III of the project.
- Mapes Ranch, Stanislaus County, California. This project included the preliminary engineering planning and design for a projected new planned community development of 60,000 to 100,000 residents including a new University of California campus. Water related tasks included water rights studies, groundwater research and analysis, conceptual water treatment design and cost analysis, water system, design and cost estimate, environmental water impact analysis, and secondary irrigation water use and disposal.

## **SUMMARY OF PROJECTS**

### **CIVIL ENGINEERING**

The Highlands Apartments - Hayward, CA  
Golf Creek Apartments - Portland, OR  
Layton Hills Mall Addition, Layton, UT  
Olive Garden Restaurant, Layton, UT  
Block Buster Video, Layton, UT  
Evans & Sutherlands, Phase I, II, III, U. of U., UT  
Utah State Retirement Board, S.L.C., UT  
Rick Warner Ford, S.L.C., UT  
Rick Warner Mitsubishi, Ogden, UT  
Utah State Fairgrounds, Exhibition Bldg.#1, S.L.C., UT  
Utah Air National Guard, Hush House, S.L.C., UT  
Utah Transit Authority, Central Division, S.L.C., UT  
Utah Department of Trans., 1300 East, S.L.CO., UT  
Dugway Proving Grounds, storage bunkers, UT  
Tooele Army Depot, Building 619, UT  
Veteran Admin. Hospital, Brine Bldg., S.L.C., UT  
S.L. County Flood Control, Big Cottonwood Creek, S.L.CO., UT  
Cottonwood Mall Creek Stabilization Project, S.L.C., UT  
Holladay Nursing Center, Holladay, UT  
Eye Institute of Utah, S.L.C., UT  
Gables, Tanner Lane, & Chimney St. Condos., S.L. CO., UT  
Numerous Subdivisions along the Wasatch Front, UT  
Restrictive Hillside Subdivisions: Olympus Hills, Perrys Hollow (S.L.C. north bench), Farmington  
Bench, Wasatch Front area, UT  
East Canyon Resort & Marina, Morgan County, UT

Coca Cola Company, West Valley, UT  
A.R.U.P. Medical Laboratories, S.L.C., UT  
L.D.S. Computer Center, S.L.C., UT  
L.D.S. Church: numerous church and stake sites, UT, Western States, Hawaii  
L.D.S. Cottonwood Granite Vaults, hillside stabilization Little Cottonwood Canyon, S.L.CO., UT  
B.Y.U. Foreign Student Housing, Provo, UT  
H.A.F.B. Stage I,II,III, Layton, UT  
H.A.F.B. Aircraft Museum, Layton, UT  
Day Care Center, "For Children Only", S.L.C., UT

## **TRANSPORTATION/TRAFFIC ENGINEERING**

Light Rail Transit Phase II Expansion Plan, Salt Lake City to University of Utah, S.L.C., UT  
University of Utah Parking and Transportation Master Plan, S.L.C., UT  
East Canyon Resort, Morgan County, UT  
LDS Church Downtown Transportation and Parking Master Plan, S.L.C., UT  
Alameda Consolidated Transportation Corridor Project, Los Angeles, CA  
Downing Avenue/I-5 and French Camp/I-5 Interchanges, Stockton, CA  
Morada Lane/SR-99 Freeway Interchange, Stockton, CA  
Salt Lake City Transportation Capital Improvement Program, S.L.C., UT  
Syracuse/Layton Interchange, Layton, UT  
Transportation Planning, Computer Modeling, and special transportation studies while with the  
Wasatch Front Regional Council, the five county transportation Metropolitan Planning  
Organization (MPO), UT  
Mapes Ranch Development, Stanislaus County, CA  
Wasatch County, Mayflower Mine Access Road, Wasatch County, UT  
Midvale City Traffic Signal Study, Midvale City, UT  
La Morada Development, signalization of six intersections, Stockton, CA  
Duck Creek Development, traffic impact study and signalization, Stockton, CA  
Stangl Business Park, West Valley City, UT  
Triad Center Parking Study, S.L.C., UT  
Black Rock Interchange, Tooele County, UT  
Layton Hills Mall Addition, Layton, UT  
Sun Peak Transportation Study, Park City, UT  
Ketchum Transportation Study, Ketchum, ID  
Bigtooth Traffic Study, Sun Valley, ID  
Mayflower Mountain Resort Transportation Master Plan, Park City, UT  
1300 East roadway widening and rehabilitation, S.L.CO., UT  
Plum Tree Shopping Center, Provo City, UT  
Valley West Hospital, West Valley City, UT  
Salt Lake International Center Interchange, Salt Lake City, UT

Roadway design for various subdivisions, condominium, and major apartment complexes along  
the Wasatch Front area

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**WATER AND WATER RESOURCES**

White City Water Company/Sandy City Water Study, Sandy City, UT  
Sandy City Water System Capital Improvements Program, Sandy City, UT  
Sandy City Water Rate Study, Sandy City, UT  
Central Utah Water Management Project, twelve county area, UT  
Local Government Comprehensive Planning Project, Garfield, Piute and Wayne Counties, UT  
East Canyon Resort, Morgan County, UT  
Mapes Ranch, Stanislaus County, CA  
Weston Ranch, San Joaquin County, CA  
Highway 152 Planned Community Development, San Joaquin Valley, CA

The engineering design of numerous water distribution systems for subdivisions, condominium projects and commercial/industrial development in Utah and the western United States.

Tab 2

**WHITE CITY WATER COMPANY  
WATER SYSTEM**

**Engineering Analysis and Recommendations**

*Prepared for*

**PARSONS BEHLE & LATIMER**  
*A Professional Law Corporation*  
201 South Main Street, Suite 1800  
Salt Lake City, Utah 84147-1898

and

**SANDY CITY CORPORATION**  
**PUBLIC WORKS DEPARTMENT**  
8775 South 700 West  
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*Prepared by*

**Eckhoff Watson and Preator Engineering**  
1121 East 3900 South  
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(801) 261-0090



***Sandy City and White City Water Companies***  
***Technical Report No. 1***

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## I. EXECUTIVE SUMMARY

### A. INTRODUCTION

**Working Paper No. 1** analyzes the *White City Water Company* system in terms of its engineering operation and compliance with local, state, and national ordinances, regulations and sound engineering practices. It is essential to determine existing system operating conditions, identify problem areas and evaluate needed system or area-specific improvements. Area or system deficiencies identified, have been quantified in terms of repair or replacement costs. Much of the information on system piping and operations in the White City system has been provided by White City Water Company or their consulting engineer. It is beyond the scope of this study to inspect and verify this information. However, with the given system information and EWP's computer modeling efforts, valuable operating and cost information on the existing and future system needs has been generated for decision and policy makers. Detailed computer model information not contained in this report is available upon request.

### B. FINDINGS and RECOMMENDATIONS

The existing White City Water Company system requires substantial improvements in three main areas: 1) replacement of aging pipes, valves, meters, hydrants, etc.; 2) improvements in the water distribution system (pressure and flow) to correct fire delivery capabilities and customer service deficiencies, including lawn sprinkling systems; and 3) additional water storage capacity, particularly for the upper water pressure zone above 1300 East.

Assuming Sandy City does not acquire the recommended system improvements to correct the White City Water Company deficiencies in the lower and upper zones are expected to cost approximately \$4.71 million under the "worst case" scenario. The worst case scenario occurs during the summer peak hour, when a power failure simultaneously occurs. This is the worst condition because water from wells throughout the White City Water Company system play a significant role in maintaining water flow and pressure, particularly in the lower pressure zone. If water from wells is not pumped into the system, water supplies must come solely from storage reservoirs. Pipe sizes, particularly in the lower zone, are undersized. When a fire occurs, a large water volume is required, particularly for churches, schools, shopping centers or other large buildings. High fire flow volumes through small pipes cause significant friction losses and low unacceptable water pressure (under 20 psi). Providing minimum fire protection will require larger replacement water lines than presently planned by White City, and the removal and up-sizing of many existing water lines not planned for replacement. The lower pressure zone lacks a systematic network of major trunk lines. Theoretical fire flow problems were detected generally at the end of the lines where water (from storage reservoirs) traveled substantial distances in small diameter pipes. These problems were found in several north and south locations in the upper and lower zones.

The analysis of the White City system considered three different proposed improved water system concepts or scenarios.

## SCENARIO NO. 1

**Scenario No. 1** evaluates the system improvements proposed by White City Water Company (see Figure 1 and Table 1 on the following pages). Computer model simulations indicated that minimum fire flow requirements could not be attained in numerous locations. Large fire flow requirements to schools, churches and the Canyon Shopping Mall of 3,000 gpm and 3,500 gpm were not attainable. Fires were also simulated in residential areas, at the top of each pressure zone to the far north and south portions of the two zones. In these areas, where the minimum fire flow of 1,500 gpm was simulated, water pressure dropped to unacceptable levels (below 20 psi). Numerous other serious system deficiencies under this scenario were also identified and are discussed in some detail later in the report.

A cost estimate of the proposed White City Water Company system (Scenario 1) is shown in Table 1. The types of deficiencies found in the analysis included items in the following general areas:

- Undersized or inadequate transmission and storage facilities with possible public health and safety implications.
- Poor water pressure for culinary water and irrigation use (sprinkling) particularly during the summer months.
- Inadequate fire protection with possible safety implications, property loss and/or loss of life. Fire protection problems included the following:
  - inadequate water pressures;
  - inadequate fire flow rates particularly to schools, churches, the Canyon Shopping Mall and other major structures;
  - the proposed installation of undersized fire hydrants;
  - questionable telemetry and warning devices particularly to Salt Lake County Water Conservancy District water supplies; and,
  - inadequate and aging water storage facilities and reliance on the Salt Lake County Water Conservancy District water storage facilities without any formal agreement for fire flow protection.

## SCENARIO NO. 2

The second scenario is basically the same as the first scenario in terms of ownership and general system configuration. The difference is that Scenario No. 2 water transmission lines and storage facilities have been upgraded to meet minimum fire flow requirements.

EW

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Because the lower pressure zone is so dependent on wells for maintaining minimum fire protection, it was essential

Figure 1 - White City Water Co.

Proposed Improvements (92-97)

EW

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Table 1 - White City Water Co.  
Proposed Improvements Cost Estimate (92-97)

to determine the impact of having the wells out of operation, simulating a power failure. While the probability of having a fire and power failure simultaneously is low, industry fire protection standards consider reservoir reserves and not supplemental pumped water sources in analyzing fire protection. Possible exceptions are special conditions such as independent backup power supplies. In the case of the White City system, backup power is not practical because aging pipes need replacement, and there are numerous well locations. The number of generators required would be cost prohibitive.

The proposed White City Water Company system improvements (Scenario No. 1) have inadequate reservoir capacity and unacceptable fire flows and pressure. In Scenario No. 1, a total water storage (upper and lower zones only) of approximately 4.17 million gallons (MG) is required, assuming that the upper and lower zones are interconnected by means of a pressure reducing valve. Currently, the White City system has a total storage of 2.0 MG, of which 0.5 MG is in the upper pressure zone and needs to be replaced. The 1.5 MG reservoir proposed by White City Water Company therefore is approximately 2.67 MG short of the required minimum supply. In Scenario 3, reservoir storage are combined with the Sandy City system, and the required fire flow storage of 0.63 MG is already provided, thereby reducing the total additional required storage shortage to 2.04 MG.

In the first scenario, proposed improvements to the existing mechanical, telemetry, and communication inadequacies, particularly at night, could be ineffective if Salt Lake County Water Conservancy District (SLCoWCD) reservoir reserves were gone. Currently, there are no written operating agreements to guarantee minimum water storage reserves for a White City fire in either zone.

While sufficient SLCoWCD water reserves normally exist which are critical to White City's upper pressure zone, the lower zone problems are virtually unaffected even if this supply was available. Adequate pressure is the main problem in numerous areas in the lower zone. In the upper zone several problems with pressure exist, specifically the Canyon Shopping Mall on 1300 East and residential areas in the far north (9000 South) and far south (10400 South) portions of the system near 2000 East. The recommended minimum improvements shown in Figure 2, correct the system distribution problems and increases pressures to at least 20 psi, the minimum standard for the "worst case" scenario. These improvements together with the required water storage upgrades are estimated to cost a total of \$4.71 million (refer to Table 2). This scenario will cost approximately \$1.15 million more than White City's estimated cost. Table 3 is a cost estimate of the required capital improvements necessary if water pumped from the lower zone were allowed. This option is not allowed because a major fire could cause or be caused by a power failure.

### **SCENARIO NO. 3**

The third scenario or recommended plan is designed to eliminate duplication and maximize customer savings. This scenario shown on Figure 3, assumes that the White City Water Company system would be acquired by Sandy City. The purchase of this system by Sandy

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City Figure 2 - Recommended Minimum Improvements (92-97), (White City Water Co. ownership)

EW

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**Table 2 - Estimated Capital Improvement Costs (92-97), (White City Water Company ownership) (wells off)**



**Table 3 - Estimated Capital Improvement Costs (92-97), (White City Water Company ownership) (wells on)**

EW

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Figure 3 - Recommended System Improvements (92-97), Sandy City ownership

EW

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Table 4 - The Recommended Plan, Sandy City ownership, Cost Estimate

would be necessary because of operational considerations (the numerous new line connections) and other financial accounting/operations limitations. Under this combined system, many of the required White City system improvements for minimum fire protection would not be necessary. The major trunk lines that the White City Water Company needs on 9000 South, 9400 South, 700 East and 1300 East, already exist in the Sandy system. The total estimated cost, shown in Table 4 of \$3.88 million would save existing White City Water Company customers approximately \$831,000 in capital improvements alone. Duplication of new White City water lines in these streets when Sandy City water lines are already present, is a serious waste of public money. Another example of this same type of problem is on Highland Drive (2000 East) where both Sandy City and White City require a new main water line on Highland Drive. Sandy City will construct a 16 inch water line as part of its proposed expansion to complete it's water distribution grid. White City requires 10 inch water lines to achieve minimum fire flows and pressures. The need for the 10 inch line would be eliminated if the two systems were combined.

Under Scenario No. 3, other problems with low pressure and inadequate fire flows would also be eliminated. Aging and worn out facilities would be replaced. Similar significant savings in new water storage facilities could also be realized through a combined system.

The primary benefit or incentive for considering this alternative should be capital and operating costs. This report does not explore operating costs, but it is estimated that they would likely be equal to or less than present White City costs. This savings is expected in a combined system because of larger system efficiency and the elimination of duplicated services. Capital cost savings, however, are significant and estimated to be \$831,000. This represents the difference that the recommended system, Scenario 3, saves the customer over Scenario 2, the independent upgraded White City Water Company system. These saving are categorized as follows:

● System rehabilitation and mainline upgrade savings	\$213,000
● Additional water storage capacity savings	\$400,000
● Distribution and miscellaneous system improvements savings	<u>\$218,000</u>
<b>Total System Savings:</b>	<b>\$831,000</b>

Major water system improvements to the White City system are recommended whether or not Sandy City acquires the White City Water Company. The main difference under the Sandy City ownership scenario is that many of the required capital improvement costs could be eliminated. This is because many of the required White City lines and water storage facilities already exist in the Sandy City system. Replacement of old and aging piping and facilities will be required regardless of water system ownership. While this report does not address system financing, it is more likely that Sandy City would be able to defer or spread out these major replacement costs over a much longer period of time than the White City Water Company. This may or may not be a key item to residents being forced to pay for required improvements to assure minimum health and safety standards.

It should be noted that the above capital improvement costs are limited to White City Water Company's lower and upper water zones. The "high upper zone", the area either side of the proposed Highland Drive extension at approximately 9400 South, is also part of the Company's franchise area. This area, comprising approximately 134 undeveloped acres cannot be served by either the White City Water Company or Salt Lake County Conservancy District without major construction costs primarily for water storage and transmission facilities. From a cost savings perspective, capital improvements for the high upper zone should realistically be provided by Sandy City. White City Water Company is however under franchise obligation to provide this service, whereas Sandy City has no such requirement. As discussed later, the cost for water services for the "high upper zone" if provided by White City Water Company or the Salt Lake County Water Conservancy District would be approximately \$900,000, of which the majority is for fire protection improvements. If Sandy City provided this service, existing fire storage reserves and transmission lines could be used. This would result in a total cost of only \$250,000, or a savings of approximately \$650,000 in construction costs, a dramatic public savings.

In summary, the total capital cost savings that would be possible by allowing the Sandy City water system to acquire or combine with the White City water system, would be approximately \$1,480,000 (\$830,000 plus \$650,000).

## II. WATER and FIRE CODE REGULATIONS and REQUIREMENTS

### A. INTRODUCTION

In the State of Utah, the design of any public water system for culinary and secondary (irrigation) use must meet basic regulations in three specific areas, these are as follows<sup>1</sup>:

- Water source requirements
- Water storage requirements
- Water distribution requirements

When complying with the above components of a water system, consideration must also be given to the following sub-components: indoor water needs, irrigation water needs, and fire flow requirement needs. The total amount of water required (whether for source, storage, or distribution requirements), is the sum of all three water sub-component needs.

In 1990, the White City Water Company had approximately 3,588 residential connections and 35 commercial connections within its existing service area. The following table is a listing of the estimated existing and future water connections by water pressure zone:

**TABLE 1**  
**TOTAL EQUIVALENT RESIDENTIAL CONNECTIONS (ERC's)**

Year	Lower Zone	Upper Zone	Sub-total	High Upper Zone	Total
1989	2,236	1,424	3,660	0	3,660
1990	2,166	1,601	3,767	0	3,767
1995	2,366	2,001	4,367	491*	4,858

\*The high upper zone may or may not be fully developed by 1995, this number represents estimated full build out.

For purposes of this analysis, the lower and upper zones are analyzed separately from the "high upper zone" which is discussed later. In 1995, the upper and lower zones will be estimated to have a total of 4,367 ERC's. The following discussion presents both the State

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<sup>1</sup>*State of Utah Public Drinking Water Regulations*, State of Utah, Department of Environment Quality, Division of Drinking Water, 5th Revision, February 1, 1986, Chapter 5.

of Utah minimum requirements as well as a discussion of recommended minimum requirements based on existing conditions and the unique characteristics of the White City Water System.

## **B. SOURCE REQUIREMENTS<sup>2</sup>:**

### Indoor or Domestic Use (Culinary Water)

Water source, or well production in the case of White City Water Company, must be capable of providing 800 gallons per day (gpd) per equivalent residential connection for indoor use. Production capabilities or water supply must also be capable of providing an annual total of 146,000 gallons (0.45 acre-feet) per ERC per year. The water supplier by law must have the legal right to use the required amount of water.

### Outdoor or Irrigation Use (Secondary Use)

Peak flow irrigation source requirements for Utah's Zone 4, which includes all of White City and Sandy City, is 3.96 gpm per irrigated acre of land (2848 gallons/acre/day) and an average yearly irrigation demand of 1.87 acre-feet per irrigated acre.

### Fire Flow Regulations

Fire flow regulations imposed by local and county agencies primarily help to establish sizing for water distribution systems and reservoir storage needs. Source requirements for fire flow should be capable of restoring the water system's storage supplies in a reasonably short period of time. In general, the source should be capable of supplying sufficient water supplies to restore normal operations in one day or less while still meeting the normal water system demands. The required minimum fire flow requirement used for modeling purposes was 3,000 gpm to 3,500 gpm for three hours for a commercial/school/church (large type building) fire and 1,500 gpm for a residential fire. Therefore, it is recommended that the source water restoration rate be 440 gpm each hour or greater for 24 hours to restore fire flow reserves. Fire flow water reserves for a 3,500 gpm fire for three hours (630,000 gallons), must be maintained as a minimum storage requirement and never fall below this level during any period of the day. The upper zone currently has a 500,000 gallon reservoir with reserve storage from Salt Lake County Water Conservancy District, but White City has no formal or informal fire water storage protection agreement.

The 1995 water source requirements for White City Water Company shown on the next page, are computed follows:

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<sup>2</sup>Required daily and required yearly water demands are according to the *State of Utah Public Drinking Water Regulations. Refer to Footnote No. 1, Section 5.1.1-a, "Source Capacity".*

**Average Daily Demand (1995):**

**Indoor (Culinary) Demand (1995):**

Req'd. Daily:  $4,367 \text{ ERC} \times 800 \text{ gal./day} = 3.494 \text{ million gal. per day} = (10.72 \text{ ac.ft./day})$   
 Req'd. Yearly:  $4,367 \text{ ERC} \times 0.146 \text{ MG/yr.} = 638 \text{ MG/yr.}(1,957 \text{ ac. ft./yr.})$  MG=million gal.

**Indoor (Culinary) Actual Consumption (1990):**

Avg. Annual Daily Demand (AADD)<sup>3</sup>:  $3.05 \text{ ac. ft./day} = 690 \text{ gpm}$   
 Peak Daily:  $3.0 \times \text{AADD} = 3.0 \times 3.05 = 9.15 \text{ ac. ft./day} (2,070 \text{ gpm or } 2.981 \text{ MGD})$   
 Peak Hourly:  $3.5 \text{ to } 4.0 \times \text{AADD} = 10.68 \text{ to } 12.20 \text{ ac. ft./day} (2,417 \text{ to } 2,761 \text{ gpm})$

**Outdoor (Irrigation) Demand (1995):**

Req'd. Daily:  $4,367 \text{ ERC} \times 0.1458 \text{ ac.}^4 \times 3.96 \text{ gpm./ac.} = 2,521 \text{ gpm} = 3.631 \text{ MGD, } 11.14 \text{ ac. ft.}$   
 Req'd Yearly:  $4,367 \text{ ERC} \times 0.1458 \text{ ac./unit}^4 \times 1.87 \text{ ac. ft./ERC} = 1,191 \text{ ac. ft./yr.}$   
 (consumptive)  
 Actual Required Yearly =  $1,191 \times 2 = 2,382 \text{ ac. ft./yr.}$   
 Peak Hourly:  $2.0 \text{ to } 3.0 \times \text{peak day} = 5,000 \text{ to } 7,500 \text{ gpm (estimated)}$

**Fire Flows (required flow rates):**

Residential:  $1,500 \text{ gpm} \times 2 \text{ hrs.} \times 60 \text{ min./hr.} = 180,000 \text{ gal.}$   
 Commercial:  $3,500 \text{ gpm} \times 3 \text{ hrs.} \times 60 \text{ min./hr.} = 630,000 \text{ gal.}$

**Peak Hourly Source Capability Requirements (1995): 7,417 to 10,261 gpm**

**Average Total Daily Source Requirement (1995):**

Indoor + Outdoor demand =

<sup>3</sup>Source: Computer from White City Water Company information, refer to Table 9, page 22, "Total Water Production". Calculated value based upon the 1981 to 1990 average monthly consumption for the months of November to and including March (5 winter months total - assumes irrigation demand is zero).

<sup>4</sup>The average lot in the lower zone has approximately 1/8-acre of irrigated ground. The upper zone has approximately 1/6-acre of irrigated ground per lot.



$$10.72 \text{ ac. ft.} + 11.14 \text{ ac. ft.} = 21.86 \text{ ac. ft./day} = 4,946 \text{ gpm}$$

**Annual Source Requirement (1995):**

<u>Indoor:</u>	4,367 ERC x 0.45 ac. ft. =	1,965 ac. ft./yr.
<u>Outdoor:</u>	4,367 ERC x 0.1458 ac./ERC x 1.87 ac. ft./ac. x 2 =	<u>2,382 ac. ft./yr.</u>
	<b>Total</b>	<b>4,347 ac. ft./yr.</b>

It should be noted that the State of Utah requirements for daily water source supplies are met in terms of the actual total daily demand or the average peak day demand. Actual water source supplies provide surplus water which is sold to the Salt Lake Water Conservancy District.

**C. STORAGE REQUIREMENTS:**

Water storage requirements are governed by Section 5 of the *State of Utah Public Drinking Water Regulations*<sup>5</sup>. Water storage requirements must meet: indoor water use, irrigation water use, and local fire flow regulations.

**Indoor Or Culinary Use**

Storage requirements for indoor water use must have a capacity of 400 gallons per ERC. The actual required amount however, depends on a number of water consumption factors typically indicated by: family size, home size, home amenities (pool, jacuzzi, etc.), and income.

**Outdoor Or Irrigation Use**

Water storage requirements for irrigation or secondary water use should be based on specific local conditions which include soil conditions, slope, groundwater, plant or vegetation intensity and plant mix, winds, temperature and extent of urbanization (location/relation to buildings, pavement, etc.).

The Bureau of Public Water Supplies has established minimum requirements that water irrigation systems must meet. The Bureau categorizes Salt Lake County, including the White City and Sandy City areas, as a "moderately high" irrigation water demand area

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<sup>5</sup>***State of Utah Public Drinking Water Regulations***, State of Utah, Department of Environment Quality, Division of Drinking Water, 5th Revision, February 1, 1986, Chapter 5.

(Zone 4 classification). Under the regulations, the minimum storage requirement for an average weather season is 2,848 gallons per irrigated acre per day. During periods of above-normal conditions (hotter and drier than normal), additional irrigation water supplies would be needed. In very sandy areas with steep slopes, the need for additional irrigation water may increase dramatically.

In terms of average water application, this means that the average daily watering would be approximately 0.105 inches (less than 1/8") of water per day allowed for irrigation. In the hottest summer month of the year it is common for most lawns to require from 1/4 to 1/2 inch of water or more. In sandy soils during drought periods, the required minimum watering level to sustain plant life during hottest peak days could double to approximately 1/2 to 1 inch. Water companies must be sensitive to these demands and conditions. They must have the capabilities to provide the needed water supplies and to be able to cut back or control water use in drought

year conditions. A system unable to detect reservoir shortages or provide adequate domestic and irrigation supplies may be unable to adequately provide minimum fire flow requirements.

### Fire Flow Requirements

Requirements for fire protection are dependent upon the wide range of parameters, including the type and size of the structure, the mobility and ability of the occupants to escape fire and the fire protection systems or designs built into the structure (fire sprinklers, fire walls, roofs, doors). In the White City and Sandy City areas, 1,500 gpm was used as the minimum residential fire requirement for two hours for the average home. Schools, churches, or commercial type building fire requirements vary greatly. An average value 3,500 gpm for a three hour period is the typical or average condition identified<sup>6</sup>.

### **CALCULATED RESERVOIR STORAGE REQUIREMENTS (1995)**

Because system water pressures are dependent upon reservoir storage locations, the analysis of reservoir storage capacity must be made by pressure zone. White City Water Company's current franchise area covers three separate water pressure zones or areas referred to in this report as the "lower", "upper", and "high upper" zones. The lower and upper pressure zones are divided approximately by 1300 East, while the upper and high upper zones are approximately differentiated by the proposed future extension of Highland Drive.

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<sup>6</sup>Fire flow analysis calculations based upon various existing buildings with and without sprinkling systems including schools, churches, commercial buildings, etc. Source: Sandy City Fire Marshall, January 1992.

Storage facilities must be capable of providing the above indoor, outdoor and fire water demands and are computed as follows:

Indoor Demand:

Lower Zone:	2,366 ERC's x 400 gpd/ERC =	946,400 gal./day
Upper Zone:	2,001 ERC's x 400 gpd/ERC =	800,400 gal./day
High Upper Zone:	491 ERC's x 400 gpd/ERC =	<u>196,400 gal./day</u>
	<b>TOTAL</b>	<b>1,943,200 gal./day</b>

Outdoor Demand:

Lower Zone:	2,366 ERC's x 1/8-ac./ECR x 2,848 gpd/ERC =	842,296 gpd
Upper Zone:	2,001 ERC's x 1/6-ac./ECR x 2,848 gpd/ERC =	949,808 gpd
High Upper Zone:	491 ERC's x .1 <sup>7</sup> ac./ECR x 2,848 gpd/ERC =	<u>39,837 gpd</u>
	<b>TOTAL</b>	<b>1,831,941 gpd</b>

Fire Flow Requirements:

Lower Zone:	3,500 gpm x 3 hrs. x 60 mins./hr. =	630,000 gal./single fire
Upper Zone:	3,500 gpm x 3 hrs. x 60 mins./hr. =	630,000 gal./single fire
High Upper Zone:	3,500 gpm x 3 hrs. x 60 mins./hr. =	<u>630,000 gal./single fire</u>
	<b>TOTAL</b>	<b>1,260,000 gal./single fire*</b>

\*Note: Fire flow in the upper and lower zones can be combined. The future high upper zone cannot be served by the existing tanks in the lower and upper zones and therefore cannot be combined unless served by existing Sandy City reservoirs.

**TABLE 5**

**Total Water Storage Requirements  
(millions of gallons)**

Demand Type	Lower Zone	Upper Zone	High Upper Zone	Total
Indoor/Domestic	0.9464	0.8004	0.1964	1.9432
Outdoor/Irrig.	0.8423	0.9498	0.1398	1.9319
Fire	0.6300	0.6300	0.6300	1.8900
<b>Total</b>	<b>2.4187</b>	<b>2.3802</b>	<b>0.9662</b>	<b>5.7651</b>

<sup>7</sup>Because the high upper zone is estimated to have a commercial development/residential mix, a lower irrigation requirement was assumed.

As discussed in Section III and summarized in Table 6 below, water storage shortages exist but are supplemented by water reservoir reserves from the Salt Lake County Conservancy District. When fire storage requirements for the upper and lower zones are combined (a total of 630,000 gallons), a total of shortage of 2.67 MG exists. This figure assumes replacement of the existing 0.5 MG tank at 9800 South and Raintree.

**TABLE 6**  
**Water Storage Requirements By Scenario**  
(millions of gallons)

Scenario	Lower Pressure Zone	Upper Pressure Zone	Existing Water Storage*	Required Additional Storage
Existing	2.42	2.38	1.50	3.30
1 and 2	1.79	2.38	1.50	2.67
3	1.79	1.75	1.50	2.04 **

\*Note: It is assumed that the existing 0.5 MG storage tank located at 9800 South and Raintree Drive will be replaced within the next five years.

\*\*Fire protection water storage provided by existing Sandy City reserves.

#### **D. WATER DISTRIBUTION REQUIREMENTS<sup>8</sup> :**

The distribution system or pipe network must be designed to insure that a minimum of 20 psi exists at all points within the system during peak instantaneous flow conditions. Water distribution requirements can be defined as follows:

$$Q_t = Q_d + Q_i + Q_f$$

where:

$Q_t$  = Total Distribution Requirements

$Q_d$  = Indoor Flow Requirements

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<sup>8</sup>State of Utah Public Drinking Water Regulations, State of Utah, Department of Environment Quality, Division of Drinking Water, 5th Revision, February 1, 1986, Chapter 5.

$Q_i$  = Irrigation Flow Requirements  
 $Q_f$  = Fire Flow Requirements

### INDOOR REQUIREMENTS

Peak instantaneous flow for indoor domestic use is defined by regulation<sup>9</sup> to be:

$Q_d = 10.8 N^{0.64}$  where: N equals the total number of equivalent residential connections (ERC), and  $Q_d$  equals the total flow (in gpm) delivered to these connections.

For the White City System, peak instantaneous demand was estimated for the upper and lower pressure zones. As stated earlier, in 1995 the upper zone is estimated to have 2,001 ERC's and the lower zone will have 2,366 ERCs. The following equations yield peak instantaneous indoor demand for each zone.

$$Q_d = 10.8 \times (2,001)^{0.64} = 1,400 \text{ gpm (upper zone)}$$

$$Q_d = 10.8 \times (2,366)^{0.64} = 1,559 \text{ gpm (lower zone)}$$

### OUTDOOR/IRRIGATION REQUIREMENTS

Water system distribution for irrigation in the White City area (Zone 4 according to state regulations.) requires 7.92 gpm<sup>10</sup> per irrigated acre during peak instantaneous demand. The following equations yield peak instantaneous demand for irrigation.

$$\text{Upper Zone: } Q_i = 1/8\text{-acre/ERC} \times 2,001 \text{ ERC} \times 7.92 \text{ gpm/Irr. Ac} = 1,981 \text{ gpm}$$

$$\text{Lower Zone } Q_i = 1/6\text{-acre/ERC} \times 2,366 \text{ ERC} \times 7.92 \text{ gpm/Irr. Ac} = 3,123 \text{ gpm}$$

The fire flow requirements used to evaluate the White City service area systems was 1500 gpm for residential areas and 3500 gpm for commercial areas at a minimum of 20 psi.

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<sup>9</sup>Ibid, Page 5-2.

<sup>10</sup>Ibid, Table 5-2, Page 5-12.

### III. WHITE CITY WATER HISTORICAL & STATISTICAL SUMMARY

#### A. HISTORICAL BACKGROUND

The existing White City Water Company system is used to supply water to the residents of White City and a small portion of Sandy City just east of the unincorporated White City limits. The system consists of 10 and 12 inch steel pipes as main feed lines with primarily 6 and 8 inch pipes in the residential areas. White City Water Company has two 500,000 gallon tanks and one 1,000,000 gallon tank located at approximately 1350 East and 9800 South which serve the lower zone. The upper zone is served by a 500,000 gallon tank located at approximately 2100 East and 9800 South, and is in need of replacement within the next five years. The upper zone water storage is supplemented by the Salt Lake County Water Conservancy District (SLCoWCD) storage system. White City Water also has nine wells with eight currently producing.

Growth in the White City Water Company's lower and upper pressure zones has been gradual and consistent over the years as can be seen the Table below:

**TABLE 7**  
**TOTAL WATER CONNECTIONS (Residential & Commercial)**

1995 (Est.)	1990	1989	1988	1987	1986
4,367 ERC's	3,623	3,590	3,576	3,550	3,419
1985	1984	1983	1982	1981	1980
3,360	3,260	3,124	3,039	3,038	3,024

Source: White City Water Company  
1995 Estimate: EWP Engineering

#### B. WHITE CITY WATER COMPANY WATER SOURCES

White City has nine wells from which they obtain their water. The following shows average flow assumed for each well<sup>11</sup>:

**TABLE 8**

Well #1	Well #2	Well #3A	Well #4	Well #5	Well #6	Well #7	Well #8	Well #9	Total
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<sup>11</sup>Source: White City Water Company well production records.

728 gpm	369 gpm	642 gpm	611 gpm	267 gpm	not in production	427 gpm	1,145 gpm	2,250 gpm	6,439 gpm
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Source: White City Water Company

This indicates that the White City system meets source requirements by the State of Utah. However, it should also be noted that the water produced from Well #9 is sent directly to the SLCoWCD through a direct one-way connection. This water diversion reduces total system production to 4189 gpm, (the required minimum was calculated to be 4711 gpm). Because SLCoWCD returns much of this water through four connections to White City and essentially "floats" White City's upper zone storage tank, well production is felt to be adequate. Sandy City also has two connections with White City. Total White City Water Company production is as follows:

**TABLE 9**  
TOTAL WATER PRODUCTION (Acre feet)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	AVG.
JAN	80.12	86.01	85.97	89.37	84.60	91.13	91.29	93.88	92.57	100.44	89.54
FEB	71.19	77.04	80.47	83.00	77.02	81.76	86.26	92.27	92.09	86.35	82.75
MAR	82.99	78.79	82.42	91.37	87.07	105.84	93.11	95.70	106.54	107.16	93.10
APR	179.57	141.31	95.98	98.88	202.70	114.62	242.40	187.82	230.84	222.81	171.69
MAY	151.52	245.26	177.93	334.03	322.89	262.27	368.01	351.27	449.21	380.62	304.30
JUN	428.53	419.58	403.90	385.92	499.32	563.00	584.67	631.66	498.25	527.57	494.24
JUL	564.45	464.39	523.93	476.15	517.03	498.41	570.35	720.31	699.27	658.41	569.27
AUG	534.79	508.38	333.33	402.35	569.63	500.44	521.43	584.77	569.81	621.04	514.60
SEP	315.59	221.44	295.05	267.18	292.38	276.39	403.05	400.3	375.32	419.61	326.63
OCT	111.50	99.55	126.75	108.04	137.61	128.96	236.27	292.60	259.16	223.97	172.44
NOV	79.55	86.07	92.32	80.25	93.78	94.95	107.55	116.21	119.33	114.18	98.42
DEC	81.18	86.07	87.14	83.20	93.07	92.66	93.64	104.68	97.28	115.02	93.39
TOTAL	2,681	2,514	2,385	2,500	2,977	2,810	3,398	3,671	3,590	3,577	3,010

Source: White City Water Company, December 1991

### C. WHITE CITY WATER COMPANY WATER STORAGE FACILITIES

White City Water Company's dependency on the SLCoWCD is primarily for water storage particularly for White City's upper zone. As was discussed in the first section of the report, the White City Water Company's water storage capacity should be increased.

The White City lower zone water storage requirements are 2.42 million gallons (MG). The current storage provided is 2.0 MG or a shortage of 0.42 MG. The upper zone has a storage demand of approximately 2.38 million gallons (MG) with an available existing storage supply

of only 0.5 MG. Through investigating the water storage contractual and operational procedures, it was learned that White City Water Company and SLCoWCD have no formal agreement to provide water storage reserves for White City, particularly for fire protection. The White City Water Company only has an agreement for water purchases. Operationally, SLCoWCD 5.0 MG tank is four feet lower than White City's 0.5 MG reservoir. The SLCoWCD regulates their tank elevation by regulating inflow from its water sources and Sandy City water lines. This is primarily to alter or redirect their water production to meet distribution demand and storage requirements. In the case of fire protection, SLCoWCD stated that they did not guarantee to provide water storage reserves for any client fire needs. This should be cause for concern for White City Water Company, except for the fact that at the present time SLCoWCD has an "in-house" policy to maintain approximately a million and a half gallons in reserve at all times. A minimum fire reserve of 3,500 gallons per hour for three hours is 630,000 gallons for one fire. Changing the unwritten "in-house" operating practices to contractual fire protection agreements is critical.

The available reserves if provided by SLCoWCD should provide completely automated storage reserves by altering water source production output if necessary. The possibility of multiply fires in the SLCoWCD's large service area, including a fire in White City area, should be analyzed. Storage requirements should systematically combine the lower and upper pressure zones in the White City system to reduce the fire storage requirements by one-half (630,000 gallons currently necessary per zone).

At the present time, the only way to utilize the water reserves from the upper zone (SLCoWCD water reserves), is to manually open and close water valves between pressure zones. This practice is not recommended because the system is not manned during the nights, holidays, weekends and periodic other times during the day. Also, having the system operate manually leaves room for human error. By not paying full attention it would be possible on one hand to allow the water levels to drop below minimum water storage requirements for fire protection. On the other hand, if insufficient overflow capacity exists, leaving the valve in the open position too long could result in over pressurizing the storage reservoirs and causing a rupture or total loss of a tank. Current system telemetry is seriously inadequate, and is recommended for improvement by both EWP and White City's Engineering consultant. The primary estimate is approximately \$70,000, but additional communications links with the SLCoWCD facilities could bring this total closer to \$100,000 or more.

#### **D. WHITE CITY WATER COMPANY OPERATIONS and MAINTENANCE**

Only limited operating and maintenance information regarding the White City Water Company System was obtained. In general, the information related to pipe network operations, sizes and deficiencies together with rumored complaints about low irrigation water pressure during the summer months.



The general conditions of the White City system appeared to meet the general needs of its customers in terms of culinary and irrigation water service, except for low pressures during the summer months. However, upon further analysis and data collection, it was determined that the existing system was in serious need of repairs, pipe and storage tank replacements, and general system upgrades. Aging steel pipes, particularly in the lower pressure zone, are in serious need of replacement. Approximately half of the lower zone needs to be replaced and many other system upgrades must be implemented to provide minimum fire protection. In analyzing the system pipe network it was noted that several long dead-end lines exist. Many pipelines have valves that are inoperable, closed, or have been paved over and lost. Still other operational problems exist relating to how or why various portions of the system lack direct connections needed to increase flow and pressure for fire protection.

The most serious operational problems relate to the need for a systematic approach to pipe sizing. Most of the system network lacks a hierarchy of piping including the schedule for pipe replacement. Without a network of large pipes feeding a system of smaller 6 inch pipes, the network will not provide adequate fire protection.

A summary of the system proposed by White City Water Company and the recommended system by EWP is found in the Executive Summary of this report. The maps and cost estimates clearly indicate the serious nature of the problem which has been accumulating over a number of years. As can be seen by this information, a tremendous capital improvement effort will be required to correct the existing deficiencies. Due to the serious nature of the problem, it is recommended that a number of immediate action strategies be implemented in an organized prioritized schedule. This schedule of improvements is presented in Section VI, Recommendations and Conclusions. Improvements are organized into immediate action strategies, typically low cost strategies or critical high priority items, and scheduled long range improvements.

## IV. WATER RATES DISCUSSION and ANALYSIS

### A. WATER RATES: HISTORICAL SUMMARY AND COMPARATIVE ANALYSIS

The following information was collected for comparative analysis of water connection fees and average water consumption rates.

**TABLE 10**  
**SANDY CITY/WHITE CITY WATER COMPANY CONNECTION FEES**

Jurisdiction	3/4"	1"	1-1/2"	2"	3"	4"
Sandy City <sup>1</sup>	\$1,170	\$2,078	\$4,677	\$8,317	\$14,556	\$20,795
Granite <sup>2</sup>	\$1,170	\$2,078	\$4,677	\$8,317	\$14,556	\$20,795
Union Jordan <sup>2</sup>	\$1,626	\$2,888	\$6,502	\$11,561	---	---
Salt Lake County <sup>2</sup>	\$2,129	\$3,782	\$8,612	\$15,137	---	---
White City Water Co. <sup>3</sup>	\$950	\$1,689	\$3,800	\$6,756	\$15,200	\$27,022

Note: connection fees not shown for larger size pipe is based on the proportional flow rate.

1 = Sandy City tariff applied to areas inside Sandy City limits

2 = Sandy City tariff applied to areas outside Sandy City limits (by jurisdiction or water service area)

3 = White City Water Company service area tariff applied to all water users: White City residents and non-residents. Source: White City Water Company, Jan. 13, 1992, LaDell Harston.

Water service rates for various levels of water consumption are shown in Table 11. The average water consumption rate for a typical or average family is approximately 20,000 gallons per month, which includes culinary and irrigation water consumption.

As can be seen in Table 11, the average monthly charge for water consumption of 20,000 gallons is \$15.31 for White City compared to \$16.41 for Sandy City for the average (non-senior) resident. When seniors are included (\$12.60/month charge for 20,000 gallons), Sandy City's average monthly service charge is slightly less or approximately equal to White City's rate.

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**Table 11**

Table 12 provides additional information on water service rates where only a portion of a month is charged.

## **B. HISTORICAL FINANCIAL ANALYSIS**

Over the past ten years or longer, the White City Water Company has been providing comparably priced water service when compared to other systems. Unfortunately, as the system has aged and expanded, system replacement and upgrades have not been budgeted. Profits were not set aside or put into required system improvements. Now the system is essentially faced with tremendous capital expenditures needed in a relatively short period of time. Residents in the system are, and will be, understandably upset and concerned about possibly dramatic water rate increases.

## **C. PROJECTED RATE INCREASES**

This report is not a rate analysis study and does not address the many other related issues regarding the water acquisition and long-term financial planning as they relate to water rates. However, it is possible to state that under the scenario where White City retains ownership, water rates will be highest. This fact will likely be worsened by the timing of the required system improvements and pipe replacements, which cannot be delayed.

It should become clear to anyone reviewing the facts that whether Sandy City or White City Water Company owns the system, rates will need to increase substantially. Based on the large capital cost improvements required, rates will likely surpass the highest rates charged in the valley. As seen in Table 11, White City rates (for an average consumption of 20,000 gallons per month) currently at \$15.31, could approach or exceed the Salt Lake County rate of \$26.13. This assumes that Sandy City acquires the system and is able to spread costs out over a longer period of time. If a shorter pay-off of the needed capital improvements were required, a condition that White City may be financially forced into, water rates could double to \$30 per month or more.

The key to resolving this problem rests not only with developing ideas on how to minimize user costs, but how to implement the needed system replacements and improvements in the shortest time possible to adequately protect residents.

A brief discussion on implementation strategies is presented in the last section of the report on how and what the priorities might be in bringing about the required changes.

**TABLE 12**  
**WATER SERVICE RATES COMPARISON**

Customer Location / Jurisdiction	Type of water user	Basic Charge Rate ( < 6,000 gal./mo.) Cost \$/Day	Additional Charge Rate ( > 6,000 gal./mo.) added Cost \$/1000 gal.
White City	All groups	\$0.26	\$0.39/100 C.F.
Sandy City	Res/Comm.*	\$0.295	\$0.45
Sandy City	Sr. Citizen	\$0.210	\$0.45
Granite	All groups	\$0.295	\$0.54
Union/Jordan	Res/Comm.*	\$0.400	\$0.54
Union/Jordan	Sr. Citizen	\$0.280	\$0.54
Salt Lake County	All groups	\$0.549	\$0.69

\* Res/Comm. includes all other (non - Sr. Citizen) water users including residential/multi-family, schools, commercial, industrial, governmental, medical, etc.

## **V. COMPUTER MODEL ANALYSIS and FINDINGS**

### **A. COMPUTER MODEL BACKGROUND INFORMATION**

The White City water system analysis was performed on a personal computer using the Cybernet program developed by Haestad Methods. The procedures used to define the computer model are:

- Code all elements of the existing system into the model. Each pipe is assigned a number and the length, diameter, and roughness coefficient are entered. Each junction of the pipes is also assigned a number and its elevation is entered into the model. These junctions will be referred to as "nodes" in the model.
- All other elements of the system are coded into the model, including tanks, booster pump stations, and check valves.
- Water demands are entered for node.
- The computer model is then run to find the response of the system.
- The program output includes rate of flow, direction, velocity, and head loss for each pipe. The output also shows junction node pressures, the demand, and elevation used during each run.
- The program summarizes the inflows and outflows of the system and has several options for graphical representation of the run.

The model was calibrated using actual field tests performed by Sandy City Fire Department. They offered information on seven different fire hydrant tests performed in the last five years. Results of the fire hydrant tests and calibration of the model are available upon request.

### **B. IDENTIFICATION OF EXISTING DISTRIBUTION SYSTEM PROBLEM AREAS**

The computer modeling analysis concentrated on specific areas including the following:

1. Residential problem areas
2. School problem areas
3. Commercial, business, and other problem areas
4. Problem areas including dead ends, long pipe reaches, small trunk line distribution, etc.

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Detailed computer simulation information on specific identified problem areas, not contained in this report, is available upon request.

## **VI. RECOMMENDATIONS and CONCLUSIONS**

### **A. RECOMMENDED PLAN**

The findings and conclusion of this report are summarized in the Executive Summary. It was found that the White City Water Company system is in serious need of system wide improvements to provide minimum fire flow protection and general public health for the residents it serves. The system has basically been neglected for a number of years with needed replacements and improvements being postponed to the point that further delays could result in serious fire flow deficiencies and possible loss of property and life. It is also recognized in this study that the financial implications could have significant impacts on the residents who will now be required to pay dramatically higher water rates. The main challenge in this transition period, assuming that all parties recognize the seriousness of the problems and move rapidly to correct the known deficiencies, is to prioritize and cost-effectively minimize system expenditures.

Fire flow protection in the short term period is the key and critical issue at hand. By this, it is meant that low cost capital expenditures with high fire protection benefits should be implemented immediately. Also at the same time, known system deficiencies that could potentially threaten large numbers of lives, particularly at schools or churches should be corrected.

Public safety is also a key short-term issue, particularly when system water distribution pressures drop below the state required minimum of 20 psi. In situations where low pressures exist, near 20 psi, high water demands such as the demands required to control a fire, the possibility of negative pressures exists. With negative pressures, contaminants can enter the system, resulting in potentially serious public health problems. Typically, a wide range of pollution sources is possible under a negative pressures such as: irrigation system cross-connections (garden hoses and sprinkler systems), ground water infiltration, etc. Distribution systems which leak have stagnant dead ends, break frequently, are also potential sources for contamination. All of these potentially hazardous conditions can be corrected but require careful identification and attention to detail.

It is recommended that the White City Water Company be purchased and integrated into the Sandy City system for the following reasons:

1. Fire flow protection and general public health and safety.
2. Overall capital cost savings are greatest under a combined concept where



duplication of effort is eliminated.

3. Improved overall system performance including improved water flow rates and pressures.

## **B. COST ANALYSIS and RECOMMENDATIONS**

The cost information shown in the Executive Summary of this report clearly indicates that under any of the various scenarios, significant capital improvement costs will be required. These capital improvement costs are summarized in Table 1 through 4. The recommended plan, the total acquisition of the White City system by Sandy City, will save approximately \$831,000 over the continued ownership and existence of the White City Water Company. This cost savings increases to \$1.48 million when the required improvements for the "High Upper Pressure Zone" are included.

It is recommended that two water systems be combined together to provide one single cost effective system based upon the capital improvement cost savings alone. It is also assumed that further savings will be realized through increased system operations efficiencies and water acquisitions not requiring pumping. These operational issues and rate projections are not discussed in this report.

## **C. DISCUSSION OF ALTERNATIVES**

Assuming that the White City Water Company system is acquired, it becomes essential to prioritize system deficiencies into implementation plans or strategies. In order to facilitate the implementation procedure, it is recommended that several immediate action improvements be made within the first year. The items recommended include the following:

### **Immediate Action Strategies:**

- Water storage agreements with the Salt Lake County Water Conservancy District should be obtained immediately to guarantee fire flow protection, or else water supply connections from Sandy City to White City Water Company storage reservoirs must be made immediately.
- Telemetry improvements to prevent possible fires during evenings, weekends, holidays and periods when the system is unattended. Telemetry improvements are also necessary

to allow various other recommended improvements. These improvements, discussed earlier in the report would allow the connection of the upper zone to the lower pressure zone. Without this improvement or connection, additional costs will be required for additional upper zone water storage.

- **School related water system improvements** are high priority improvements that should be made. For many of the schools, improved fire protection can be provided merely by connecting the existing White City lines to Sandy City's larger diameter pipes or installing fire hydrants on the Sandy system in front of the schools. These schools include: Eastmont Middle School (immediate need), and Edgemont Elementary (only moderate need). In the case of Willow Canyon Elementary and Alta View Elementary, fire flow improvements are required for minimum fire protection. In the case of Willow Canyon Elementary approximately 870 feet of new 10 inch pipe must be installed. At Alta View, the reach of pipe is very long and cost prohibitive. For the short term period, only cross-connections with the Sandy City system are affordable. These connections will help to resolve the problem, but under certain conditions (power failure area-wide in both the Sandy and White City system areas), problems still exist. The line improvements (establishing a new main trunk line in the area) is recommended in short term period, one to five years, but at the time other line replacements are made. These section of line should have priority over other residential improvements.
- **Water system improvements to the Canyon Shopping Center** are required to provide adequate fire protection which is currently under served. The improvements should be accomplished by installing fire hydrants on the Sandy City 20 inch line on 1300 East. Negotiations on payment will be required, but the shopping center would be well advised pay for fire hydrant protection if offered by Sandy City whether or not the White City System is acquired by Sandy City.
- **Key connections from the Sandy City to the White City system** should be made at several upper and lower pressure zone locations. These areas (discussed earlier in the report) include making connections to the following:
  - Provide a connection to the northeast top portion of the upper pressure zone where fire protection is inadequate.
  - Provide a connection in the lower pressure zone to the area to the southwest of the intersection of 9800 South and 1300 East. This area is a known problem area which during the summer months is operated off the high pressure zone.

- A connection to the White City system near the Canyon Shopping Center should be made.
- A connection on 1300 East on the south side of Dry Creek helping to reduce pipe friction pressure losses to Alta Elementary should be made.
- **Dead-end lines** and various closed, broken or lost valves/connections should be corrected. These connections are readily seen on the computer network map used in modeling the White City network (no copy of the map is contained in the report).
- **Improvements to churches** should also be made. Many of the improvements can be accomplished by short simple cross-connections.

#### **SHORT-TERM SOLUTIONS**

Short-term capital improvements would typically occur in the two to five year period. These types of improvements, while important, are not normally life threatening and can be completed when time permits. Any life threatening system deficiencies should be corrected by the end of the first year or shortly thereafter. In most cases, short-term improvements represent projects such as the replacement of aging pipes, replacing or adding water storage facilities, etc. These types of improvements are as follows:

- **Additional school improvements** not initially installed in the first year should be implemented. These improvements should include Alta View Elementary school supply line upgrades.
- **Replacement of aging pipes.**
- **Highland Drive water line improvement** are necessary to solve the fire protection needs of the upper zone.
- **Residential improvements** not completed in the first year or non-critical to the system.
- **Replacement or additional water storage facilities.** The upper pressure zone has the greatest need for additional water storage. However, the location of future water tanks should be closely coordinated with the Sandy City water storage plans. The replacement of the existing White City 0.5 MG reservoir located on 9800 South near 20th East needs replacement within the next five years. The replacement of this reservoir is intended to

supplement water supplies in the lower zone. The actual location of this tank could be in the upper zone since the upper and lower zones will be interconnected.

- **Develop a coordinated network.** Many of the problems in the lower pressure zone, the area below 1300 East, are caused by a lack of a systematic approach. A network of trunks lines feeding into a series of branch lines is required. By developing this type of system the problems associated with pipe friction pressure losses from smaller pipes will be eliminated.

### **LONG-TERM SOLUTIONS:**

The recommended improvements in this time period would occur normally after five years. These improvements would be designed to integrate the White City and Sandy City systems into the most efficient operational and cost-effective systems. Many additional connections not recommended in the proposed cost analysis would be made to improve the overall system performance, particularly on main corridors such as 700 East, 1300 East, 9000 South, 9800 South, etc. These improvements include:

- **Improvements to help control or fight fires along Dry Creek.** While there are not many good alternatives to correct the known problems with fighting fires in this area, it will be helpful to install fire hydrants wherever possible. Additional access is also a key issue in effectively fighting a fire in this location. Solutions to fires in Dry Creek warrant further research and investigation, which is beyond the scope of this study. A combined solution which includes participation from Salt Lake County, Bell Canyon, White City and Sandy City is required.
- **Develop a system hierarchy** of interconnected pipes to the main Sandy City lines on 700 East, 1300 East, 2000 East, 9000 South, 9800 South, etc. These types of improvements will allow better overall fire protection and increase water pressure, particularly during summer outdoor irrigation periods.
- **Complete major trunk lines.** These lines should include the extension of the 2000 East 16 inch pipeline to the north beyond 9000 South and to the south beyond 10600 South. Also a future major east/west connection along 10600 South is needed. A major new pipeline in this location should be coordinated with plans for the Bell Canyon system.

# **APPENDIX "A"**

## **White City Water Detailed Cost Information Scenario 2**

# **APPENDIX "B"**

## **White City Water Detailed Cost Information Scenario 3**

**TABLE 11**  
**WATER CONSUMPTION RATE COMPARISONS**

<b>Jurisdiction</b>	<b>User Category</b>	<b>Basic Rate (6000 gallon)</b>	<b>Monthly water service charges for various water consumption rates</b>				
			<b>Added Cost \$/1000 gal</b>	<b>10,000 gallons</b>	<b>15,000 gallons</b>	<b>20,000 gallons</b>	<b>25,000 gallons</b>
<b>Sandy City</b>	<b>Resid./Comm.</b>	<b>\$8.85</b>	<b>\$0.54</b>	<b>\$11.01</b>	<b>\$13.71</b>	<b>\$16.41</b>	<b>\$19.11</b>
<b>Sandy City</b>	<b>Sr. Citizen</b>	<b>\$6.30</b>	<b>\$0.45</b>	<b>\$8.10</b>	<b>\$10.35</b>	<b>\$12.60</b>	<b>\$14.85</b>
<b>Sandy City<sup>12</sup></b>	<b>County Resid.</b>	<b>\$16.47</b>	<b>\$0.69</b>	<b>\$19.23</b>	<b>\$22.68</b>	<b>\$26.13</b>	<b>\$29.58</b>
<b>White City Water Company<sup>13</sup></b>	<b>All groups</b>	<b>\$8.01</b> <b>(\$8.00/800 c.f.)</b> <b>(\$8.00/5984 gal.)</b>	<b>\$0.5214</b> <b>(\$0.39/100c.f.)</b> <b>(\$0.52/1000gal.)</b>	<b>\$10.09</b>	<b>\$12.70</b>	<b>\$15.31</b>	<b>\$17.92</b>
<b>Salt Lake City</b>	<b>Residents</b>	<b>\$6.45</b> <b>(\$6.45/1000c.f.)</b>	<b>\$0.5748</b> <b>(\$0.43/100 c.f.)</b> <b>(0.57/1000gal.)</b>	<b>\$7.90</b>	<b>\$10.77</b>	<b>\$13.65</b>	<b>\$16.52</b>
<b>Salt Lake City</b>	<b>Non-Residents</b>	<b>\$8.95</b> <b>(\$8.95/1000c.f.)</b>	<b>\$0.8556</b> <b>(\$0.64/100 c.f.)</b> <b>(\$0.86/1000gal.)</b>	<b>\$11.11</b>	<b>\$15.39</b>	<b>\$19.67</b>	<b>\$23.95</b>

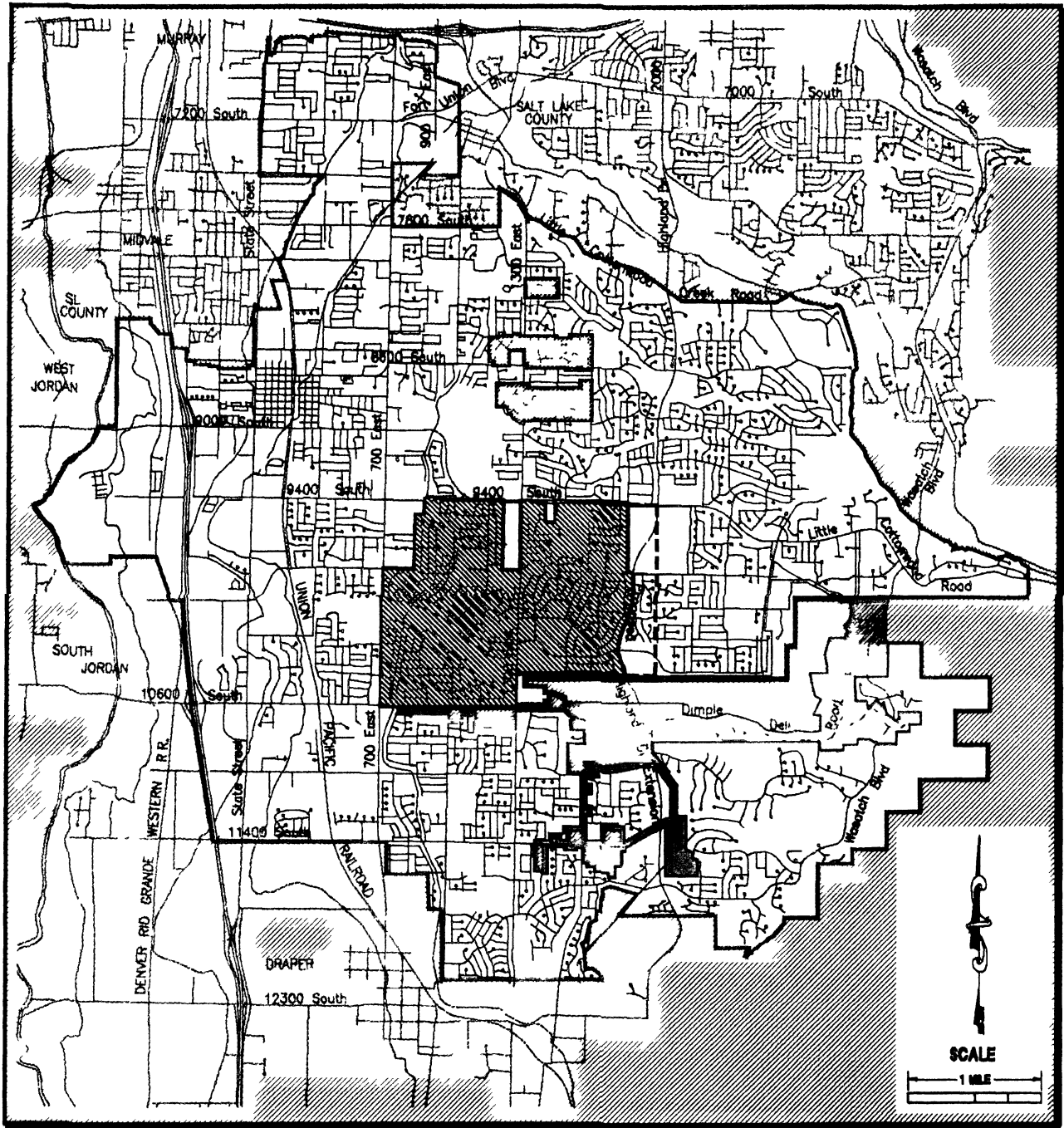
<sup>1</sup>Salt Lake County Residents served by Sandy City Water Department

<sup>2</sup>White City Water Company includes Sandy City and unincorporated White City residents.





Tab 3



### LEGEND OF WATER RETAIL PROVIDERS

- |                                                               |                                                                |                                                            |
|---------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|
| SANDY CITY CORPORATE AREA                                     | SANDY RESIDENTS SERVED BY BELL CANYON WATER COMPANY            | SANDY CITY WATER SERVICE BOUNDARY                          |
| SANDY RESIDENTS SERVED BY WHITE CITY WATER COMPANY            | SALT LAKE COUNTY RESIDENTS SERVED BY BELL CANYON WATER COMPANY | WHITE CITY WATER CO. - CURRENT SERVICE AREA                |
| SALT LAKE COUNTY RESIDENTS SERVED BY WHITE CITY WATER COMPANY | SALT LAKE COUNTY WATER CONSERVANCY DISTRICT SERVICE AREA       | WHITE CITY WATER CO. - CERTIFICATED SERVICE AREA           |
|                                                               | OTHER WATER RETAILERS OUTSIDE SANDY CITY SERVICE AREA          | BELL CANYON WATER CO. - SERVICE AREA                       |
|                                                               |                                                                | SALT LAKE COUNTY WATER CONSERVANCY DISTRICT - SERVICE AREA |
|                                                               |                                                                | DIMPLE DELL REGIONAL PARK                                  |

JANUARY 29, 1993

**EXHIBIT**



**ECKHOFF WATSON AND PREATOR ENGINEERING**

ENGINEERS PLANNERS SURVEYORS

SALT LAKE CITY

**PIPE NETWORK MAP OF WATER RETAILERS  
IN THE SANDY CITY VICINITY**

Tab D

TESTIMONY OF MAYOR LAWRENCE SMITH

1 Q. Please state your name and address.

2 A. My name is Lawrence Smith. My business address is 440 East  
3 8680 South, Sandy, Utah 84070

4 Q. What is your present position?

5 A. I am currently the Mayor of Sandy City. I was elected to a  
6 second four-year term beginning in January, 1990.

7 Q. Are you generally familiar with Sandy City's agreement to  
8 purchase the shares of the White City Water Company?

9 A. Yes. I have participated in the negotiation of that purchase  
10 from its inception, in close coordination with Darrel Scow,  
11 the Director of Public Works, as well as the Sandy City  
12 Council.

13 Q. Could you generally state Sandy City's purpose in acquiring  
14 the White City Water Company?

15 A. Sandy City believes that the acquisition of the White City  
16 Water Company is essential to the long-term adequate and safe  
17 supply of water to the residents of Sandy City served by the  
18 White City Water Company. The more Sandy City has looked into  
19 the White City Water Company, and the deficiencies testified  
20 to by Mr. McFarland, Mr. Scow and Mr. Alsop of the White City  
21 Water Company, the more I have become convinced that the  
22 purchase is essential for the health, welfare and safety of  
23 Sandy City, including both Sandy City and non-Sandy City

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18 White City Water Company. The more Sandy City has looked into  
19 the White City Water Company, and the deficiencies testified  
20 to by Mr. McFarland, Mr. Scow and Mr. Alsup of the White City  
21 Water Company, the more I have become convinced that the  
22 purchase is essential for the health, welfare and safety of  
23 Sandy City, including both Sandy City and non-Sandy City

1 residents served by of the White City Water Company. As has  
2 been detailed in Mr. McFarland's testimony, there are  
3 substantial fire protection and capacity concerns with the  
4 White City Water Company system affecting future development  
5 within Sandy City limits, as well as current residents of  
6 Sandy City served by the White City Water Company system.

7 Q. Are those safety concerns the only ones which Sandy City has?

8 A. No. Sandy City is also committed to planning for the long-  
9 term, continued growth of Sandy City. As Mr. Scow has also  
10 indicated, Sandy City is one of the fastest growing  
11 communities in the state of Utah. Over the last ten years,  
12 during six of which I have been Mayor, the annual growth rate  
13 within Sandy City limits has the highest in Salt Lake County.  
14 In addition, in order to assure the rational, long-term growth  
15 of the area, Sandy City has accepted a number of annexation  
16 petitions from areas surrounding Sandy City. Sandy City  
17 believes that the municipal type services it provides, with  
18 water service being one of the most important, are essential  
19 in order to allow such growth to occur. Sandy City believes  
20 it must plan for the long-term, least cost means of supplying  
21 water to its residents, and likely future residents. This  
22 includes those Sandy City residents served by the White City  
23 Water Company.

1     A.   Does this mean that Sandy City has plans to annex the  
2           unincorporated area currently served by the White City Water  
3           Company if it acquires the system?

4     Q.   Absolutely not.  As I have stated on a number of occasions,  
5           the citizens of that unincorporated area will decide when, if  
6           ever, they want to become a part of Sandy City.  Sandy City  
7           has no current plan to annex that area.  Sandy City is  
8           committed to providing the most efficient, economical water  
9           service possible to the unincorporated area customers,  
10          regardless of what position they may take with respect to  
11          annexation.

12    Q.   Will you generally describe Sandy City's philosophy with  
13          respect to rates for water service?

14    A.   Mr. Scow has generally set forth the manner in which Sandy  
15          City rates are set.  As Mayor, I am personally committed to  
16          providing adequate, long-term supplies of water to the  
17          citizens of Sandy City.  On occasion, it is most logical to  
18          acquire systems such as the White City Water Company in order  
19          to provide for the most efficient, long-term water service to  
20          Sandy City residents.  Generally, Sandy City has a rate  
21          differential for non-city residents to reflect the fact that  
22          those individuals are not residents of Sandy City and have not  
23          made the same contribution to Sandy City Water Department as  
24          have residents.  The current residents are effectively the  
25          owners of the system and are billed at a lesser rate as a

1           consequence. As Mr. Scow has stated, that rate differential  
2           is justified.