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July 14, 2008

Ray Davis, P.E.  
Nevada Department of Conservation and Natural Resources  
Division of Water Resources  
901 S. Stewart Street, Suite 2002  
Carson City, Nevada 89701

Re: Douglas County Utilities (DCU) Water Conservation Plan

Dear Ray:

I have revised the DCU Conservation plan, addressing those issues that we discussed by phone. The revisions include the following:

1. Pg. 1, Section 1.2 – Reduction in Lawn Size Added to this Section.
2. Pg. 22, Section 3.2.1 – Additional rate analysis information.
3. Pg. 23, Section 3.3.2 – Projected monetary value of conservation.
4. Pg. 26, Section 4.2.2 and Pg. 33, Section 6.8 – Leak reduction information.
5. Pg. 28, Section 4.3.2 – Estimated amount saved by mandatory measures.
6. Pg. 29 - Drought Plan moved from Appendix and became Section 5.

We submit the plan for your approval. Please let me know if you have any questions.

Best Regards,

A handwritten signature in cursive script that reads "Danny Sommers".

Danny Sommers  
Farr West Engineering

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**DOUGLAS COUNTY UTILITIES**  
**WATER CONSERVATION PLAN**  
**July, 2008**



**OWNER:**

Douglas County  
1594 Esmeralda Ave, Room 202  
Minden, Nevada  
(775) 782-6235

**ENGINEER:**

Farr West Engineering  
5442 Longley Lane, Suite B.  
Reno, Nevada 89511  
(775) 851-4788

This Plan is mandated by NRS 540.131 and is compliant with NRS sections 540.121 through 540.151

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Douglas County Utilities (DCU) provides potable water to customers within an overall service area that includes East Valley, Genoa Lakes, Sunrise Estates, Fairgrounds, China Springs, Jobs Peak, Sheridan Acres, Skyland/Cave Rock, Uppaway and Zephyr Cove. This service area is divided into one district and seven sub-districts which operate as essentially separate systems. These systems are described as follows:

District or Sub-District	District or Sub-District Service Area
West Valley Water District	Walley's Genoa Lakes/Sierra Shadows Mountain Meadows Montaña
Tahoe Sub-Water District	Zephyr Cove Skyland/Cave Rock ✓ Uppaway
East Valley Sub-Water District	Airport Mountain View East Valley
Foothill Sub-Water District	Sheridan Acres Jobs Peak
China Springs Sub-Water District	China Springs ✓
North County Sub-Water District	Wells #1 and #2
Sunrise Estates Sub-Water District	Wells #1 and #2
Fairgrounds Sub-Water District	Well #1

According to U.S. Census data, the population of Douglas County grew at an approximate average rate of 2.4 % per year between 2000 and 2005. In addition to population there has been substantial commercial growth. This growth has required the construction of new water facilities as well the improvement of existing ones.

All but the Tahoe system are metered and each has a distinct customer use profile. For example the East Valley has the highest water use of the six systems with most of it being residential. In fact residential use in the East Valley is almost five times higher than that of the West Valley, the system with the next highest residential use. This is because the East Valley has 1,472 residential connections and West Valley only 233. The North County system has no residential customers while the Sunrise Estates system has no commercial customers. Because of these system differences, each system requires its own unique approach to conservation.

This Plan includes the following elements:

- Conservation goals
- Water Rights quantities
- Existing and planned conservation measures and incentives
- DCU use profile
- Conservation educational materials
- Regulatory Documents
- Drought plan

This plan was designed specifically for DCU and its customers and is compliant with Nevada Revised Statutes (NRS) sections 540.121 through 540.151. This includes Senate Bill 62

(passed in the 2005 Legislative Session) which added NRS 540.131.4 c to the existing statute. It also includes NRS 540 AB 331. Note that SB 62 wording is already included in the following statutes.

## WATER CONSERVATION

**NRS 540.121 "Supplier of water" defined.** As used in [NRS 540.121](#) to [540.151](#), inclusive, "supplier of water" includes, but is not limited to:

1. Any county, city, town, local improvement district, general improvement district and water conservancy district;

2. Any water district, water system, water project or water planning and advisory board created by a special act of the Legislature; and

3. Any other public or private entity,

↪ that supplies water for municipal, industrial or domestic purposes. The term does not include a public utility required to adopt a plan of water conservation pursuant to [NRS 704.662](#).

(Added to NRS by 1991, 520)

**NRS 540.131 Plan of water conservation: Procedure for adoption and updating of plan; review of plan by Section; joint plans permitted by certain suppliers; duties of local governing body.**

1. Except as otherwise provided in subsection 5, each supplier of water which supplies water for municipal, industrial or domestic purposes shall, on or before July 1, 1992, adopt a plan of water conservation based on the climate and the living conditions of its service area in accordance with the provisions of [NRS 540.141](#), and shall update the plan pursuant to paragraph (c) of subsection 4. The provisions of the plan must apply only to the supplier's property and its customers. The supplier of water shall submit the plan to the Section for review by the Section pursuant to subsection 3.

2. As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person, including, but not limited to, any private or public entity that supplies water for municipal, industrial or domestic purposes, to submit written views and recommendations on the plan.

3. The plan must be reviewed by the Section within 30 days after its submission and approved for compliance with this section before it is adopted by the supplier of water.

4. The plan:

(a) Must be available for inspection by members of the public during office hours at the offices of the supplier of water;

(b) May be revised from time to time to reflect the changing needs and conditions of the service area. Each such revision must be made available for inspection by members of the public; and

(c) Must be updated every 5 years and comply with the requirements of this section and [NRS 540.141](#).

5. Suppliers of water:

(a) Who are required to adopt a plan of water conservation pursuant to this section; and

(b) Whose service areas are located in a common geographical area,

↪ may adopt joint plans of water conservation based on the climate and living conditions of that common geographical area. Such a plan must comply with the requirements of this section and [NRS 540.141](#).

6. The board of county commissioners of a county, the governing body of a city and the town board or board of county commissioners having jurisdiction of the affairs of a town shall:

(a) Adopt any ordinances necessary to carry out a plan of conservation adopted pursuant to this section which applies to property within its jurisdiction;

(b) Establish a schedule of fines for the violation of any ordinances adopted pursuant to this subsection; and

(c) Hire such employees as it deems necessary to enforce the provisions of any ordinances it adopts pursuant to this subsection.

(Added to NRS by 1991, 520; A [2005, 2570](#))

**NRS 540.141 Required provisions of plan or joint plan of water conservation; review by Section.**

1. A plan or joint plan of water conservation submitted to the Section for review must include provisions relating to:

(a) Methods of public education to:

(1) Increase public awareness of the limited supply of water in this State and the need to conserve water.

(2) Encourage reduction in the size of lawns and encourage the use of plants that are adapted to arid and semiarid climates.

(b) Specific conservation measures required to meet the needs of the service area, including, but not limited to, any conservation measures required by law.

(c) The management of water to:

(1) Identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies; and

(2) Where applicable, increase the reuse of effluent.

(d) A contingency plan for drought conditions that ensures a supply of potable water.

(e) A schedule for carrying out the plan.

(f) Measures to evaluate the effectiveness of the plan.

2. A plan or joint plan submitted for review must be accompanied by an analysis of the feasibility of charging variable rates for the use of water to encourage the conservation of water.

3. The Section shall review any plan or joint plan submitted to it within 30 days after its submission and approve the plan if it is based on the climate and living conditions of the service area and complies with the requirements of this section.

4. The Chief may exempt wholesale water purveyors from the provisions of this section which do not reasonably apply to wholesale supply.

(Added to NRS by 1991, 521; A [2005, 2571](#))

**NRS 540.151 Supplier of water required to adopt plan to provide certain incentives; procedure for adoption of plan; adoption of joint plans permitted.**

1. Except as otherwise provided in subsection 5, each supplier of water which supplies water for municipal, industrial or domestic purposes shall adopt a plan to provide incentives:

(a) To encourage water conservation in its service area;

(b) To retrofit existing structures with plumbing fixtures designed to conserve the use of water; and

(c) For the installation of landscaping that uses a minimal amount of water.

↪ The supplier of water may request assistance from the Section to develop its plan.

2. As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person to submit written views and recommendations on the plan.

3. The supplier of water shall file a copy of the plan with the Section for informational purposes.

4. The plan:

(a) Must be available for inspection by members of the public during office hours at the offices of the supplier of water; and

(b) May be revised from time to time to reflect the changing needs and conditions of the service area. Each such revision must be made available for inspection by members of the public.

5. Suppliers of water:

(a) Who are required to adopt a plan for incentives pursuant to this section; and

(b) Whose service areas are located in a common geographical area,

↪ may adopt joint plans.

(Added to NRS by 1991, 522; A [2005, 2571](#))

**The following are the AB 331 amended Statutes :**

NRS 540.131 is hereby amended to read as follows:

1. Except as otherwise provided in subsection 5, each supplier of water which supplies water for municipal, industrial or domestic purposes shall, on or before July 1, 1992, adopt a plan of water conservation based on the climate and the living conditions of its service area in accordance with the provisions of NRS 540.141, and shall update the plan pursuant to paragraph (c) of subsection 4. The provisions of the plan must apply only to the supplier's property and its customers. The supplier of water shall submit the plan to the Section for review by the Section pursuant to subsection 3.

2. As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person, including, but not limited to, any private or public entity that supplies water for municipal, industrial or domestic purposes, to submit written views and recommendations on the plan.

3. The plan must be reviewed by the Section within 30 days after its submission and approved for compliance with this section *and NRS 540.141* before it is adopted by the supplier of water.

4. The plan:

(a) Must be available for inspection by members of the public during office hours at the offices of the supplier of water;

- (b) May be revised from time to time to reflect the changing needs and conditions of the service area. Each such revision must be made available for inspection by members of the public; and
- (c) Must be updated every 5 years and comply with the requirements of this section and NRS 540.141.

5. Suppliers of water:

- (a) Who are required to adopt a plan of water conservation pursuant to this section; and
- (b) Whose service areas are located in a common geographical area, may adopt joint plans of water conservation based on the climate and living conditions of that common geographical area. Such a plan must comply with the requirements of this section and NRS 540.141.

6. The board of county commissioners of a county, the governing body of a city and the town board or board of county commissioners having jurisdiction of the affairs of a town shall:

- (a) Adopt any ordinances necessary to carry out a plan of conservation adopted pursuant to this section which applies to property within its jurisdiction;
- (b) Establish a schedule of fines for the violation of any ordinances adopted pursuant to this subsection; and
- (c) Hire such employees as it deems necessary to enforce the provisions of any ordinances it adopts pursuant to this subsection.

NRS 540.141 is hereby amended to read as follows:

1. A plan or joint plan of water conservation submitted to the Section for review must include provisions relating to:

(a) Methods of public education to:

- (1) Increase public awareness of the limited supply of water in this State and the need to conserve water.
- (2) Encourage reduction in the size of lawns and encourage the use of plants that are adapted to arid and semiarid climates.

(b) Specific conservation measures required to meet the needs of the service area, including, but not limited to, any conservation measures required by law.

(c) The management of water to:

- (1) Identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies; and

(2) Where applicable, increase the reuse of effluent.

(d) A contingency plan for drought conditions that ensures a supply of potable water.

(e) A schedule for carrying out the plan **[.] or joint plan.**

(f) Measures to evaluate the effectiveness of the plan **[.] or joint plan.**

***(g) For each conservation measure specified in the plan or joint plan, an estimate of the amount of water that will be conserved each year as a result of the adoption of the plan or joint plan, stated in terms of gallons of water per person per day.***

2. A plan or joint plan submitted for review must be accompanied by an analysis of **[the]** :

***(a) The feasibility of charging variable rates for the use of water to encourage the conservation of water.***

***(b) How the rates that are proposed to be charged for the use of water in the plan or joint plan will maximize water conservation, including, without limitation, an estimate of the manner in which the rates will affect consumption of water.***

3. The Section shall review any plan or joint plan submitted to it within 30 days after its submission and approve the plan if it is based on the climate and living conditions of the service area and complies with the requirements of this section.

4. The Chief may exempt wholesale water purveyors from the provisions of this section which do not reasonably apply to wholesale supply.

***5. To the extent practicable, the State Engineer shall provide on his Internet website a link to the plans and joint plans that are submitted for review. In carrying out the provisions of this subsection, the State Engineer is not responsible for ensuring, and is not liable for failing to ensure, that the plans and joint plans which are provided on his Internet website are accurate and current.***

The plan is available for public inspection at the following location:

**Douglas County  
1594 Esmeralda Ave, Room 202  
Minden, Nevada  
(775) 782-6235**

Public comments about this plan are encouraged. Written comments may be sent to the address above.

## SECTION 1 – CONSERVATION GOALS

---

The following are the DCU conservation goals. Some of these goals involve ongoing efforts and others are one-time projects that will improve DCU's ability to manage available water. Project related goals will be revised or replaced by new goals as the conservation plan is periodically reviewed.

### 1.1 Plan Revision

This Conservation plan will be reviewed and revised as needed every five (5) years. Revisions could include updated system profile data and charts, new conservation goals, well information, rate changes and any other pertinent conservation related changes that have occurred during the previous five years.

### 1.2 Reduction in Lawn Size

Although DCU has no authority to institute codes and/or ordinances, one of the primary goals of this plan is to encourage a reduction in lawn size. Currently there is no County ordinance that limits lawn size; however there are existing regulations (Consolidated Development Code, Title 20.694) that govern where turf can be installed. For example turf is not allowed in any space measuring less than four feet in width or length. Turf is also not allowed in areas with a slope greater than 20 percent (1:5). Suggestions regarding lawn size and irrigation can be found in Appendices A and B.

### 1.3 Effluent Use

Goal 5.15, Policy 5.15.02 in Chapter 5 of the Douglas County Master Plan states:

*"Treated effluent will be used to replace supplemental and non-supplemental groundwater pumped for irrigation purposes where feasible."*

DCU is currently working on system improvements that will allow for effluent storage. The treated effluent will be used for agricultural applications within the Minden/Gardnerville area. The project is expected to be completed within 2007.

### 1.4 New Conservation Programs

Goal 5.14, Policy 5.14.02 in Chapter 5 of the Douglas County Master Plan states:

*"Water conservation programs should be developed and instituted as necessary to reduce municipal demands."*

### 1.5 Conservation Plan Implementation Schedule

The conservation measures and incentives in this plan will be implemented according to the following schedule (see section 5 for detailed descriptions of incentives and measures included in the schedule):

**Table 1.1**

Plan Implementation Schedule

	2008	2009	2010
<b>Incentives</b>			
Conservation Education	Implement		
Water Ordinance amended		Implement	
<b>Measures</b>			
Effluent Use	Implement		
Creation of Conservation Budget		Implement	
Appointment of Conservation Specialist		Implement	
Formation of Conservation Committee		Implement	

The annual production audit will help determine if the schedule needs to be adjusted to accommodate the implementation of new measures or incentives or the discontinuation of old ones.

**1.6 Plan Review and Metrics**

General benchmarks have been established by which the effectiveness of this conservation plan may be measured. Appendix H contains these benchmarks taken from the Environmental Protection Agency (EPA) website for estimating residential water use. These benchmarks were used in Section 2.5 to determine the ranges of conservation expected for estimated plan participation. Once the plan has been implemented, the effectiveness of measures and incentives can be measured by comparing the 2005 gallon per capita per day (gpcd) usage (230 gpcd) with up-to-date usage. This will require that the latest metered residential use be divided by up-to-date persons per household census data. Section 2.5 discusses potential conservation amounts.

END OF SECTION

## SECTION 2 – WATER USE PROFILE AND FORECAST

This section outlines a profile of water production and use as well as a quantitative description of the MVWD water system that will include the following:

- Water rights information
- Existing supply sources and their production
- System water use profile with customer classifications and unaccounted for water
- Water use forecast using projected population growth

The purpose of this section is to compare water sources, with demand and establish a basis for conservation measures and incentives.

### 2.1 Water Rights

2.1.1 Ground Water Rights. Table 3.3 is a summary of current ground water right amounts held by DCU. The information in this table comes from the Water Rights Drawings created by DCU. Since the number of permits and other information is so extensive, it is not included here.

**TABLE 2.1**

Summary of DCU Ground Water Rights

System	Duty (AFA)
Cave Rock / Skyland	451.188
China Springs	58.54
East Valley	3,081.483
Fairgrounds	37.726
Fish Springs Fire Station	2.24
Genoa	429.351
Jobs Peak Ranch	147.840
Lampe Park	96.080
Mountain Meadows	540.300
North County	362.063
Sheridan Acres	122.112
Sierra Country Estates	29.12
Sunrise Estates	51.960
Topaz Lake Park	24.496
Uppaway	46.965
W R Technology Park	102.066
Walley's Hot Springs	649.705
Zephyr	271.340
<b>Total</b>	<b>6,504.576</b>

At this time the water rights listed above meet the demand of DCU customers. For example the total water rights for the East Valley system are 3,081.483 AFA. In 2005 the East Valley system consumption, including unaccounted-for water, was 1,131.85 AFA.

## 2.2 Supply Sources, Production and Storage

### Supply Sources and Production

Table 2.2 shows 2005 average monthly demand and peak demand for active wells in the DCU system.

**TABLE 2.2**

Monthly Well Pumping Summary for DCU 2005

<b>WEST VALLEY SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Sierra Shadows	842,147	2,667,000	February
Genoa Lakes #1	276,750	1,184,000	December
Genoa Lakes #2	2,319,500	7,785,000	May
Walley's #2	5,925,167	17,671,000	August
Montaña #1	Not used in 2005	-	-
Montaña #2	Not used in 2005	-	-
<b>EAST VALLEY SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Airport Well #1	2,275,417	9,261,000	July
South Airport Well	22,350,167	50,092,000	August
North Clapham	5,598,083	7,965,000	November
Heybourne	356,750	2,205,000	July
NVWWTP*	3,667	9,000	Oct, Nov
*This well only supplies non-potable water for the wastewater treatment plant.			
<b>SUNRISE ESTATES SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Sunrise Estates #1	5,583	38,000	March
Sunrise Estates #2	1,488,667	7,586,000	April
<b>LAKE TAHOE SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Lake Tahoe	6,689,500	12,385,000	July

**Section 2 – Water Use Profile and Forecast**

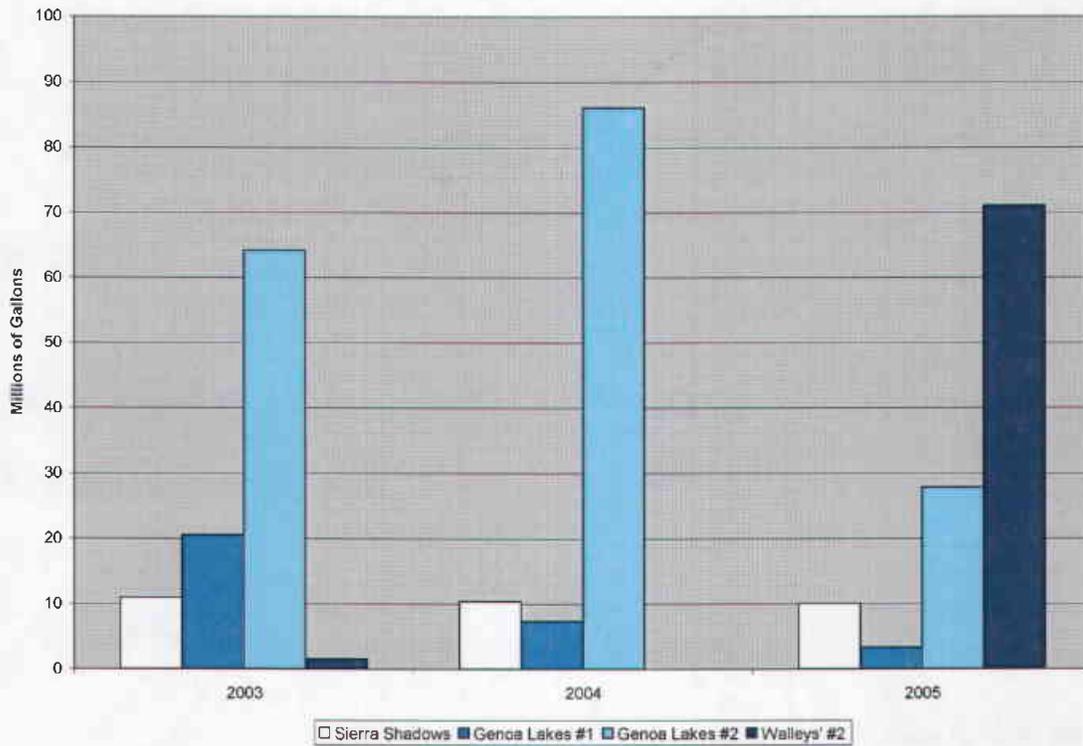
<b>NORTH COUNTY SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
North County #1	1,679,833	2,927,000	July
North County #2	177,417	1,237,000	December
Topsy Fill Station	4,083	21,000	November
<b>FOOTHILL SYSTEM</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Sheridan #2	4,412,467	22,977,000	February
Jobs Peak #1	2,124,333	6,145,000	August
Jobs Peak #2	111,750	1,333,000	May
<b>FAIRGROUNDS WELL</b>			
<b>Name</b>	<b>Average Monthly Demand (gal)</b>	<b>Peak Demand (gal)</b>	<b>Month of Peak Demand</b>
Fairgrounds #1	315,250	708,000	July

The East Valley wells shown in Table 2.1 have the highest production amounts because they serve the area with the greatest concentration of residential users in the DCU system. The South Airport well has the highest production of any DCU well with an average monthly demand of 22 million gallons per month, with a peak demand of 50 million gallons (2005).

Figures 2.1 through 2.7 show the annual contributions of wells in each of the sub-systems for the years 2003 through 2005.

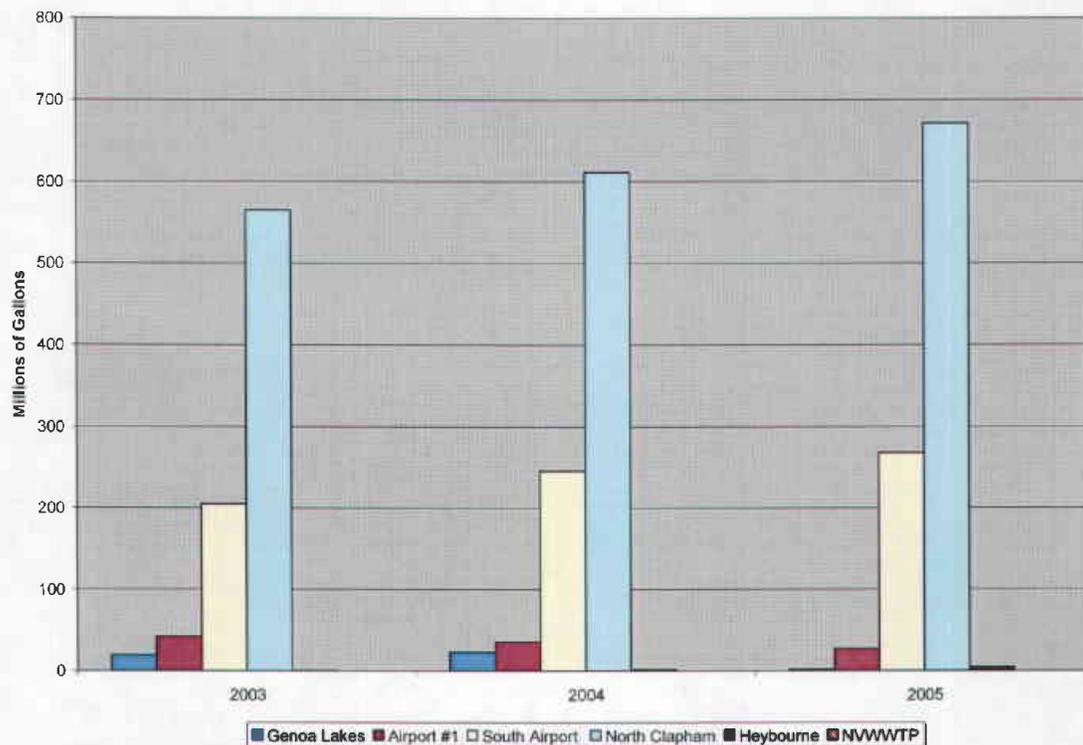
**FIGURE 2.1**

Annual Well Contributions – West Valley 2003 - 2005



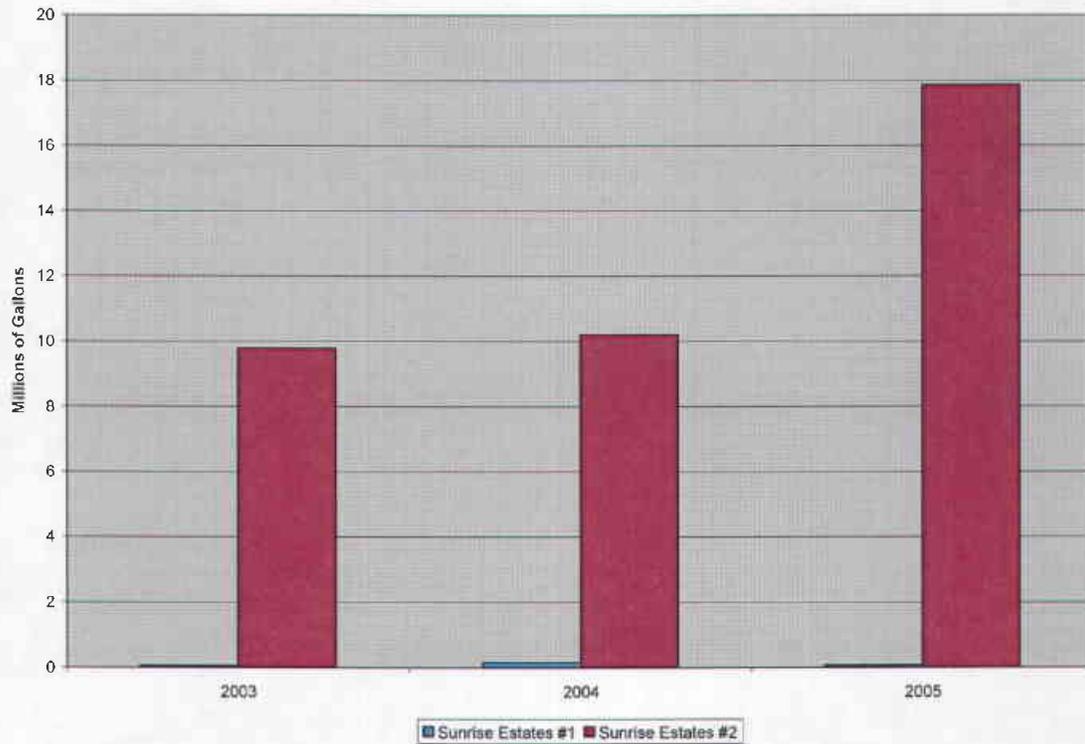
**FIGURE 2.2**

Annual Well Contributions – East Valley 2003 – 2005



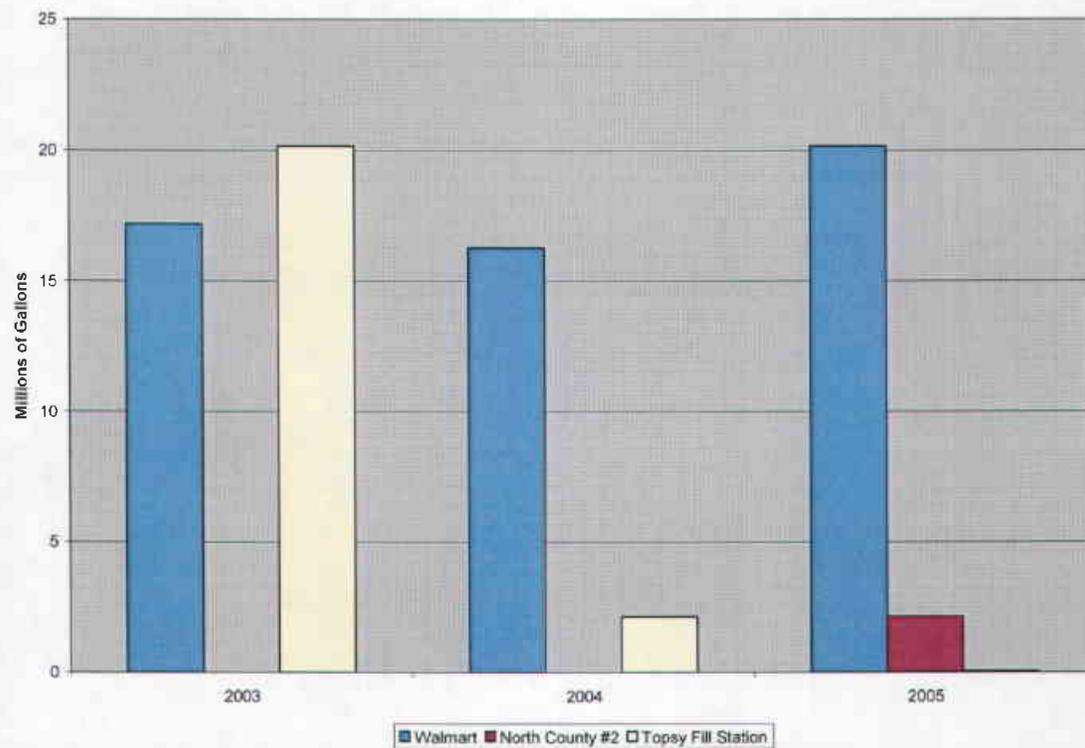
**FIGURE 2.3**

Annual Well Contributions – Sunrise Estates 2003 – 2005



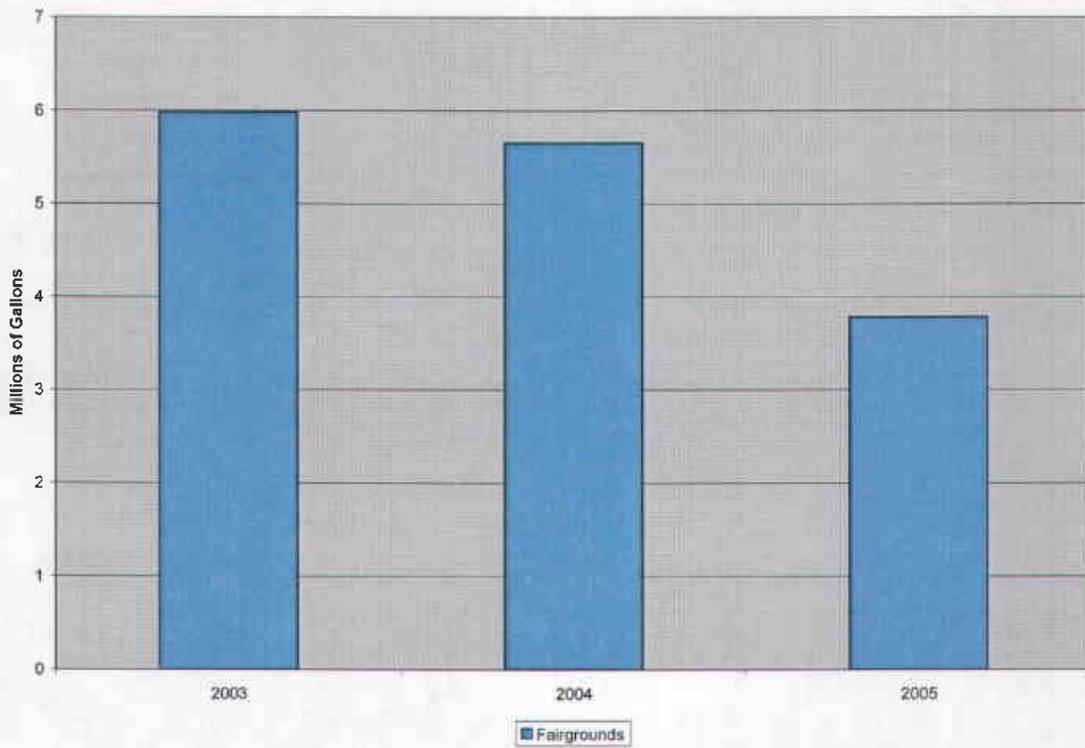
**FIGURE 2.4**

Annual Well Contributions – North County 2003 – 2005



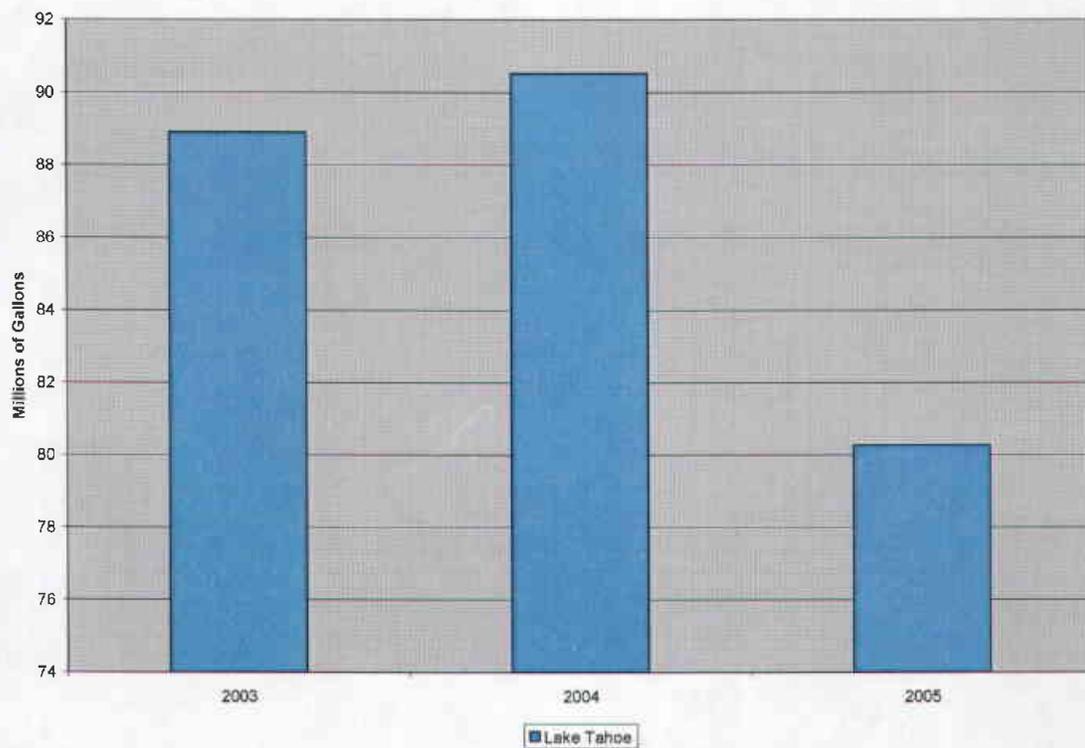
**FIGURE 2.5**

Annual Well Contributions – Fairgrounds 2003 – 2005



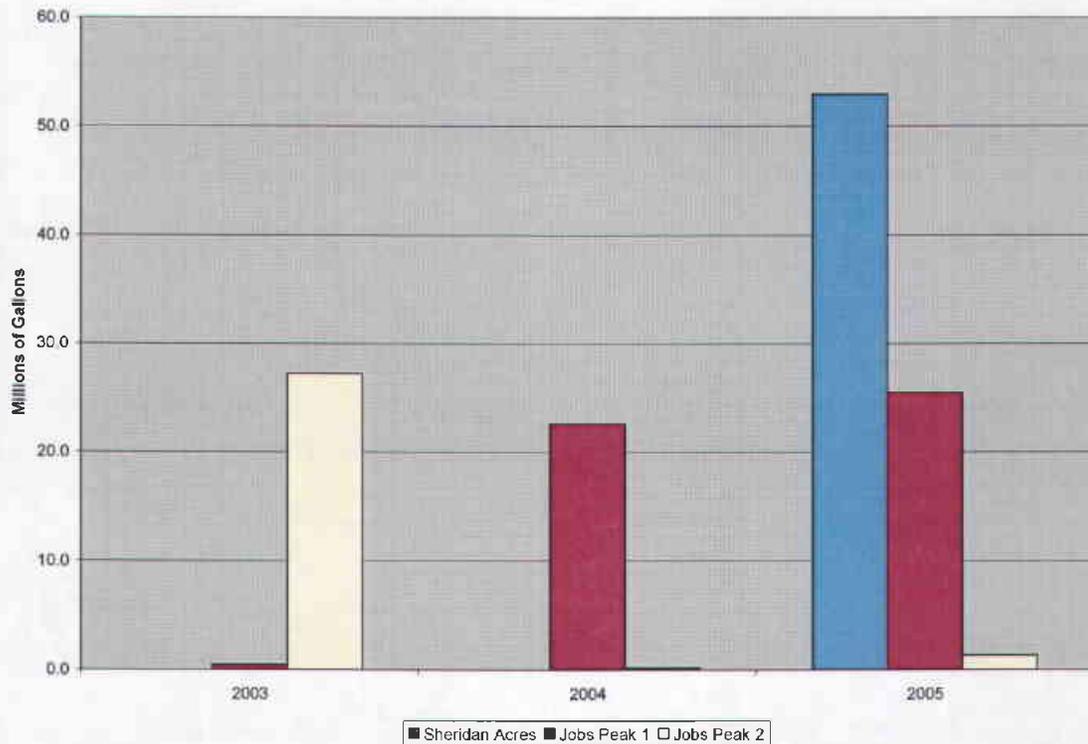
**FIGURE 2.6**

Annual Well Contributions – Lake Tahoe 2003 – 2005



**FIGURE 2.7**

Annual Well Contributions – Foothill 2003 – 2005



The figures show that well demand increased in the West and East Valley, Sunrise Estates, and North County service areas while it decreased at the Fairgrounds and Lake Tahoe.

### Storage

Table 2.3 includes the 21 DCU storage tanks and their capacities. Average daily water use in 2005, including unaccounted-for water, was 1,658,921 per day. The total storage amount shows that in the event a disaster disables portions of the DCU system, there is enough existing storage for approximately seven days of average water use (according to 2005 usage).

**TABLE 2.3**

DCU Storage Tanks and Capacities

NO.	TANK NAME	CAPACITY (gal)
1	China Springs	325,900
2	Fairgrounds	200,000
3	Sierra Shadows	410,000
4	Genoa Lakes	730,000
5	Eagle Ridge	307,800
6	Sheridan Acres	298,000
7	Job's Peak	555,200
8	Jack's Valley/North County	2,000,000
9	Canyon Creek - Upper	1,034,186
10	Canyon Creek - Lower	500,000
11	Airport	300,000
12	Johnson Lane	1,584,320
13	Skyline	507,582
14	Mountain View	600,800
15	ZWUD	626,000
16	Lower Cave Rock	198,000
17	Upper Cave Rock	216,000
18	Lakeridge	300,000
19	Hidden Woods	124,000
20	Skyland	850,000
21	Uppaway	135,000
<b>Total</b>		<b>11,802,788</b>

### 2.3 Water Use Profile

DCU provides water for the following types of water consumers:

- Residential
- Commercial
- Industrial
- Agricultural
- Hydrants, including construction use
- County
- Cemeteries
- Miscellaneous

Metered customers are classified as follows:

- Residential
- Commercial
- Irrigation
- Hauled
- Fill Station

Table 2.4 shows the 2005 total amounts of water consumed by each of these classes.

**TABLE 2.4**

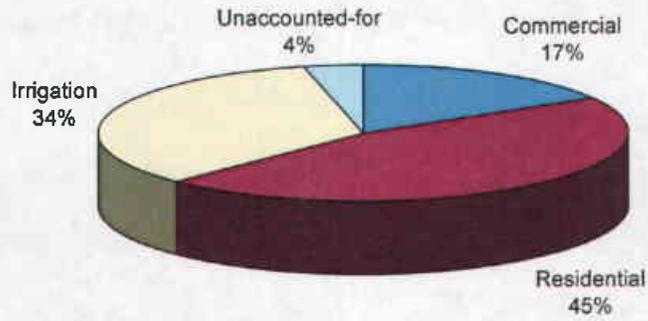
Water Consumed in 2005 (kgal)

Class	West Valley	East Valley	Sunrise Estates	North County	Fair-grounds	Lake Tahoe*	Totals
Residential	51,493	301,745	8,587	-	5	56,192	418,022
Commercial	18,868	26,139	-	15,640	273	16,055	76,975
Irrigation	37,998	32,887	-	5,005	1,978	-	77,868
Hauled	-	-	-	1,691	416	-	416
Fill Station	-	-	-	-	410	-	410
Unaccounted-for	4,007	8,045	2,384	-	701	8,027	31,815
<b>Total</b>	<b>112,366</b>	<b>368,816</b>	<b>10,971</b>	<b>22,336</b>	<b>3,783</b>	<b>80,274</b>	<b>605,506</b>

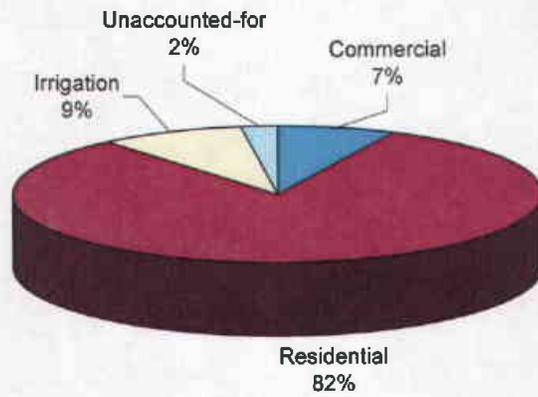
\*Lake Tahoe connections are unmetered therefore the Residential, Commercial and Unaccounted-for numbers were estimated to be 70, 20, and 10% (respectively) of the total amount pumped.

The unaccounted-for water listed in Table 2.4 is the difference between the amount pumped and the amount charged to customers (metered). Each of the sub-systems has a different percentage of unaccounted-for water with some of the systems being below the industry standard of ten percent. This is shown in Figures 2.7 through 2.11. Note that the Foothill system is not included here. It is currently unmetered with customers being charged a flat rate. Meters will soon be installed in this system. The China Springs system is also not shown. This is because a well failure has required that water be hauled to a storage tank supplying the system. Water hauled to China Springs has been supplied by wells in the Fairgrounds and Sunrise Estates systems.

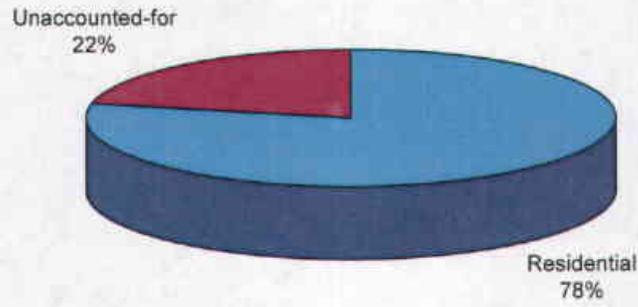
**FIGURE 2.7**  
West Valley Water Use, 2005



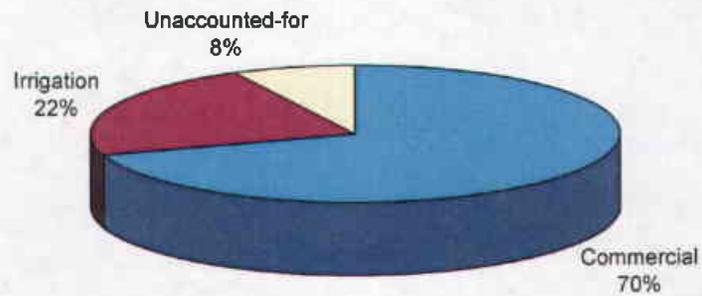
**FIGURE 2.8**  
East Valley Water Use, 2005



**FIGURE 2.8**  
Sunrise Estates Water Use, 2005

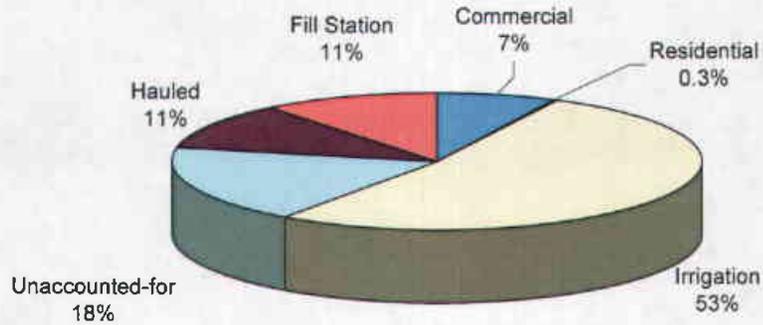


**FIGURE 2.9**  
North County Water Use, 2005



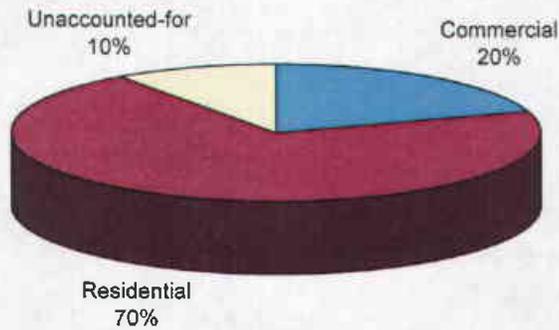
**FIGURE 2.10**

Fairgrounds Water Use, 2005



**FIGURE 2.11**

Lake Tahoe Water Use, 2005



Causes for water being unaccounted for are numerous. Leaking mains, dead meters, under-registering meters, record keeping practices, un-metered uses, and multiple users on meters all contribute to the problem.

Since the West and East Valley systems have the highest concentration of residential customers, those systems are used to determine the average residential per gallon per capita per day usage (gpcd). According to the U.S. Census bureau the average number of persons per household in Douglas County in 2000 was 2.5. This amount is used to estimate the gpcd shown in Table 2.4. Note that the State average is 200 gpcd.

**TABLE 2.5**

Average Residential per capita per day use in 2005

System	Total 2005 Metered Use (kgal)	Number of Connections	gpcd
West Valley	51,493	223	253
East Valley	301,745	1,472	225

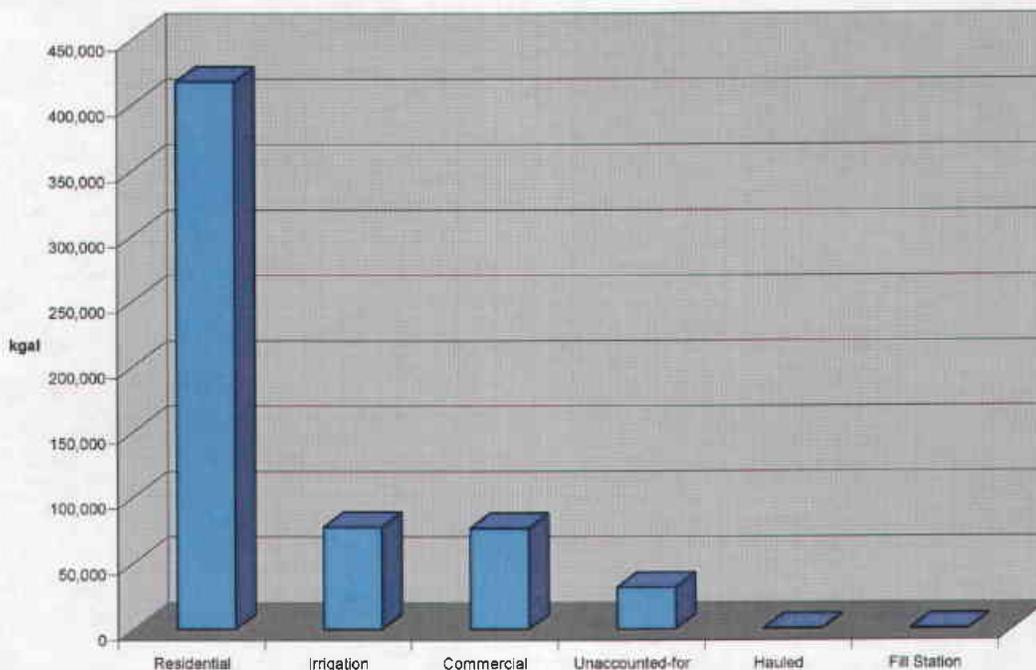
Table 2.3 shows that per capita use is 28 gallons per person per day higher in the West Valley than it is in the East Valley. This may be attributed to the fact that the average West Valley residence, including landscape, is larger than the average East Valley residence. It also may be because West Valley residential water rates are lower than the East Valley rates.

Figure 2.12 shows total water use for DCU in 2005. The chart emphasizes the importance of residential water conservation.

Figure 2.13 shows that the DCU total unaccounted-for water percentage is well below the industry standard of 10%. For this reason each sub-system was considered separately in order to determine the greatest source of unaccounted-for water and thereby establish a plan for its reduction.

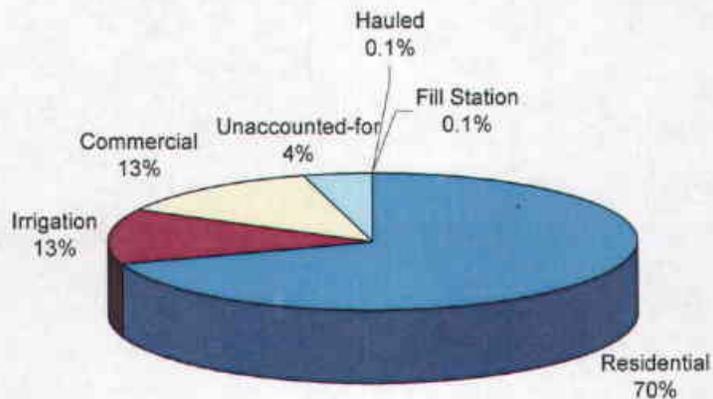
**FIGURE 2.12**

Douglas County Utilities Total Water Use 2005



**FIGURE 2.13**

Douglas County Utilities Total Water Use 2005



## 2.4 Water Demand Forecast

Population estimates by the U.S. Census Bureau indicate that Douglas County grew at an average rate of 2.4% per year between 2000 and 2005. A demand forecast was created by applying this rate to metered amounts for 2005 (the forecast does not account for water losses). Table 2.6 includes 20 years of projected metered totals for all DCU systems.

**TABLE 2.6**

Production Forecast 2005 – 2025 (kgal)

Year	Demand
2005	605,506
2006	618,112
2007	631,020
2008	644,238
2009	657,773
2010	671,633
2011	685,825
2012	700,359
2013	715,241
2014	730,480
2015	746,085
2016	762,064
2017	778,427
2018	795,183
2019	812,341
2020	829,910
2021	847,901
2022	866,325
2023	885,190
2024	904,508
2025	924,289

The forecast assumes that each customer class consumes the same percentage of the total amount each year. It also assumes that the Lake Tahoe system experiences no growth. It should also be noted that a 2.5% growth cap has been instituted in Douglas County.

## 2.5 Estimated Amount of Water Conserved Due to Measures and Incentives

Table 2.7 (See Appendix H) shows the range of residential use per person per day using the U.S. Census 2006 average persons per household estimate (2.5) for Douglas County.

**TABLE 2.7**

Range of Residential Water Use in Gallons per Day (EPA Estimates)

Use	Per Person (Low)	Per Person (High)
Toilets	6.4	48.00
Showers	7.50	75.00
Baths	6.00	10.00
Washing Machine	9.00	25.00
Dish Washer	1.00	4.50
Kitchen Faucet	1.00	15.00
Bathroom Faucet	1.00	9.00
Landscape	12.2	162.6
<b>Total</b>	<b>44.1</b>	<b>349.1</b>

Currently the average per person per day use in the DCU service area is approximately 230 gallons which is higher than the State average (200 gpcd). The application of residential conservation measures and incentives encouraged through education (see Section 5.5) could reduce this average. The per person usage range shown in Table 2.7 provides conservation benchmarks for residential water use and DCU is approximately at mid-range. An estimated conservation-initiated reduction of 50 gpcd (down to 180 gpcd) would place DCU residential water use at or below the State average. Table 2.8 shows a range of potential averages based on different customer participation levels.

**TABLE 2.8**

Residential Conservation Resulting from Education (East and West Valley Systems)

% of Users Consuming 190 gallons/day	New gpcd Average (gal)	Amount Conserved Annually (MG)
25	217.5	16.8
50	205.0	36.2
75	192.5	55.5

\*Table assumes level population

Table 2.8 assumes a population of 4,238 within the East and West Valley systems. This figure is developed by multiplying the total number of connections in those systems (1,695) by 2.5 (number of persons per household in Douglas County according to the U.S. Census). The East and West Valley systems were used because they have the greatest number of residential users and are representative of the entire DCU service area.

The amounts in Table 2.8 are what will be expected as a result of conservation education. A range is provided because it is difficult to determine the level of individual participation that will result from educational efforts.

It should also be noted that additional water will be conserved through effluent use. However the effluent (approximately 280,000 gpd) will be used for agricultural purposes and will not have any effect on residential, commercial, or industrial use.

**END OF SECTION**

## SECTION 3 – CONSERVATION INCENTIVES

Conservation incentives by definition are those things that increase awareness and encourage conservation. There are three general categories of conservation incentives; Educational, Financial, and Regulatory. The following sections include examples of the three types of incentives.

### 3.1 Educational Conservation Incentives

3.1.1 Literature. Douglas County in conjunction with the University of Nevada Cooperative Extension has created conservation literature designed to address the specific needs of the Carson Valley. The literature is distributed twice per year, once around May 1 and again around August 1. An example of the pamphlets is included in Appendix A.

Water conservation related literature is available from many sources. One of the best may be the American Water Works Association (AWWA). The AWWA publishes a number of water conservation pamphlets that cover topics ranging from home fixture repair to water conserving landscapes. The University of Nevada Cooperative Extension also publishes conservation related literature containing landscaping information. Examples of AWWA and Extension pamphlets are in Appendix A.

There are several ways that DCU can distribute conservation literature. Many of the AWWA pamphlets are sized to fit in a number 10 envelop. These pamphlets can be mailed with customer billings or separately. Literature can also be distributed at public gatherings including include fairs, Boy Scout and Girl Scout activities and school events.

3.1.2 Internet. Websites can be used to provide conservation information. Some of the most informative conservation related websites were created by water purveyors in Nevada. These organizations include the Las Vegas Valley Water District, Southern Nevada Water Authority, and the Truckee Meadows Water Authority. These websites include information covering the following topics:

- Drought
- Watering schedules
- Landscaping
- Water saving appliances and fixtures

A list of these websites can be found in Appendix C.

3.1.3 School Visits. DCU can visit local schools and teach children about conservation. There are a number of water models available that can be used to do this. An example of one of these models is shown in figure 3.1. This water model was created by professors at the University of Nebraska but there are other sources through which such model may be obtained.

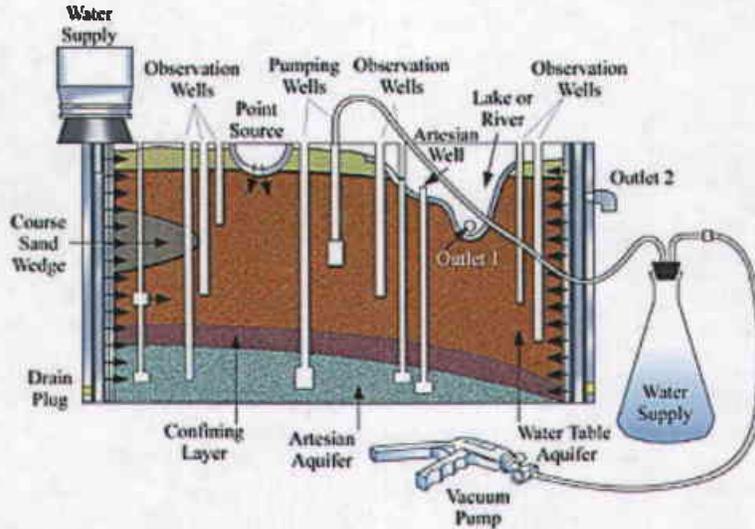
Additionally, the Douglas County school system has used a conservation program sponsored by the U.S. Department of Agriculture to teach children in grades first through fifth.

3.1.4 Education for Large Water Consumers. Some DCU customers consume large amounts of water as a matter of necessity. Examples of these customers include hotels, golf courses, manufacturing companies and even large homes. Schools and parks may also use large

amounts of water. DCU can encourage these entities to use water more efficiently by offering conservation training or performing audits that help pinpoint sources of potential waste. DCU can also sponsor courses offered by the Irrigation Association. These courses provide information on irrigation techniques including audits, design, installation and maintenance. Information for the Irrigation Association may be found at [www.irrigation.org](http://www.irrigation.org).

**FIGURE 3.1**

University of Nebraska Standard Ground Water Model



### 3.2 Financial Conservation Incentives

3.2.1 Rates. DCU uses an inclining block rate structure for most of its sub-systems. Inclining block rates increase with consumption which effectively encourages conservation. Generally speaking, DCU rates are divided into three classes; residential, commercial/industrial, and irrigation. Note that all of DCU's sub-systems have different rates. This is because each system has its own specific cost basis and the rates have been customized to reflect those costs. DCU's inclining block rates start with a fixed rate and then a triple-tiered structure; Tier 1 = 0 to 8,000 gallons, Tier 2 = 8001 to 24,000 gallons, Tier 3 = 24,001+. Although some of DCU's systems have flat rates those rates are high enough to encourage conservation. Appendix D contains rate schedules for each of the DCU sub-systems.

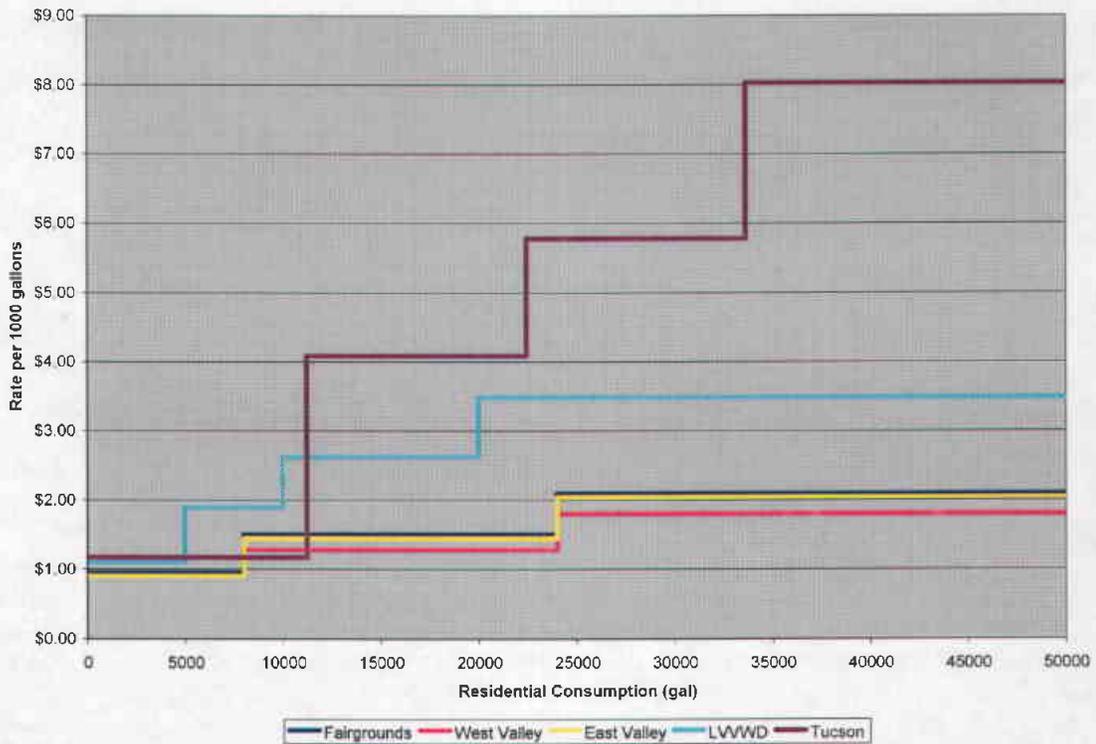
*Will these system be restored in future?*

*Save for well conserving in water...*

Figure 3.2 shows the marginal price curves for three DCU sub-systems. They are compared with curves from Las Vegas Valley Water District (LVVWD) and the Tucson, Arizona water system. The curves are shown together to illustrate the different approaches to rate-related conservation. Note that the Tucson curve starts at approximately the same level as the others but then increases in the second tier and remains higher than the others from that point forward.

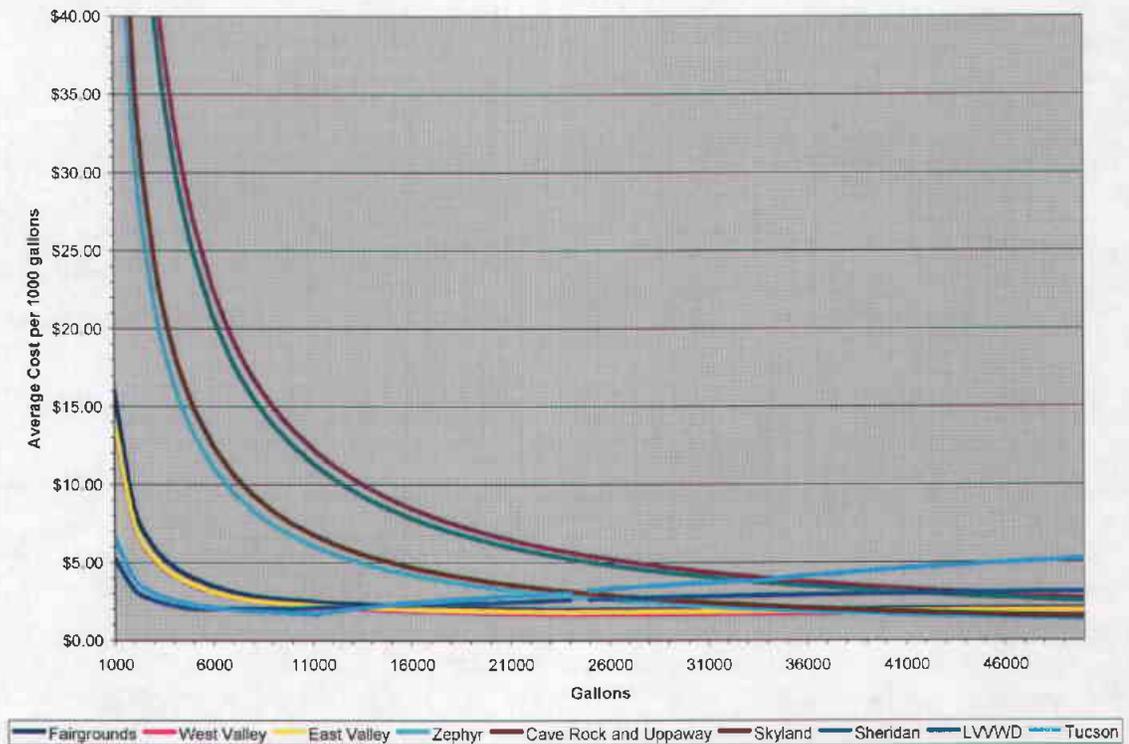
**FIGURE 3.2**

Marginal Price Curves for Douglas County Utility Systems, LVVWD and Tucson



**FIGURE 3.3**

Average Price per 1,000 gallons for Douglas County Utility Systems, LVVWD and Tucson



Although the marginal rates in Figure 3.1 show the price of water increasing with use, it is actually the average price per unit that has the greatest impact on conservation. Figure 3.3 shows the average price per thousand gallons for each system. Tucson's average price per thousand gallons increases at high consumption levels. DCU has three systems with tiered rates and five systems with fixed rates. It is interesting to note that both types of rates end up with the same average cost per thousand gallons at higher consumption levels. The fact that the fixed rate systems have a higher average cost at lower consumption levels probably neither encourages nor discourages conservation since the cost of the water is the same no matter how much is used.

*is it anticipated that all systems will be metered*

Table 2.5 shows the different per capita per day amounts consumed by East Valley (225 gpcd) and West Valley (253 gpcd) customers. To a degree this may be a function of rates since West Valley water rates are lower than East Valley rates. Rates can be a great incentive to conserve water. However, high rates don't always motivate customers to conserve. Many water utilities have discovered that customers with above average incomes would not be motivated to conserve no matter how high water rates were. In those cases, educational and/or regulatory incentives may be more effective.

*Let eyes hand-scraping*

DCU is in the process of performing rate analysis for each of its systems. This is because current rates are not a reflection of costs or revenue needs. The new rates will reflect the costs of each individual system and are more likely to encourage conservation. Costs include operation, reserve account funding, and payment requirements for the system's past debts. Consideration will also be given to the industry standard that reasonable rates are  $\leq 1.5\%$  of the median household income.

3.2.2 Savings from Efficient Plumbing Fixtures. Even though the Federal Energy Policy Act (FEPA) has mandated the manufacture and installation of efficient plumbing fixtures since 1994, there are still inefficient fixtures and appliances in use. Table 3.3 shows the potential savings from efficient fixtures.

**TABLE 3.3**

Potential Water Savings

Fixture*	Fixture Capacity	WATER USE (gpd)		WATER SAVINGS (gpd)	
		Per Capita	Per Household**	Per Capita	Per Household**
<b>Toilets***</b>					
Efficient	1.5 gal/flush	6.0	16.2	N/A	N/A
Low-Flow	3.5 gal/flush	14.0	37.8	8.0	21.6
Conventional	5.5 gal/flush	22.0	59.4	16.0	43.2
Conventional	7.0 gal/flush	28.0	75.6	22.0	59.4
<b>Showerheads†§</b>					
Efficient	2.5 [1.7] gal/min	8.2	22.1	N/A	N/A
Low-Flow	3.0 to 5.0 [2.6] gal/min	12.5	33.8	4.3	11.7
Conventional	5.0 to 8.0 gal/min	16.3	44.0	8.1	22.0
<b>Faucets†§</b>					
Efficient	2.5 [1.7] gal/min	6.8	18.4	N/A	N/A
Low-Flow	3.0 [2.0] gal/min	8.0	21.6	1.2	3.2
Conventional	3.0 to 7.0 gal/min	13.2	36.6	6.4	17.2
<b>Fixtures Combined</b>					
Efficient	N/A	21.0	56.7	N/A	N/A
Low-Flow	N/A	34.5	93.2	13.4	36.4
Conventional	N/A	54.5	147.2	33.5	90.4

Source: Amy Vickers, "Water Use Efficiency Standards for Plumbing Fixtures: Benefits of National Legislation", *American Water Works Association Journal*, Vol 82 (May 1990): 53

\*Efficient = post-1994, Low-Flow = post-1980, Conventional = pre-1980; \*\*Assumes 2.7 persons per household.

\*\*\*Assumes four flushes per person per day. Does not include losses through leakage.

†For showerheads and faucets: maximum rated fixture capacity [measured fixture capacity]. Measured capacity equals about 2/3 the maximum.

§Assumes 4.8 shower-use-minutes per person per day and 4.0 faucet-use-minutes per person per day.

The potential savings shown in table 3.3 could make a plumbing retrofit program feasible.

**3.3 Regulatory Conservation Incentives**

3.3.1 Codes and Ordinances. The Douglas County Consolidated Development Code includes both a landscape code and a water ordinance. The landscape code can be found in Chapter 20.694 and the water ordinance in Title 20, Appendix F (see Appendix I).

The water ordinance includes conditions under which service may be terminated for reasons of waste. It also establishes the County’s right to restrict and apportion water during times of drought or any other emergency that threatens the water supply.

These documents are valuable resources for the prevention of waste. However as the County continues to grow, it will become necessary to establish an enforcement element in order to insure code compliance.

3.3.2 Potential Savings from Conservation Measures and Incentives. Potential conservation related consumer savings is shown in Table 3.4. The table shows estimated water savings resulting from the application of mandatory conservation measures shown in Table 4.3.

**TABLE 3.4**

Estimated Water Savings from Mandatory Measures (assumes 100% participation)

<b>Mandatory Measure</b>	<b>Savings (gpcd)</b>	<b>*Total Annual Savings Range (\$)</b>
Low flow faucets (#1)	12.48	6,969 – 16,185
Ultra Low Flow Toilets (#2)	7.07	3,948 – 9,169
Landscape/Outdoor (#3 - #8)	18.56	10,365 – 24,069
<b>Totals</b>	<b>38.11</b>	<b>21,282 – 49,423</b>

\*Assumes 100% participation by 1,700 customers. Savings amounts are calculated using current tiered rates. Ranges are calculated using the lowest tier from the system with the lowest rates and the highest tier from the system with the highest rates.

Currently three systems in the DCU service area have tiered rates for residential customers. Most of DCU’s residential customers are in these systems. It should be noted that DCU is in the process of creating new rates to reflect current costs.

**END OF SECTION**

## SECTION 4 – CONSERVATION MEASURES

A conservation measure is a device or practice that reduces water consumption. Conservation measures are divided into two fundamental categories; 1, Hardware or equipment and 2, Behavior or management practices. Examples of hardware measures include low-volume toilets and irrigation rain sensors. Examples of behavioral measures include not using the toilet as a trash can and watering lawn less frequently.

Some conservation measures are mandated by state and/or federal laws and others are voluntarily implemented by local water purveyors and/or customers. This section discusses both.

### 4.1 Plumbing Standards

The most recent federal plumbing standards (table 4.1) are included here since these standards are applicable to the DCU service area. It is valuable to include California's standards for reference since in most cases California's requirements are more stringent. The comparison infers that there are plumbing fixtures available that exceed federal efficiency requirements and offer consumers alternatives that further improve conservation efforts.

**TABLE 4.1**

Federal and California Plumbing Standards

Device	FEDERAL ENERGY POLICY ACT (FEPA)		CALIFORNIA	
	Manufacture	Effective Date	Sale and Installation	Effective Date
Shower Heads	2.5 gpm*	1/1/94	2.5 gpm	3/20/92
Lavatory Faucets	2.5 gpm	1/1/94	2.2 gpm	3/20/92
Sink Faucets	2.5 gpm	1/1/94	2.2 gpm	3/20/92
Metering Faucets	*	1/1/94	†	7/1/92
Tub Spout Diverters	Not included in FEPA		0.1 to 0.3‡	3/20/92
Residential Toilets	1.6 gpf	1/1/94	1.6gpf	3/20/92
Flushometer Valves	1.6 gpf§	1/1/97	1.6 gpf	1/1/92
Commercial Toilets	1.6 gpf	1/1/97	1.6 gpf	1/1/94
Urinals	1.0 gpf	1/1/94	1.0 gpf	1/1/92

\* Gallons per minute.

\*\* 0.25 gal/cycle (pertains to maximum water delivery per cycle).

† Hot water maximum flow rate range from 0.25 to 0.75 gal/cycle and/or from 0.5 gpm to 2.5 gpm, depending on controls and hot water system.

‡ 0.1 (new), to 0.3 gpm (after 15,000 cycles of diverting).

§ Gallons per flush.

### 4.2 DCU Conservation Measures

**4.2.1 Reduction in Un-accounted-for Water.** Reducing unaccounted-for water can save millions of gallons a year as well as benefit DCU by reducing lost revenue.

Table 4.2 shows the unaccounted-for amounts for each system in 2005. In general DCU has done well in keeping unaccounted-for water percentages relatively low. However this is an aspect of conservation that can always improve. In this system there are two approaches that can be taken to reduce losses. One is to concentrate on the sub-system that has a higher percentage of unaccounted-for water than any of the other sub-systems. The other is to focus on the sub-system with the highest amount of unaccounted-for water.

The second approach is more difficult because it may involve the largest of the sub-systems. Whatever the approach, the effort should be proactive. Repairing obvious leaks doesn't always reduce the amount of unaccounted-for water since leaks aren't the only source of losses.

**TABLE 4.2**

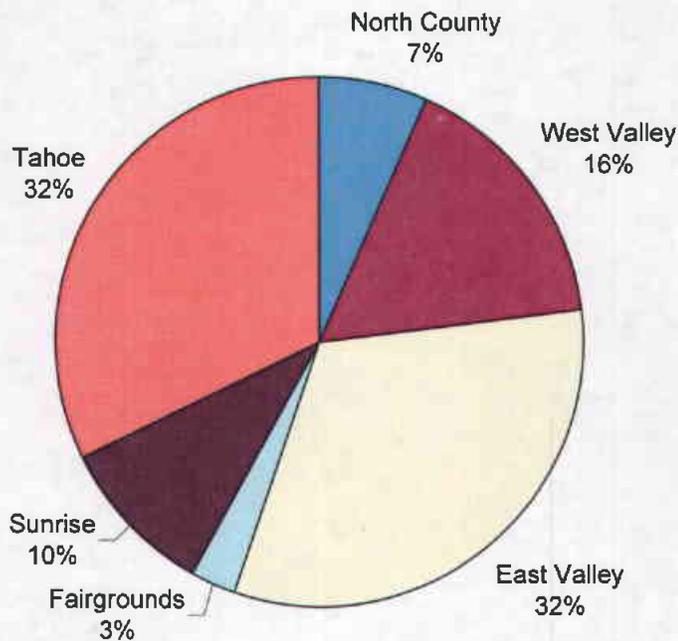
DCU Unaccounted-for Water

Sub-System	Amount (kgal)	% of Sub-system Total	% of DCU Total
North County	1,691	8	5
West Valley	4,007	4	13
East Valley	8,045	2	25
Fairgrounds	701	18	2
Sunrise Estates	2,384	22	30
Tahoe*	8,027	10	25
<b>Total</b>	<b>24,855</b>		

\*Estimated (no meters)

**FIGURE 4.1**

DCU Unaccounted-for Water Percentage Contributions of Each System (2005)



According to Table 4.2 and Figure 4.1, reducing unaccounted-for water in the Sunrise and Tahoe sub-systems could substantially reduce the percentage of unaccounted-for water for the entire DCU system.

4.2.2 Leak Reduction. Leak reduction is an integrated part of the DCU 5 year Capital Improvement Plan (CIP). The utility has identified 44+ leaks and has secured funding for the replacement of the distribution system piping where the leaks are located. Leak reduction will continue to play an important role in the DCU CIP.

4.2.3 Use of Treated Effluent. Goal 5.15, Policy 5.15.02 of the Douglas County Master Plan, 2006 Update states the following:

*“Treated effluent will be used to replace supplemental and non-supplemental groundwater pumped for irrigation purposes where feasible.”*

Currently treated effluent is imported to the Carson Valley by Incline Village General Improvement District (IVGID) and Douglas County Sewer Improvement District No. 1. (DCSID No. 1). The effluent is stored in the Valley and used for agricultural irrigation.

Both the Minden-Gardnerville Sanitation District (MGSD) and the Indian Hills General Improvement District (IHGID) store treated effluent which is subsequently used for summertime irrigation purposes.

The County's North Valley Wastewater Treatment Facility is in the process of constructing a phase 2 storage facility for effluent to be used for irrigation. Once the storage facility is completed the treated effluent will supply irrigation water to Bently Agrowdynamics. Currently the plant is discharging 278,000 to 300,000 gpd into the IVGID wetlands.

Two alternative uses for treated effluent mentioned in the Master Plan include:

1. *“...to supplement existing surface water rights rather than supplemental wells, thereby reducing the pumpage of the groundwater resource.”*
2. *“...to replace the use of existing surface water rights for irrigation and use the surface water rights to recharge the Groundwater Basin.”*

Uses for treated effluent include agricultural irrigation, commercial/industrial landscape irrigation and institutional landscape irrigation including parks and cemeteries.

4.2.4 Drought Measures. These measures are designed to insure a continued water supply in times of drought. Drought measures are more restrictive than those implemented during normal water years. The DCU Drought Plan is found in Section 5.

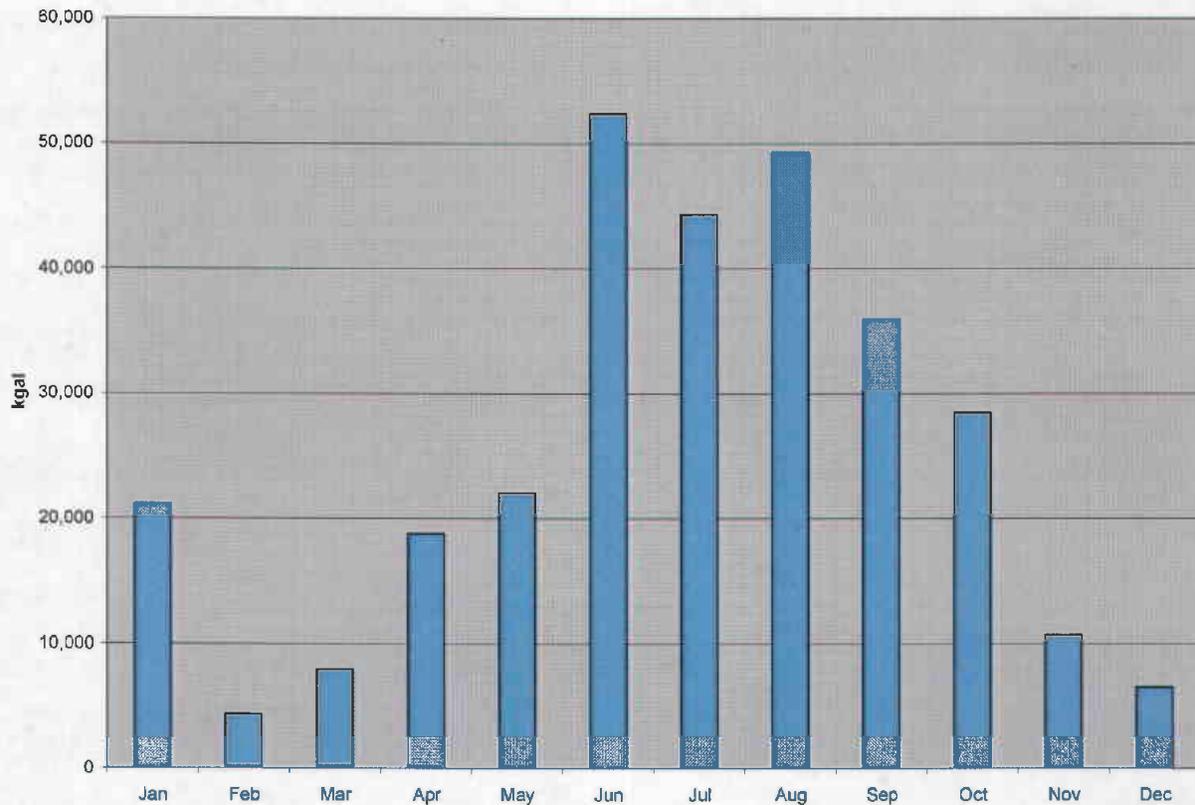
### 4.3 Consumer Conservation Measures

Residential use in the DCU service area accounts for approximately 70% of all water used. For this reason, the success of conservation planning will be dependant upon the effectiveness of residential conservation measures.

Of all residential water uses, landscaping consumes the greatest amount of water (65% to 75% of summer use) and can be the greatest source of waste. Education programs targeting residential landscapes may be the most efficient way to reduce residential usage. Figure 4.2 shows residential use in the East Valley system in 2005. Note the spike in use during the summer months.

**FIGURE 4.2**

East Valley Residential Use, 2005



**4.3.1 Submetering.** Submeters are meters installed in the main water lines that enter the individual units of multi-family properties (apartments, condominiums, duplexes, etc...) and/or subdivided areas of commercial, industrial, or institutional (ICI) facilities. Traditionally such properties and facilities were built with one master meter that served the entire complex or facility. Submeters can be used as a measure that property or company owners can use to conserve water and cut costs. Submetering has the following basic advantages:

- Decrease in overall water consumption of 18% to 39%<sup>1</sup>
- Fair allocation of water costs to residents.
- Potential increase in property owners net operating income.
- Increase in water use efficiency
- Proper allocation of water costs within ICI operations

<sup>1</sup> *Submetering, RUBS, and Water Conservation*, prepared for the National Apartment Association and the National Multi Housing Council by Industrial Economics Incorporated, June 1999.

In residential applications, submeters can reduce consumption by making the individual users responsible for their own water bill. When water use by multi-family units are measured by a single meter, leaks in individual units often go undetected. Measuring the consumption of each unit may also discourage waste.

In ICI applications separate meters can be used for individual processes thereby encouraging use efficiency. Landscape irrigation can be monitored separately from facility use. In institutions such as universities, water costs can be directed to the departments that use the water. Manufacturers can cut costs and determine which processes or equipment needs to be improved or replaced.

There are some disadvantages to submetering. Retrofits may be expensive and may prove to be economically unfeasible. Also some of the financial incentive for landlords to install conservation devices (low-volume toilets and low-flow fixtures) is removed. These shortcomings however are not present in new construction. Whether new construction or retrofit, consideration should be given to both conservation and cost.

4.3.2 General Consumer Conservation Measures. Currently there are eight mandatory conservation measures that DCU customers are expected to comply with. They are the following:

1. Install and maintain low flow devices on showers and aerators on faucets.
2. Install ultra low flow toilets when replacing existing ones.
3. Use a nozzle that automatically shuts off when washing cars.
4. Plan, plant and manage landscaping to maximize water efficiency.
5. Do not water lawns, landscaping, and gardens between 1:00 p.m. and 5:00 p.m.
6. Do not allow water to pool, pond, or runoff from applied areas.
7. Do not allow water to run down streets due to excessive watering or poorly maintained sprinklers.
8. Equip all fountains, ponds, or pools for recycling water.

Table 4.3 shows the estimated amount of water saved through compliance with each mandatory conservation measure. The table was created by applying the corresponding average percentage of total use for each category in Table 2.7 (page 18) to the target reduction goal of 50 gpcd. Measures 3 through 8 are all landscape/outdoor related activities. The table assumes 1,800 residential connections.

**TABLE 4.3**

Estimated Water Savings for Mandatory Measures (assumes 100% participation)

Mandatory Measure	Savings (gpcd)	Total Annual Savings (MG)
Low flow faucets (#1)	12.48	8.2
Ultra Low Flow Toilets (#2)	7.07	4.6
Landscape/Outdoor (#3 - #8)	18.56	12.2
<b>Totals</b>	<b>38.11</b>	<b>25</b>

Because landscaping makes up 60% to 75% of summer water use, a primary goal of this plan is to encourage smaller turf areas and xeriscapes. Improved landscape practices have the potential to conserve a large amount of water.

Additional consumer residential, landscape, industrial, commercial and institutional measures are included in Appendix B. There are also two plant guides available to consumers, one created especially for Lake Tahoe by the University of Nevada Cooperative Extension Service and the other created by the Truckee Meadow Water Authority (TMWA).

END OF SECTION

Trigger points and the associated measures have been identified for each stage of drought. When water system operators and managers determine that a trigger point has been reached, they will bring the appropriate information and data to the County Board of Commissioners (Board) for action. The Board will weigh the information and decide what stage of drought should be declared. Once a drought stage has been declared, all measures pertaining to that stage will be implemented and enforced.

Each water system will be monitored autonomously from other systems. When conditions within any system warrant action to anticipate a drought or to endure a drought, the operators and management will inform the Board. The Board shall decide if a drought condition exists in just the service area of the individual water system or will include other systems in the drought finding, as the Board deems appropriate.

In the event of a drought declaration, the following restrictions will be imposed upon all water users of systems owned or operated by Douglas County within the Carson Valley and Topaz Lake area.

### **Stage 1: Drought Warning Stage**

#### Trigger

The Drought Warning Stage is declared when precipitation is below normal. Precipitation is monitored by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service Station at Glenbrook, Nevada. During the period between the months of October and March, inclusive, when total precipitation for two consecutive months within the period is less than three inches or when total rainfall for the entire period is less than fourteen inches, the water system operators and manager will inform the Board of the condition. The Board will then decide if Drought Warning Stage conditions exist and if so, will make an official declaration. All water customers of systems operated by Douglas County

#### Measures

1. Media announcements will be made informing water users of the drought conditions. Announcements should include the restrictions associated with this stage of drought.
2. All water conservation measures practiced during normal water years (see Appendices B, C, and D).
3. Water service to customers who allow broken sprinklers to operate for two hours will be shut off until the sprinkler is repaired.
4. The County may limit service by use of a flow restriction device, or may shut off service to users that allow leaks on the service side of the water meter to go without repair for a period of longer than five days after receiving written notice of the leak, or after having received three notices for similar violations.

### **Stage 2: Severe Drought Stage**

#### Trigger

The Severe Drought Stage is declared when groundwater levels are below normal, usually, but not necessarily, following a Drought Warning Stage. Well levels of water systems operated by Douglas County within the Carson Valley and Topaz Lake area shall be monitored. When well depths drop below the levels indicated in Table 1, the water system operators and manager will inform the Board of the condition with an opinion as to what drought condition exists or is

anticipated. The Board will then make a determination as to what drought stage (if any) should be declared.

Measures

These measures shall be in addition to or supersede those included in the Drought Warning Stage.

1. Residents with even numbered addresses shall water only on Monday, Wednesday, and Saturday.
2. Residents with odd numbered addresses shall water only on Tuesday, Thursday, and Sunday.
3. Commercial and industrial customers shall water only on Tuesday and Friday.
4. Use of water for construction or maintenance activities including dust control, soil compaction and/or concrete curing is prohibited.
5. Use of fire hydrants other than for fire protection is prohibited.
6. Serving of water in restaurants is prohibited except upon request.

**Stage 3: Emergency Drought Stage**

Trigger

The Emergency Drought Stage is declared when groundwater levels are significantly below normal and there are substantial water needs that are not being met. The Emergency Drought Stage usually, but not necessarily, follows a Severe Drought Stage. Well levels of water systems operated by Douglas County within the Carson Valley and Topaz Lake area shall be monitored. When well depths drop below the levels indicated in Table 1, the water system operators and manager will inform the Board of the condition with an opinion as to what drought condition exists or is anticipated. The Board will then make a determination as to what drought stage (if any) should be declared.

There are other situations that make an Emergency Drought Stage declaration necessary. These include emergency repairs or major reconstruction on one of the County maintained systems. If a system requires such a repair and there is no system redundancy to bypass the affected area, the county will ask that an Emergency Drought Stage be declared. Notification of this condition will be made in the media and through door to door notices. All of the mandatory requirements associated with an Emergency Drought Stage will then be enforced for the duration of the repair or reconstruction.

Measures

These measures shall be in addition to or supersede those included in the Drought Warning and Severe Drought Stages.

1. During the months of December, January, and February:
  - All watering of vegetation, including lawns, landscaping, and gardens, shall be prohibited.
2. From March 1 through May 31 and from September 1 through November 30:
  - All watering of vegetation, including lawns, landscaping, and gardens, shall be allowed only one day per week.
  - Customers with even numbered addresses shall water only on Wednesday or Saturday.

- Customers with odd numbered addresses shall water only on Thursday or Sunday.
3. Between June 1 and August 31:
- All watering of vegetation, including lawns, landscaping, and gardens, shall be allowed only two days per week.
  - Commercial and industrial customers shall water only on Tuesday and Friday.
  - Residents with even numbered addresses shall water only on Wednesday and Saturday.
  - Residents with odd numbered addresses shall water only on Thursday and Sunday.
4. Water shall not be used for decorative purposes.

**TABLE 1**

Well Levels and Drought Stages

		DEPTH BELOW NORMAL SEASONAL WATER SURFACE (ft)	
		Severe Drought	Emergency Drought
<b>Airport-Mountain View</b>			
	North Clapham	-2	-3
	South Clapham	-2	-3
	Airport 1	-4	-7
<b>Sierra Shadows-Genoa Lakes</b>			
	Sierra Shadows 1	-18	-27
	Genoa Lakes 1	-18	-27
	Genoa Lakes 2	-18	-27
<b>Ridgeview</b>			
	Ridgeview 1	-7	-10

END OF SECTION

## SECTION 6 – CONSERVATION RECOMMENDATIONS

### 6.1 Effluent

Presently DCU is pumping treated effluent into wetlands in the Carson Valley. Soon it will have the capability to supply local ranches with effluent to be used for irrigation purposes. To encourage conservation of treated effluent, rates should be established prior to supplying it to consumers. Establishing rates now could also help to offset the cost of new treatment and delivery systems.

Initially rates for treated effluent can be based on the anticipated cost of supplying it to users. However, in many areas the demand for effluent is increasing. Because of this the development of new markets for this commodity would justify potential rate increases that would encourage the conservation of this resource. Potential treated effluent users include:

- Parks and Cemeteries
- Golf Courses
- Landscaping of commercial properties
- Agricultural
- Construction

Rates would obviously be less than those for potable water but would encourage conservation nevertheless. Also current trends indicate that the demand for treated effluent is increasing, making effluent an additional source of revenue. Therefore it is recommended that DCU establish rates for the supply of treated effluent and also work toward creating additional markets for its use.

### 6.2 Water Conservation Budget

A water conservation budget should be created to allow for the implementation of conservation measures and incentives. The conservation specialist described in Section 5.4 would be responsible for the use of funds allocated for conservation programs and/or personnel. This budget could be used to purchase educational materials, pay for water audits, and increase conservation staff if necessary.

### 6.3 Conservation Specialist/Supervisor

A member of the DCU staff should be selected to implement and oversee conservation incentives and measures. This person will be responsible for managing a conservation budget, organizing educational programs, overseeing utility conservation efforts (leak detection, public awareness, water loss accountability, etc.), and supervision of any additional conservation personnel. This conservation specialist will review and update the conservation plan at least every five years and will evaluate the effectiveness of existing conservation measures and incentives. This person will also be the head of a conservation committee and will be a source of conservation information and expertise for committee members.

### 6.4 Conservation Committee

A conservation committee should be created from members of the various departments in DCU. A member of the county commission could also be appointed to the committee. This committee is important because some conservation measures can have a broad affect on the utility as well

as the community. For this reason new measures or incentives should be discussed in a forum of department representatives prior to implementation to be certain all contingencies have been considered. For example rate increases could affect revenues and the conservation specialist could benefit from additional insight provided by the accounting and financial experts within DCU.

### **6.5 Education**

Residential customers use more water than any other customer class. Most of the water used by this class is for landscaping. For this reason water efficient landscaping should be the focus of conservation education efforts. These efforts should include a program for school children to include at least annual visits from DCU personnel. The visits should include presentations on water related issues including landscape conservation. Additionally, workshops with a conservation focus could be held for landscapers and nursery personnel.

### **6.6 Regulatory**

The water ordinance should be modified to include more conservation related provisions. This might include regulations relating to the various stages of drought declaration, landscaping and other mandatory conservation measures. It might also be valuable to include submetering provisions in both the water and landscape ordinance.

### **6.7 Monitoring**

The meter records of the customers that consume the greatest amount of water should be monitored. In many systems approximately 10% of the customers consume 25% of the water. By pinpointing the sources of greatest usage, it may be possible to help customers reduce or eliminate unnecessary consumption. It would be difficult to audit all customers but inspections of the landscape irrigation systems of customers that consume the most might be practical. Also commercial and industrial connections could be audited/inspected to determine if their consumption could be reduced. For all water customers there is financial incentive to cut waste. The meter reading instruction in Appendix F could be helpful in this effort.

### **6.8 Unaccounted-for Water**

For the most part DCU has done a good job of keeping unaccounted-for water to a minimum. DCU currently has a plan to reduce unaccounted-for water in those sub-systems with the greatest amount of losses. A data base of leaks has been kept and areas with the greatest amount of leaks have been targeted for priority replacement.

**END OF SECTION**

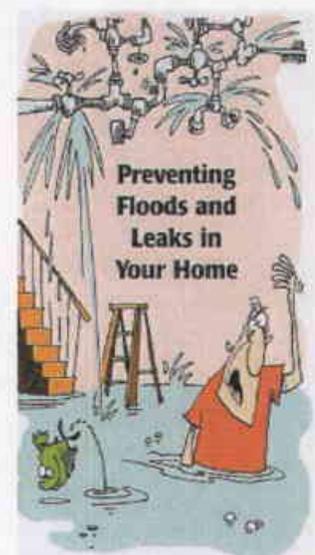
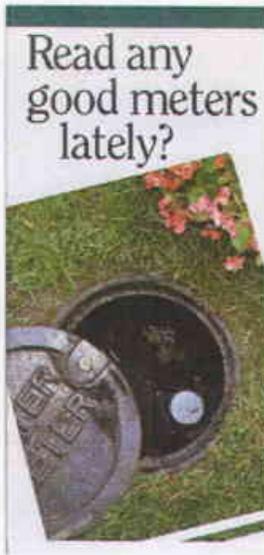
## APPENDIX A – EDUCATIONAL MATERIALS

**Read any good meters lately?** Guide provides instruction for reading and interpreting meter information. It also teaches water customers how to measure the amount of water they use in different applications (see figure 3.1).

**Yes, you can...fix a leaky faucet by yourself** pamphlet gives step-by-step instructions on how to fix a leaking faucet. It includes a list of tools necessary to perform the repairs (see figure 3.2).

### FIGURES 3.1, 3.2, and 3.3

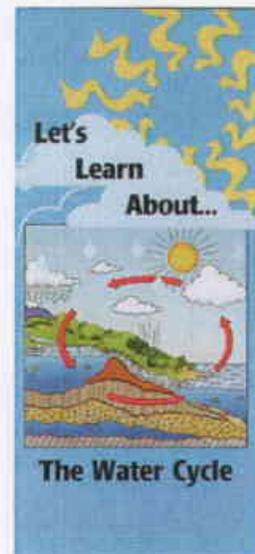
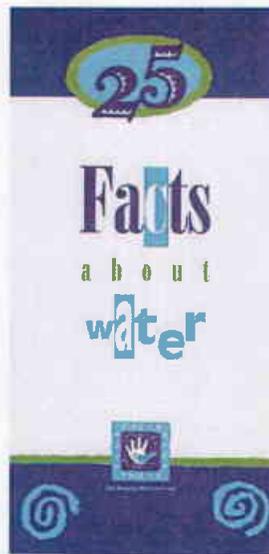
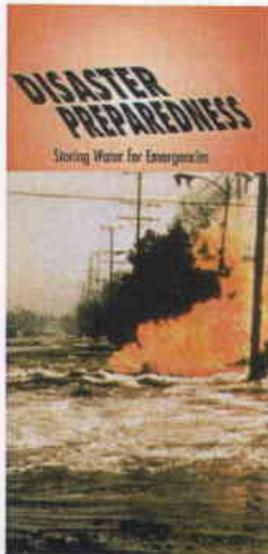
AWWA Conservation Pamphlets



**Preventing Floods and Leaks in Your Home** emphasizes the importance of locating a master valve and discusses where it might be. It also deals with faucet, toilet, and hose leaks (see figure 3.3).

**Disaster Preparedness, Storing Water for Emergencies** addresses four important emergency questions; How much water should be stored, How long can tap water be stored safely, What is a boil water order, and How will I know when the water is safe again (see figure 3.4).

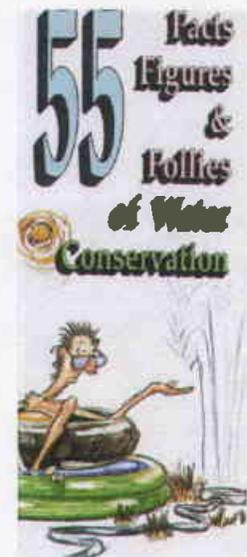
**FIGURES 3.4, 3.5 and 3.6**  
AWWA Conservation Pamphlets



**25 Facts About Water** is a list of 25 water facts that encourage conservation (see figure 3.5).

**Lets Learn About the Water Cycle** diagrams the seven stages of the water cycle (see figure 3.6).

**FIGURES 3.7, 3.8, and 3.9**  
AWWA Conservation Pamphlets



**Its a Natural** makes suggestions regarding landscape including planning, design, soils, and irrigation (see figure 3.7).

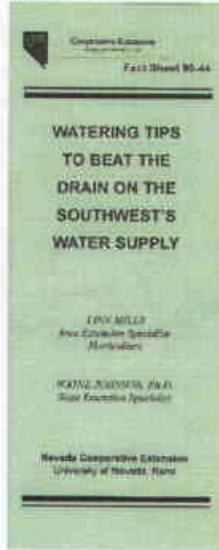
**Water Conservation at Home** discusses in-home conservation practices for bathroom, kitchen, and outdoor water use (see figure 3.8).

**55 Facts Figures & Follies of Water Conservation** is similar to "25 Facts about Water" but it provides a bit more information (see figure 3.9).

In addition to the above mentioned AWWA publications, The University of Nevada Cooperative Extension publishes Fact Sheets that encourage conservation. Fact Sheet 90-09 "Making a Little Water Go a Long Way in Your Home" contains residential conservation tips (see figure 3.10), Fact Sheet 90-40 "Watering Tips to Beat the Drain on the Southwest's Water Supply" provides tips to make landscapes more water efficient (see figure 3.11) and Fact Sheet 91-32 is a list of low water-use plants for southern Nevada (see figure 3.12).

**FIGURES 3.10, 3.11, and 3.12**

**University of Nevada Cooperative Extension Fact Sheets**



## APPENDIX B – CONSERVATION MEASURES

Conservation measures are divided into two types: (1) Hardware/Equipment and (2) Behavioral/Managerial. Each of these is subdivided into five categories of application: (1) Residential, (2) Landscape, (3) Industrial, Commercial, and Institutional (ICI) (4) Agricultural, and (5) Purveyor. The following conservation measures will be classified first by application and then by type.

### B.1 RESIDENTIAL CONSERVATION MEASURES

#### B.1.1 Behavioral Measures

B.1.1.1 Residential Water Audits. Water audits could target high use customers first and then be offered to all customers. The following elements should be part of an effective audit.

- Purpose for the audit.
- Estimation of use for all fixtures and appliances.
- Check for and repair leaks.
- Evaluation of Landscape (See “Landscape Conservation Measures)
- Evaluation of outdoor water use.
- Evaluate efficiency measures.
- Educate customers using available flyers

An audit should take no more than 30 to 45 minutes.

B.1.1.2 Additional Measures. The sample pamphlets in Appendix A include additional behavioral conservation measures.

#### B.1.2 Hardware/Equipment Measures

The following is a list of devices/practices that will reduce water consumption in the home.

Measure	Description
<b><i>Bathroom/Kitchen Fixtures</i></b>	
Low-flow toilets	1.6 gallons per flush
Toilet retrofit devices	Bladders (bags), dams, early close flappers, other hardware and adjustments
Toilet leak repairs	Includes detection (dye tabs) and replacement of worn parts.
Low-volume shower heads	2.5 gallons per minute @ 80 psi
Showerhead retrofit devices	Includes temporary cutoff valves and restrictors.
Low-volume faucets	2.5 gallons per minute @ 80 psi
Faucet retrofit devices	Includes aerators, activation sensors, self closing and metered valves
Faucet maintenance	Includes washer replacement, repacking, tightening, and cleaning aerators
Water pressure reduction	Only needed if house pressure exceeds what's required
<b><i>High Efficiency Appliances</i></b>	
Clothes washers	27 gallons per load
Dish washers	4.5 gallons per load

## B.2 LANDSCAPE CONSERVATION MEASURES

### B.2.1 Behavioral Measures

B.2.1.1 Landscape Water Audits. Landscape water audits should be conducted on park and golf course irrigation systems and could be considered an option on residential irrigation systems, targeting high-volume users.

- Purpose for the audit.
- Estimation of outdoor use based on meter records.
- Check for and repair leaks.
- Evaluation of Landscape (size, soil, amount of turf, types of plants)
- Evaluation of irrigation system (Timers, Use of drip, Precipitation amounts).
- Efficiency recommendations.
- Educate customers using available flyers

A residential landscape audit should take no more than an hour. Parks and golf courses could take substantially longer.

B.2.1.2 Xeriscape™. Xeriscape is a method of landscaping that employs low-water use plants, turf, ground covers, shrubs and trees. It includes careful planning, soil analysis, and irrigation system design.

B.1.1.3 Additional Measures. The sample pamphlets in Appendix A include additional behavioral conservation measures.

### B.2.2 Hardware/Equipment Measures

Landscape hardware measures consist of two basic groups: (1) Landscape materials and (2) irrigation equipment.

Measure	Description
<b><i>Landscape Materials</i></b>	
Trees, plants, and grass	Should be well suited to climate and altitude and be drought tolerant
Organic mulch	Grass clippings, leaves, wood chips, bark, and pine needles. Organic mulches help to retain soil moisture and keep ground cool around plants.
Inorganic mulch	Boulders, gravel, pavers, decomposed granite, and stepping stones. Inorganic mulches are generally more for decorative purposes but they reduce the amount of trees, plants, and turf thereby conserving water.
Compost	Made of manure or biosolids and wood, straw, grass, and leaves. Helps plants stay healthy and retains moisture in the soil.
<b><i>Irrigation Equipment</i></b>	
Valves	Should be sized to meet requirements and checked periodically for leaks
Sprinkler Heads	Should match water volume requirements of area being irrigated.
Sprinkler Nozzles	Should have proper arc of coverage and proper trajectory.
Irrigation Controllers	Should have required number of stations, programs, and starts. Also rain delays and sensor terminals.
Drip irrigation	Insures water is directed to where it's needed

## B.3 INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL (ICI) CONSERVATION MEASURES

### B.3.1 Behavioral and Hardware/Equipment Measures

B.3.1.1 ICI Water Audits. Since ICI water audits can require a substantial amount of time (4 hours or more), it may be necessary to have a private engineering firm hired by the water user conduct the audit. There is incentive for ICI customers to pay for audits since the results of an audit could translate into substantial savings. An ICI water audit should include the following elements:

- Support from ICI owners, managers, and employees
- Survey/Estimation of facility use based on meter records.
- Calculation of water-related costs.
- Evaluation of efficiency measures.
- Evaluation of payback periods for measures.
- Efficiency recommendations and implementation.
- Tracking and reporting system.

B.3.1.2 Manual Washing. Manual washing is cleaning done on surfaces with hoses and cloths.

#### MANUAL WASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Surfaces should be swept or brushed off before using water to clean.</li> </ul>	<ul style="list-style-type: none"> <li>• High pressure low-volume hoses with automatic shut-off nozzles</li> <li>• High-pressure pumps, steam cleaners.</li> </ul>

B.3.1.3 Vehicle Washing. Vehicle washing includes manual washing and automated car washes or a combination of both.

#### VEHICLE WASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Limit number of spray nozzles and set flow rates at lowest volume and pressure required.</li> <li>• Adjust nozzles in automated systems so that they take full advantage of gravity and position. Also make sure water shuts off after vehicles have passed.</li> <li>• Increase conveyor speeds or reduce rinse cycle time.</li> <li>• Sweep wash area before using water to clean.</li> <li>• Establish a regular maintenance schedule that includes checking for leaks and making repairs.</li> </ul>	<ul style="list-style-type: none"> <li>• Recycling systems. These would include filters and storage tanks.</li> <li>• High pressure pumping systems.</li> </ul>

B.3.1.4 Kitchens and Restaurants. Kitchen and restaurant conservation is divided into four areas of application; 1. Food and drink preparation, 2. Dishwashing, 3. Garbage disposal and scraping trough, and 4. Ice making.

## FOOD AND DRINK PREPARATION

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Presoak and wash food service articles in basins instead of running water.</li> <li>• Reduce thawing of food with hot water unless required by law. If required use lower flow.</li> <li>• Avoid running water to melt ice in sinks.</li> <li>• Use full loads in dishwashers and other automated equipment.</li> <li>• Serve water only when requested by customers.</li> </ul>	<ul style="list-style-type: none"> <li>• Low-volume faucets</li> <li>• Hands-free foot pedal valves for faucets</li> <li>• On demand hot water dispensers</li> </ul>

## DISHWASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Presoak utensils, dishes, and pots and pans in basins of water instead of using running water prior to loading dishwashing machines.</li> <li>• Scrape food off of plates rather than use running water.</li> <li>• Operate scraping troughs only while dishes are actually being washed.</li> <li>• Assess the water efficiency of the current dishwashing system to determine where improvements might be made.</li> <li>• Always wash full loads in automated machines.</li> <li>• Operate conveyor type dishwashers only when dishes are actually passing through the machine.</li> <li>• Verify that the dishwashing equipment is using the minimum amount of flow recommended by the manufacturer.</li> <li>• Since many older automated dishwashing systems are neither energy nor water efficient, evaluate the cost of retrofitting or replacing existing equipment.</li> <li>• Turn dishwashers off when not in use.</li> <li>• Routinely check all dishwashing equipment to ensure there are no leaks.</li> <li>• Post signs requesting that personnel minimize their use of utensils, dishes, and pots and pans to save water.</li> </ul>	<ul style="list-style-type: none"> <li>• Manual pre-wash sprayers with "dead man" shut off controls.</li> <li>• Low-flow spray heads on all sprayers.</li> <li>• New water efficient dishwashing equipment.</li> <li>• Electronic eye sensors that shut off conveyor type systems when dishes are not passing through the machine.</li> </ul>

### GARBAGE DISPOSER AND SCRAPING TROUGH

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Eliminate disposers and troughs.</li> <li>• Use the minimum acceptable flow rate on all machines.</li> <li>• Reuse wastewater in the mixing chamber of the disposer.</li> </ul>	<ul style="list-style-type: none"> <li>• Garbage strainers (instead of disposers)</li> <li>• Sensors that detect the amount of flow in a disposer and regulate flow accordingly.</li> <li>• Solenoid valves that turn water off when the disposer is off.</li> <li>• Flow regulators for disposer supply lines.</li> </ul>

### ICE MAKERS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Use the minimum flow rate recommended by the manufacturer on water cooled icemakers.</li> <li>• Adjust machines to produce ice only when it's needed.</li> </ul> <p>Collect spent cooling water and reuse it for non-potable purposes.</p>	<ul style="list-style-type: none"> <li>• Air-cooled icemakers.</li> <li>• Re-circulating systems for water-cooled icemakers.</li> <li>• Ice flake machines that use less bleed off than cube machines.</li> </ul>

B.3.1.5 Laundries and Laundromats. This section includes measures that are applicable in hotels, motels, hospitals, nursing homes, diaper services, restaurants, and coin operated Laundromats.

### LAUNDRIES AND LAUNDROMATS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Operate equipment with full loads only.</li> <li>• Reduce water levels for partial loads.</li> <li>• Back flush filters or softeners only when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>• Computer controlled rinse water reclamation systems.</li> <li>• Wash and rinse water treatment and reclamation systems.</li> <li>• Continuous batch washers.</li> <li>• Ozone laundry systems.</li> <li>• Horizontal axis washers.</li> </ul>

B.3.1.6 Swimming Pools. The measures in this section can be applied to commercial and residential swimming pools.

### SWIMMING POOLS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Limit the frequency of pool refilling.</li> <li>• Cover the pool with an insulated cover when not in use to reduce losses due to heat and evaporation.</li> <li>• Reduce the level of the pool to avoid losses due to splashing.</li> <li>• Lower the pool temperature.</li> <li>• Back wash filters only when necessary. If backwash is timed, verify that frequency is efficient.</li> <li>• Regularly check pool for leaks and cracks. Keep pool and filter clean to avoid unnecessary backwashing.</li> </ul>	<p>There are no special equipment measures that would help conserve water in pools. It is important however that available equipment is efficient and used properly.</p>

B.3.1.7 Cooling Systems. This section includes measures for three types of cooling systems: 1. Single-pass, 2. Evaporative, and 3. Equipment. Single-pass cooling uses fresh water to cool without re-circulating any of the water used in the first pass. Evaporative coolers are used for cooling in commercial and residential applications and are commonly known as swamp coolers. Equipment cooling includes both single-pass and re-circulating systems that are used to cool equipment and machinery.

**SINGLE-PASS COOLING**

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Reuse water for landscaping, vehicle washing, or another cooling application that allows for water to be at a higher temperature.</li> <li>• Eliminate single-pass systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Air-cooled equipment (i.e. compressors, pumps, icemakers, etc...)</li> <li>• Automatic controls that insure coolers only operate when needed.</li> </ul>

**EVAPORATIVE COOLING**

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Regularly check for leaks in hoses and pan.</li> <li>• Replace pads at least annually.</li> <li>• Shut cooler off when building is unoccupied.</li> <li>• Annually service the equipment by oiling moving parts and cleaning off accumulated scale or corrosion.</li> </ul>	<p>There are currently no equipment measures for evaporative coolers. The design of the coolers is relatively simple.</p>

**EQUIPMENT COOLING**

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Reuse water in single pass systems for other cooling purposes. Examples of reuse include cooling molten materials, landscape, or boiler make-up water.</li> <li>• Replace al single pass cooling systems with closed-loop systems or replace water-cooled equipment with air-cooled.</li> </ul>	

B.3.1.8 Heating Systems. This section deals with conservation measures for boilers and steam generators which are used to heat large buildings and multiple-building facilities.

## HEATING SYSTEMS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Regularly inspect systems for leaks and make repairs.</li> <li>• Insulate all piping.</li> <li>• Limit boiler bleed-off to a level that satisfies water quality requirements.</li> <li>• Discharge blow-down into an expansion tank instead of using cold water to cool it.</li> </ul>	<ul style="list-style-type: none"> <li>• Flow meters for make-up and blow-down valves.</li> <li>• Automatic controls to discharge blow-down.</li> </ul>

B.3.1.9 Leaks and Water Losses. This section covers water conservation measures relating to leaks and losses.

## LEAKS AND WATER LOSSES

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> <li>• Regularly check for leaks at all water connections. Keep in mind that higher pressure applications have more incidence of leakage.</li> <li>• Regularly check all vessels that contain water for cracks or bad seals.</li> <li>• Regularly check all heating and cooling systems.</li> <li>• Repair any leaks that are discovered.</li> </ul>	<ul style="list-style-type: none"> <li>• Leak detection equipment. This could include sonic or probe type equipment.</li> <li>• Any equipment used to stop a leak. This would depend on the material of the pipe or vessel that has a leak.</li> </ul>

B.3.1.10 ICI Maintenance Practices. This section reemphasizes maintenance conservation measures for ICI facilities that have been mentioned in previous sections. These measures should become standard procedure at all ICI facilities.

- Create a maintenance schedule that includes schedules for leak detection inspections and meter reading, and repair procedures.
- Monitor water-use records keeping track of any increases or decreases in use.
- Conduct water audits every one to three years.
- Shut off supply lines to areas that are not being used.
- Install pressure reducers where feasible.
- Keep a maintenance schedule to clean cooling and heating equipment regularly.
- Recycle and reuse water when feasible.
- Insulate all hot water pipes.
- Replace old equipment with water saving equipment.
- Install timers wherever possible.
- Educate employees on water saving techniques.

## B.4 GENERAL CONSERVATION MEASURES

This list of conservation behaviors and is divided into four parts: Home, Landscaping, Community, and Miscellaneous.

### HOME BEHAVIORS

1. When washing dishes by hand, don't let the water run while rinsing. Fill one sink with wash water and the other with rinse water.

2. Evaporative coolers require a seasonal maintenance checkup. For more efficient cooling, check your evaporative cooler annually.
3. Run your washing machine and dishwasher only when they are full and you could save 1000 gallons a month.
4. Use the garbage disposal sparingly. Compost instead and save gallons every time.
5. Keep a pitcher of water in the refrigerator instead of running the tap for cold drinks, so that every drop goes down you not the drain.
6. Check your water meter and bill to track your water usage.
7. Wash your produce in the sink or a pan that is partially filled with water instead of running water from the tap.
8. Use a broom instead of a hose to clean your driveway or sidewalk and save 80 gallons of water every time.
9. If your shower can fill a one-gallon bucket in less than 20 seconds, then replace it with a water efficient showerhead.
10. Collect the water you use for rinsing produce and reuse it to water houseplants.
11. We're more likely to notice leaky faucets indoors, but don't forget to check outdoor faucets, pipes, and hoses for leaks.
12. When you shop for a new appliance, consider one offering cycle and load size adjustments. They are more water and energy-efficient than older appliances.
13. Time your shower to keep it under 5 minutes. You'll save up to 1000 gallons a month.
14. Install low-volume toilets.
15. When you clean your fish tank, use the water you've drained on your plants. The water is rich in nitrogen and phosphorus, providing you with a free and effective fertilizer.
16. Put food coloring in your toilet tank. If it seeps into the toilet bowl, you have a leak. It's easy to fix, and you can save more than 600 gallons a month.
17. Plug the bathtub before turning the water on, and then adjust the temperature as the tub fills up.
18. Designate one glass for your drinking water each day. This will cut down on the number of times you run your dishwasher.
19. Don't use running water to thaw food.
20. Grab a wrench and fix that leaky faucet. It's simple, inexpensive, and can save 140 gallons a week.
21. When doing laundry, match the water level to the size of the load.
22. Teach your children to turn the faucets off tightly after each use.
23. Before you lather up, install a low-flow showerhead. They're inexpensive, easy to install, and can save your family more than 500 gallons a week.
24. Soak your pots and pans instead of letting the water run while you scrape them clean.

25. Make sure you know where your master water shut-off valve is located. This could save gallons of water and damage to your home if a pipe were to burst.
26. Turn off the water while you brush your teeth and save 4 gallons a minute. That's 200 gallons a week for a family of four.
27. Make sure your toilet flapper doesn't stick open after flushing.
28. Make sure there are aerators on all of your faucets.
29. Install an instant water heater on your kitchen sink so you don't have to let the water run while it heats up. This will also reduce heating costs for your household.
30. Cut back on rinsing if your dishwasher is new. Newer models clean more thoroughly than older ones.
31. Bathe your young children together.
32. Winterize outdoor spigots when temps dip to 20 degrees F to prevent pipes from bursting or freezing.
33. Insulate hot water pipes so you don't have to run as much water to get hot water to the faucet.
34. Drop that tissue in the trash instead of flushing it and save gallons every time.
35. If your toilet was installed prior to 1980, place a toilet dam or bottle filled with water in your toilet tank to cut down on the amount of water used for each flush. Be sure these devices do not interfere with operating parts.
36. Install water softening systems only when necessary. Save water and salt by running the minimum number of regenerations necessary to maintain water softness.
37. Wash clothes only when you have a full load and save up to 600 gallons each month.
38. Listen for dripping faucets and toilets that flush themselves. Fixing a leak can save 500 gallons each month.
39. Cook food in as little water as possible. This will also retain more of the nutrients.
40. Turn the water off while you shampoo and condition your hair and you can save more than 50 gallons a week.
41. Choose new water-saving appliances, like washing machines that save up to 20 gallons per load.
42. Select the proper size pans for cooking. Large pans require more cooking water than may be necessary.
43. Turn off the water while you shave and you can save more than 100 gallons a week.
44. To save water and time, consider washing your face or brushing your teeth while in the shower.
45. For hanging baskets, planters and pots, place ice cubes under the moss or dirt to give your plants a cool drink of water and help eliminate water overflow.
46. Throw trimmings and peelings from fruits and vegetables into your yard compost to prevent from using the garbage disposal.
47. Keep a bucket in the shower to catch water as it warms up or runs. Use this water to flush toilets or water plants.

48. When you are washing your hands, don't let the water run while you lather.
49. Pre-treat stains before washing clothes to avoid re-washing.
50. Use the shortest wash cycle for lightly soil cloths.
51. Check washing machine hoses regularly for leaks.
52. Do not pre-rinse dishes except in cases of sticky or burn-on food.
53. Scrape off food with a utensil or used paper napkin when pre-cleaning for dishwasher.

#### **LANDSCAPE BEHAVIORS**

1. Check your sprinkler system frequently and adjust sprinklers so only your lawn is watered and not the house, sidewalk, or street.
2. Avoid planting turf in areas that are hard to water such as steep inclines and isolated strips along sidewalks and driveways.
3. Plant during the spring or fall when the watering requirements are lower.
4. Minimize evaporation by watering during the early morning hours, when temperatures are cooler and winds are lighter.
5. Use a layer of organic mulch around plants to reduce evaporation and save hundreds of gallons of water a year.
6. Divide your watering cycle into shorter periods to reduce runoff and allow for better absorption every time you water.
7. Only water your lawn when needed. You can tell this by simply walking across your lawn. If you leave footprints, it's time to water.
8. Adjust your lawn mower to a higher setting. Longer grass shades root systems and holds soil moisture better than a closely clipped lawn.
9. Use the sprinkler for larger areas of grass. Water small patches by hand to avoid waste.
10. Use porous materials for walkways and patios to keep water in your yard and prevent wasteful runoff.
11. Direct downspouts and other runoff towards shrubs and trees, or collect and use for your garden.
12. Install a rain shut-off device on your automatic sprinklers to eliminate unnecessary watering.
13. Choose a water-efficient drip irrigation system for trees, shrubs and flowers. Watering at the roots is very effective, be careful not to over water.
14. Reduce the amount of grass in your yard by planting shrubs and ground cover with rock and granite mulching.
15. Remember to check your sprinkler system valves periodically for leaks and keep the heads in good shape.
16. Don't water your lawn on windy days. After all, sidewalks and driveways don't need water.
17. Water your plants deeply but less frequently to create healthier and stronger landscapes.

18. When watering grass on steep slopes, use a soaker hose to prevent wasteful runoff.
19. Group plants with the same watering needs together to get the most out of your watering time.
20. Remember to weed your lawn and garden regularly. Weeds compete with other plants for nutrients, light, and water.
21. While fertilizers promote plant growth, they also increase water consumption. Apply the minimum amount of fertilizer needed.
22. Avoid installing ornamental water features and fountains that spray water into the air. Trickling or cascading fountains lose less water to evaporation.
23. Buy a rain gauge to track how much rain or irrigation your yard receives. Check with your local water agency to see how much rain is needed to skip an irrigation cycle.
24. Teach your family how to shut off your automatic watering systems. Turn sprinklers off if the system is malfunctioning or when a storm is approaching.
25. Set a kitchen timer when watering your lawn or garden with a hose.
26. Next time you add or replace a flower or shrub, choose a low water use plant for year-round landscape color and save up to 550 gallons each year.
27. Use a screwdriver as a soil probe to test soil moisture. If it goes in easily, don't water. Proper lawn watering can save thousands of gallons of water annually.
28. Avoid over-seeding your lawn with winter grass. Once established, ryegrass needs water every three to five days, whereas dormant Bermuda grass needs water only once a month.
29. Landscape with Xeriscape trees, plants and groundcovers. Call your local conservation office for more information about these water thrifty plants.
30. If you have an evaporative cooler, direct the water drain to a flowerbed, tree, or your lawn.
31. Leave lower branches on trees and shrubs and allow leaf litter to accumulate on top of the soil. This keeps the soil cooler and reduces evaporation.
32. Start a compost pile. Using compost when you plant adds water-holding organic matter to the soil.
33. Use sprinklers that throw big drops of water close to the ground. Smaller drops of water and mist often evaporate before they hit the ground.
34. More plants die from over-watering than from under-watering. Be sure only to water plants when necessary.
35. Water only as rapidly as the soil can absorb the water.
36. Aerate your lawn. Punch holes in your lawn about six inches apart so water will reach the roots rather than run off the surface.

### **COMMUNITY BEHAVIORS**

1. Encourage your school system and local government to help develop and promote a water conservation ethic among children and adults.
2. Make suggestions to your employer to save water (and dollars) at work.

3. Support projects that use reclaimed wastewater for irrigation and other uses.
4. Encourage your friends and neighbors to be part of a water-conscious community.
5. Pick-up the phone and report significant water losses from broken pipes, open hydrants and errant sprinklers to the property owner or your water management district.

#### **MISCELLANEOUS BEHAVIORS**

1. Install covers on pools and spas and check for leaks around your pumps.
2. Periodically check your pool for leaks if you have an automatic refilling device.
3. Use a commercial car wash that recycles water.
4. Don't buy recreational water toys that require a constant flow of water.
5. Use a grease pencil to mark the water level of your pool at the skimmer. Check the mark 24 hours later. Your pool should lose no more than ¼ inch each day.
6. When the kids want to cool off, use the sprinkler in an area where your lawn needs it the most.
7. Make sure your swimming pools, fountains, and ponds are equipped with re-circulating pumps.
8. Bathe your pets outdoors in an area in need of water.
9. While staying in a hotel or even at home, consider reusing your towels.
10. When backwashing your pool, consider using the water on your landscaping.

**WATER**

- [www.amsa-cleanwater.org](http://www.amsa-cleanwater.org)
- [www.energystar.gov](http://www.energystar.gov)

**DROUGHT**

- [DroughtMonitor@ndmc.unl.edu](mailto:DroughtMonitor@ndmc.unl.edu)

**LANDSCAPE**

- [www.usda.gov/news/garden.htm](http://www.usda.gov/news/garden.htm)
- [www.tmwlandscapeguide.com/landscape\\_guide/interactive/index.php](http://www.tmwlandscapeguide.com/landscape_guide/interactive/index.php)

**EDUCATION**

- [www.wateruseitwisely.com](http://www.wateruseitwisely.com)
- [www.washoeet.dri.edu/](http://www.washoeet.dri.edu/)

**INSTITUTIONAL**

- [www.douglascountynv.gov/sites/main/index.cfm](http://www.douglascountynv.gov/sites/main/index.cfm)
- [www.lvwd.com](http://www.lvwd.com)
- [www.snwa.com](http://www.snwa.com)
- [www.co.washoe.nv.us/water\\_dept/rwpc/regionalplm](http://www.co.washoe.nv.us/water_dept/rwpc/regionalplm)
- [www.tmh20.com](http://www.tmh20.com)
- [www.cabq.gov](http://www.cabq.gov)
- [www.ci.phoenix.az.us/WATER/wtrteach.html](http://www.ci.phoenix.az.us/WATER/wtrteach.html)
- [www.owue.water.ca.gov/leak/faq/faq.cfm](http://www.owue.water.ca.gov/leak/faq/faq.cfm)

**LEAK DETECTION**

- [www.who.int/docstore/water\\_sanitation\\_health/leakage/begin.html](http://www.who.int/docstore/water_sanitation_health/leakage/begin.html)

**RESOLUTION NO. 2007R-012**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE ZEPHYR WATER UTILITY DISTRICT**

**WHEREAS**, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

**WHEREAS**, current water rates, and connection charges for the Zephyr Water Utility District are not sufficient to fund the operation of the system; and

**WHEREAS**, capital improvements are necessary to bring the water system into compliance with state and federal drinking water standards.

**NOW, THEREFORE, BE IT RESOLVED** by the Douglas County Board of Commissioners as follows:

**SECTION 1.** Resolutions 99R-092 and 95R-01 are repealed in their entirety.

**SECTION 2.** Monthly water rates for the Zephyr Water Utility District shall be established as follows:

**Monthly Water Rates**

Account Class	Meter Size	Monthly Fixed Charge	Volume Charge <sup>1</sup> > 10 kgal per month
Residential	5/8" or 3/4"	\$66.43	
	1"	\$166.08	
	1 1/2"	\$332.15	
	2"	\$531.44	
Commercial	5/8" or 3/4"	\$78.12	
	1"	\$195.29	
	1 1/2"	\$390.59	
	2"	\$624.94	
	3"	\$1,249.87	
Irrigation	5/8" or 3/4"	\$65.00	\$1.89
	1"	\$120.00	\$1.89
	1 1/2"	\$200.00	\$1.89
	2"	\$375.00	\$1.89
	3"	\$640.00	\$1.89
	4"	\$1,000.00	\$1.89

<sup>1</sup> Volume charge shall be based on each 1,000 gallons used  
Irrigation fixed charge includes water allowance of 10,000 gallon per month

**RESOLUTION NO. 2005R-051**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE FAIRGROUNDS WATER SYSTEM**

WHEREAS, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

WHEREAS, current water rates, and connection charges for the Fairgrounds Water System are not sufficient to fund the operation of the system; and

WHEREAS, the Fairgrounds water service area has been expanded, as shown in Exhibit A, to allow extension of water service to developments not currently served by the system.

NOW, THEREFORE, BE IT RESOLVED by the Douglas County Board of Commissioners as follows:

SECTION 1. Resolution 2001R-025 is repealed in its entirety, and Resolution 2004R-039 be amended to delete Sunrise Estates, as shown in Exhibit A, page 2 of 2, from the East Valley water service area.

SECTION 2. Monthly residential, commercial/industrial, and irrigation rates for the Fairgrounds Water System shall be established as follows:

**Monthly Residential, Commercial, and Irrigation Rates**

Account Class	Meter	Monthly Fixed Charge	Volume Charge		
			Block 1 0 to 8,000	Block 2 8,001 to 24,000	Block 3 24,001 +
Residential	5/8"	\$15.00	\$0.95	\$1.50	\$2.09
	3/4"	\$15.00	\$0.95	\$1.50	\$2.09
	1"	\$37.50	\$0.95	\$1.50	\$2.09
	1 1/2"	\$75.00	\$0.95	\$1.50	\$2.09
	2"	\$120.00	\$0.95	\$1.50	\$2.09
Commercial	5/8"	\$19.46	\$0.95	\$1.18	\$1.52
	3/4"	\$19.46	\$0.95	\$1.18	\$1.52
	1"	\$48.66	\$0.95	\$1.18	\$1.52
	1 1/2"	\$95.82	\$0.95	\$1.18	\$1.52
	2"	\$152.42	\$0.95	\$1.18	\$1.52
	3"	\$311.36	\$0.95	\$1.18	\$1.52
Irrigation	5/8"	\$52.91	\$1.28	\$1.28	\$1.28
	3/4"	\$52.91	\$1.28	\$1.28	\$1.28
	1"	\$132.28	\$1.28	\$1.28	\$1.28
	1 1/2"	\$263.08	\$1.28	\$1.28	\$1.28
	2"	\$420.03	\$1.28	\$1.28	\$1.28
	3"	\$846.56	\$1.28	\$1.28	\$1.28
Fairgrounds	NA	\$338.05	\$1.35	\$1.35	\$1.35

**RESOLUTION NO. 2004R-040**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE WEST VALLEY WATER SYSTEM**

**WHEREAS**, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

**WHEREAS**, current water rates, and connection charges for the West Valley Water System are not sufficient to fund the operation of the system; and

**WHEREAS**, the service area has been expanded to allow extension of water service to developments not currently served by the system.

**NOW, THEREFORE, BE IT RESOLVED** by the Douglas County Board of Commissioners as follows:

**SECTION 1.** Resolutions 95R-046 and 98R-083 are repealed in their entirety.

**SECTION 2.** Monthly residential, commercial/industrial, and irrigation rates for the West Valley Water System shown in Exhibit A shall be established as follows:

**Monthly Residential, Commercial, and Irrigation Rates**

Account Class	Meter	Monthly Fixed Charge	Volume Charge		
			Block 1 0 to 8,000	Block 2 8,001 to 24,000	Block 3 24,001 +
Residential	5/8"	\$13.00	\$0.90	\$1.28	\$1.80
	3/4"	\$13.00	\$0.90	\$1.28	\$1.80
	1"	\$25.62	\$0.90	\$1.28	\$1.80
Commercial	5/8"	\$12.00	\$0.82	\$1.25	\$1.75
	3/4"	\$12.00	\$0.82	\$1.25	\$1.75
	1"	\$23.90	\$0.82	\$1.25	\$1.75
	1 1/2"	\$43.74	\$0.82	\$1.25	\$1.75
	2"	\$67.55	\$0.82	\$1.25	\$1.75
	3"	\$131.04	\$0.82	\$1.25	\$1.75
	4"	\$202.47	\$0.82	\$1.25	\$1.75
Irrigation	5/8"	\$9.72	\$0.62	\$0.62	\$0.62
	3/4"	\$9.72	\$0.62	\$0.62	\$0.62
	1"	\$18.33	\$0.62	\$0.62	\$0.62
	1 1/2"	\$32.68	\$0.62	\$0.62	\$0.62
	2"	\$49.90	\$0.62	\$0.62	\$0.62
	3"	\$95.83	\$0.62	\$0.62	\$0.62
	4"	\$147.50	\$0.62	\$0.62	\$0.62

**RESOLUTION NO. 2004R-039**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE EAST VALLEY WATER SYSTEM**

**WHEREAS**, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

**WHEREAS**, current water rates, and connection charges for the East Valley Water System are not sufficient to fund the operation of the system.

**WHEREAS**, the service area has been expanded to allow extension of water service to developments not currently served by the system.

**NOW, THEREFORE, BE IT RESOLVED** by the Douglas County Board of Commissioners as follows:

**SECTION 1.** Resolution 2000R-033, 2000R-084 and 2002R-075 are repealed in their entirety.

**SECTION 2.** Monthly residential, commercial/industrial, and irrigation rates for the East Valley Water System as shown in Exhibit A shall be established as follows:

**Monthly Residential, Commercial, and Irrigation Rates**

Account Class	Meter	Monthly Fixed Charge	Volume Charge		
			Block 1 0 to 8,000	Block 2 8,001 to 24,000	Block 3 24,001 +
Residential	5/8"	\$13.12	\$0.90	\$1.44	\$2.04
	3/4"	\$13.12	\$0.90	\$1.44	\$2.04
	1"	\$27.22	\$0.90	\$1.44	\$2.04
Commercial	5/8"	\$16.97	\$0.90	\$1.25	\$1.40
	3/4"	\$16.97	\$0.90	\$1.25	\$1.40
	1"	\$36.85	\$0.90	\$1.25	\$1.40
	1 1/2"	\$69.98	\$0.90	\$1.25	\$1.40
	2"	\$109.74	\$0.90	\$1.25	\$1.40
	3"	\$215.76	\$0.90	\$1.25	\$1.40
	4"	\$335.03	\$0.90	\$1.25	\$1.40
6"	\$848.50	\$0.90	\$1.25	\$1.40	
Irrigation	5/8"	\$7.75	\$1.25	\$1.25	\$1.25
	3/4"	\$7.75	\$1.25	\$1.25	\$1.25
	1"	\$7.75	\$1.25	\$1.25	\$1.25
	1 1/2"	\$13.66	\$1.25	\$1.25	\$1.25
	2"	\$18.72	\$1.25	\$1.25	\$1.25
	3"	\$32.23	\$1.25	\$1.25	\$1.25
	4"	\$47.42	\$1.25	\$1.25	\$1.25

**RESOLUTION NO. 2007R-011**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE CAVE ROCK/UPPAWAY AND SKYLAND WATER SYSTEMS**

**WHEREAS**, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

**WHEREAS**, current water rates for the Cave Rock/Uppaway Water System are not sufficient to fund the operation of the system; and

**WHEREAS**, capital improvements are necessary to bring the Cave Rock/Uppaway and Skyland water systems into compliance with state and federal drinking water standards.

**NOW, THEREFORE, BE IT RESOLVED** by the Douglas County Board of Commissioners as follows:

**SECTION 1.** Resolution 2003R-037 is repealed in it's entirety.

**SECTION 2.** Monthly water rates for the Cave Rock/Uppaway Water System shall be established as follows:

**Cave Rock/Uppaway  
Flat Monthly Residential and Metered Commercial/Irrigation Rates**

Account Class	Meter Size	Monthly Fixed Charge	Volume Charge <sup>1</sup>		
			Block 1 0 to 8000	Block 2 8001 to 24,000	Block 3 24,001 +
Residential	5/8" or 3/4"	\$135.28			
	1"	\$338.20			
	1 1/2"	\$676.40			
	2"	\$1,082.24			
Commercial	5/8" or 3/4"	\$61.71	4.21	4.54	4.88
	1"	\$154.28	4.21	4.54	4.88
	1 1/2"	\$308.55	4.21	4.54	4.88
	2"	\$493.68	4.21	4.54	4.88
	3"	\$987.36	4.21	4.54	4.88
	4"	\$1,542.75	4.21	4.54	4.88
Irrigation	5/8" or 3/4"	\$35.59	4.54	4.54	4.54
	1"	\$88.98	4.54	4.54	4.54
	1 1/2"	\$177.95	4.54	4.54	4.54
	2"	\$284.72	4.54	4.54	4.54
	3"	\$569.44	4.54	4.54	4.54
	4"	\$889.75	4.54	4.54	4.54

<sup>1</sup> Volume charge shall be based on each 1,000 gallons used

**Skyland**  
**Per Monthly Residential and Metered Commercial/Irrigation Rates**

	Meter Size	Monthly Fixed Charge	Block 1 0 to 8000	Volume Charge Block 2 8001 to 24,000	Block 3 24,000 +
Residential	5/8"	\$74.70			
	3/4"	\$74.70			
	1"	\$173.78			
	1 1/2"	\$338.90			
	2"	\$537.05			
Commercial	5/8"	\$38.90	\$1.86	\$2.09	\$2.31
	3/4"	\$38.90	\$1.86	\$2.09	\$2.31
	1"	\$83.44	\$1.86	\$2.09	\$2.31
	1 1/2"	\$157.69	\$1.86	\$2.09	\$2.31
	2"	\$246.79	\$1.86	\$2.09	\$2.31
	3"	\$484.38	\$1.86	\$2.09	\$2.31
	4"	\$751.67	\$1.86	\$2.09	\$2.31
Irrigation	5/8"	\$36.40	\$2.09	\$2.09	\$2.09
	3/4"	\$36.40	\$2.09	\$2.09	\$2.09
	1"	\$67.48	\$2.09	\$2.09	\$2.09
	1 1/2"	\$119.27	\$2.09	\$2.09	\$2.09
	2"	\$181.43	\$2.09	\$2.09	\$2.09
	3"	\$347.18	\$2.09	\$2.09	\$2.09
	4"	\$533.64	\$2.09	\$2.09	\$2.09

Volume charge shall be based on each 1,000 gallons used

**SECTION 3.** The connection fee for each equivalent dwelling unit (EDU) charged for connection to the Cave Rock/Uppaway and Skyland Water Systems shall be in accordance with the following schedule:

**Cave Rock/Uppaway and Skyland  
 Connection Fees**

Service Size	Connection Fee
Up to 3/4"	\$6,625
1"	\$16,562
1 1/2"	\$33,125
2"	\$53,000
3"	\$106,000
4"	\$165,625

Service size shall mean the size of the service lateral from the point of connection to a County water main to the meter pit or property line (without a meter pit). A connection fee will be

**RESOLUTION NO. 2005R-052**

**A RESOLUTION ESTABLISHING  
CERTAIN RATES, FEES, AND CHARGES  
FOR THE SHERIDAN ACRES WATER SYSTEM**

**WHEREAS**, the Douglas County Board of Commissioners has directed that rates, fees, and charges be set at levels necessary to fund all operations of an enterprise fund; and

**WHEREAS**, current water rates, and connection charges for the Sheridan Water System are not sufficient to fund the operation of the system; and

**WHEREAS**, capital improvements are necessary to bring the water system into compliance with state and federal drinking water standards.

**NOW, THEREFORE, BE IT RESOLVED** by the Douglas County Board of Commissioners as follows:

**SECTION 1.** Resolution 2005R-009 is repealed in it's entirety.

**SECTION 2.** Monthly water rates for the Sheridan Acres Water System shall be established as follows:

**Monthly Water Rates**

Meter Size	Flat Rate
5/8" or 3/4"	\$135.00
1"	\$312.50
1 1/2"	\$625.00
2"	\$1000.00

**SECTION 3.** The connection fee for each equivalent dwelling unit (EDU) charged for connection to the Sheridan Acres Water System shall be in accordance with the following schedule:

**Connection Fees**

Service Size	Connection Fee
5/8" or 3/4"	\$6,298
1"	\$15,745
1 1/2"	\$31,490
2"	\$50,384

Service size shall mean the size of the service lateral from the point of connection to a County water main to the meter pit. A connection fee will be charged for each individual connection, excluding fire protection services. Connection fees must be paid prior or concurrent with the issuance of the connection permit.

The following list is taken from the Truckee Meadows Water Authority (TMWA) website. More information on these plants, including color photos can be found at [www.tmwandscapeguide.com](http://www.tmwandscapeguide.com).

**PERENNIAL FLOWERS**

- Artemisia species/Sage or Wormwood (Perennial)—water use: Very Low
- Eriogonum umbellatum/Sulfur Flowered Buckwheat (Perennial)—water use: Very Low
- Achillea species/Yarrow (Perennial)—water use:Low
- Agastache cana/Bubblemint (Perennial)—water use:Low
- Aurinia saxatilis/Basket-of-Gold (Perennial)—water use:Low
- Coreopsis species/Tickseed (Perennial)—water use:Low
- Crocus species/Spring Crocus (Perennial)—water use:Low
- Dianthus species/Pinks (Perennial)—water use:Low
- Eschscholzia californica/California poppy (Perennial)—water use:Low
- Gaillardia grandiflora/Blanket Flower (Perennial)—water use:Low
- Iris germanica/Iris germanica (Perennial)—water use:Low
- Linum species/Flax (Perennial)—water use:Low
- Narcissus species/Daffodil or Narcissus (Perennial)—water use:Low
- Nepeta racemosa/Catmint (Perennial)—water use:Low
- Oenothera species/Evening Primrose (Perennial)—water use:Low
- Perovskia atriplicifolia/Russian Sage (Perennial)—water use:Low
- Sedum species/Stonecrop (Perennial)—water use:Low
- Senecio Cineraria/Dusty Miller (Perennial)—water use:Low
- Stachys byzantina/Lamb’s Ears (Perennial)—water use:Low
- Thermopsis montana/No Lupine (Perennial)—water use:Low
- Tulbaghia violacea/Society Garlic (Perennial)—water use:Low
- Alcea rosea/Hollyhock (Perennial)—water use:Moderate
- Antirrhinum majus/Snapdragon (Perennial)—water use:Moderate
- Armeria maritima/Sea Pinks (Perennial)—water use:Moderate
- Aster species/Aster (Perennial)—water use:Moderate
- Echinacea purpurea/Coneflower (Perennial)—water use:Moderate
- Gaura lindheimeri/Gaura (Perennial)—water use:Moderate
- Geranium species/Handy Geranium (Perennial)—water use:Moderate

Gypsophila species/Baby's Breath (Perennial)—water use:Moderate

Hemerocallis hybrids/Daylily (Perennial)—water use:Moderate

Heuchera sanguinea/Coral Bells (Perennial)—water use:Moderate

Iberis sempervirens/Candytuft (Perennial)—water use:Moderate

Kniphofia uvaria/Red Hot Poker (Perennial)—water use:Moderate

Lavandula angustifolia/Lavender (Perennial)—water use:Moderate

Lilium species/Lily (Perennial)—water use:Moderate

N/A/Pussy toes (Perennial)—water use:moderate

Papaver species/Poppy (Perennial)—water use:Moderate

Penstemon species/Beard Tongue (Perennial)—water use:Moderate

Platycodon grandiflorus/Balloon Flower (Perennial)—water use:Moderate

Rudbeckia fulgida/Black-Eyed Susan (Perennial)—water use:Moderate

Salvia Species/Sage or Salvia (Perennial)—water use:Moderate

Saponaria species/Soapwort (Perennial)—water use:Moderate

Tanacetum species/Painted or Michaelmas Daisy (Perennial)—water use:Moderate

Tulipa species/Tulip (Perennial)—water use:Moderate

Veronica spicata/Spike Speedwell (Perennial)—water use:Moderate

Viola species/Violet or Pansy (Perennial)—water use:Moderate

## **GROUNDCOVERS, VINES, AND GRASSES**

Opuntia polyacantha/Prickly Pear Cactus (Groundcovers)—water use:Very Low

Clematis species/Clematis (Groundcovers)—water use:Low

Euphorbia species/Spurge (Groundcovers)—water use:Low

Helictotrichon sempervirens/Blue Oat Grass (Groundcovers)—water use:Low

Hypericum calycinum/Jacob's Ladder or Aaron's Beard (Groundcovers)—water use:Low

Juniperus horizontalis/Groundcover Junipers (Groundcovers)—water use:Low

Lathyrus latifolius/Perennial Sweet Pea (Groundcovers)—water use:Low

Lonicera species/Honeysuckle (Groundcovers)—water use:Low

Panicum virgatum/Switch Grass (Groundcovers)—water use:Low

Polygonum species/Polygonum (Groundcovers)—water use:Low

Santolina species/Lavender Cotton (Groundcovers)—water use:Low

Vinca minor/Dwarf Periwinkle (Groundcovers)—water use:Low

Wisteria sinensis/Chinese Wisteria (Groundcovers)—water use:Low

Zauschneria californica/California Fuschia (Groundcovers)—water use:Low  
Calmagrostis x acutiflora/Feather Reed Grass (Groundcovers)—water use:Moderate  
Campsis radicans/Red Trumpet Creeper (Groundcovers)—water use:Moderate  
Cerastium tomentosum/Snow in Summer (Groundcovers)—water use:Moderate  
Delosperma cooperi/Hardy Purple Ice Plant (Groundcovers)—water use:Moderate  
Hedera helix/Ivy (Groundcovers)—water use:Moderate  
Helianthemum nummularium/Sunrose (Groundcovers)—water use:Moderate  
Mahonia repens/Creeping Mahonia (Groundcovers)—water use:Moderate  
N/A/Northern seacats (Groundcovers)—water use:moderate  
Phlox subulata/Moss Pink (Groundcovers)—water use:Moderate  
Potentilla neumanniana/Cinquefoil (Groundcovers)—water use:Moderate  
Sedum species/Stonecrop (Groundcovers)—water use:Moderate  
Thymus species/Thyme (Groundcovers)—water use:Moderate

## SHRUBS

Artemisia tridentata var. tridentata/Big Sagebrush (Shrubs)—water use:Very Low  
Atriplex canescens/Four Wing Saltbrush (Shrubs)—water use:Very Low  
Chrysothamnus nauseosus/Rubber Rabbitbrush (Shrubs)—water use:Very Low  
Amelanchier species/Serviceberry or Juneberry (Shrubs)—water use:Low  
Aronia species/Chokeberry (Shrubs)—water use:Low  
Berberis species/Barberry (Shrubs)—water use:Low  
Caragana species/Peashrub (Shrubs)—water use:Low  
Caryopteris x clandonensis/Blue Mist Spiraea (Shrubs)—water use:Low  
Chaenomeles speciosa/Flowering Quince (Shrubs)—water use:Low  
Cytisus species/Broom (Shrubs)—water use:Low  
Elaeagnus commutata/Silverberry (Shrubs)—water use:Low  
Euonymus species/Euonymus (Shrubs)—water use:Low  
Forestiera neomexicana/New Mexico Privet (Shrubs)—water use:Low  
Genista species/Dwarf Broom (Shrubs)—water use:Low  
Hibiscus syriacus/Rose of Sharon (Shrubs)—water use:Low  
Ligustrum species/Privet (Shrubs)—water use:Low  
Lonicera tatarica/Tatarian Honeysuckle (Shrubs)—water use:Low

Mahonia aquifolium/Oregon Grape (Shrubs)—water use:Low

Pinus mugo/Mugo Pine (Shrubs)—water use:Low

Prunus species/Bush Cherry (Shrubs)—water use:Low

Pyracantha coccinea/Firethorn or Pyracantha (Shrubs)—water use:Low

Rhus species/Sumac (Shrubs)—water use:Low

Ribes aureum/Golden Currant (Shrubs)—water use:Low

Shepherdia argentea/Silver Buffaloberry (Shrubs)—water use:Low

Symphoricarpos albus/Snowberry (Shrubs)—water use:Low

Syringa vulgaris/Common Lilac (Shrubs)—water use:Low

Yucca species/Yucca (Shrubs)—water use:Low

Acer circinatum/Vine Maple (Shrubs)—water use:moderate

Amorpha canescens/Leadplant (Shrubs)—water use:moderate

Buddleia species/Butterfly Bush (Shrubs)—water use:Moderate

Catalpa x Chilopsis/Chitalpa (Shrubs)—water use:moderate

Ceratoides lanata/Winterfat (Shrubs)—water use:moderate

Cercocarpus ledifolius/Mt. Mahogany (Shrubs)—water use:moderate

Chamaebatia millifolium/Fernbush (Shrubs)—water use:moderate

Chilopsis linearis/Desert or Flowering Willow (Shrubs)—water use:moderate

Cotoneaster species/Cotoneaster (Shrubs)—water use:Moderate

Cowania mexicana/Cliffrose (Shrubs)—water use:moderate

Fallugia paradoxa/Apache Plume (Shrubs)—water use:moderate

Forsythia species/Forsythia (Shrubs)—water use:Moderate

Hamamelis x intermedia/Witch Hazel (Shrubs)—water use:Moderate

Hesperaloe parviflora/Red Yucca (Shrubs)—water use:moderate

Juniperus chinensis/Sea Green Juniper (Shrubs)—water use:Moderate

Kerria japonica/Kerria (Shrubs)—water use:Moderate

Kolkwitzia amabilis/Beautybush (Shrubs)—water use:moderate

Philadelphus virginialis/Mock Orange (Shrubs)—water use:Moderate

Picea glauca var. albertiana 'Conica'/Dwarf Alberta Spruce (Shrubs)—water use:Moderate

Pinus contorta 'Latifolia'/Lodgepole Pine (Shrubs)—water use:moderate

Potentilla fruticosa/Shrubby Potentilla (Shrubs)—water use:Moderate

Purshia tridentata/Bitterbrush (Shrubs)—water use:moderate

R. frangula 'Asplenifolia'/Fernleafed buckthorn (Shrubs)—water use: Moderate

R. frangula 'Columnaris'/Tall Hedge Buckthorn (Shrubs)—water use: Moderate

Rhamnus frangula/Sea buckthorn (Shrubs)—water use: Moderate

Rosa species/Hardy Shrub Roses (Shrubs)—water use: Moderate

Spiraea species/Spiraea (Shrubs)—water use: Moderate

Symphoricarpa x chenaultii/Coralberry 'Hancock' (Shrubs)—water use: Moderate

Thuja occidentalis/American Arborvitae (Shrubs)—water use: Moderate

Viburnum species/Viburnum (Shrubs)—water use: Moderate

## TREES

Acer ginnala/Amur Maple (Trees)—water use: Deep Water 10-14 days

Ailanthus altissima/Tree of Heaven (Trees)—water use: Deep Water 10-14 days

Calocedrus decurrens/Incense Cedar (Trees)—water use: Deep Water 10-14 days

Catalpa species/Catalpa (Trees)—water use: Deep Water 10-14 days

Cedrus atlantica glauca/Blue Atlas Cedar (Trees)—water use: Deep Water 10-14 days

Celtis occidentalis/Hackberry (Trees)—water use: Deep Water 10-14 days

Crataegus species/Hawthorn (Trees)—water use: Deep Water 10-14 days

Elaeagnus angustifolia/Russian Olive (Trees)—water use: Deep Water 10-14 days

Gleditsia triacanthos inermis/Honeylocust (Trees)—water use: Deep Water 10-14 days

Juniperus species/Tree Juniper (Trees)—water use: Deep Water 10-14 days

Maackia amurensis/Maackia (Trees)—water use: Deep Water 10-14 days

Maclura pomifera/Osage Orange (Trees)—water use: Deep Water 10-14 days

Malus hybrids/Crabapple (Trees)—water use: Deep Water 10-14 days

Pinus species/Pine (Trees)—water use: Deep Water 10-14 days

Platanus acerifolia/Sycamore (Trees)—water use: Deep Water 10-14 days

Quercus species/Oak (Trees)—water use: Deep Water 10-14 days

Robinia species/Locust (Trees)—water use: Deep Water 10-14 days

Sequoiadendron giganteum/Giant Redwood (Trees)—water use: Deep Water 10-14 days

Ulmus parvifolia/Chinese elm (Trees)—water use: Deep Water 10-14 days

Zelkova serrata/Zelkova (Trees)—water use: Deep Water 10-14 days

Aesculus hippocastanum/Common Horsechestnut (Trees)—water use: Deep Water 7-10 days

Carpinus betulus/Hornbeam (Trees)—water use: Deep Water 7-10 days

Cotinus coggygria/Smoke Tree (Trees)—water use:Deep Water 7-10 days

Cupressus glabra/Arizona Cypress (Trees)—water use:Deep Water 7-10 days

Fraxinus species/Ash (Trees)—water use:Deep Water 7-10 days

Ginkgo biloba/Maidenhair Tree (Trees)—water use:Deep Water 7-10 days

Koelreuteria paniculata/Golden Rain Tree (Trees)—water use:Deep Water 7-10 days

Laburnum watereri/Golden Chain Tree (Trees)—water use:Deep Water 7-10 days

Liquidambar styraciflua/Sweetgum (Trees)—water use:Deep Water 7-10 days

Liriodendron tulipifera/Tulip Tree (Trees)—water use:Deep Water 7-10 days

Malus domestica/Fruiting Apple Tree (Trees)—water use:Deep Water 7-10 days

Morus alba/Mulberry (Trees)—water use:Deep Water 7-10 days

Phellodendron amurense/Amur Cork Tree (Trees)—water use:Deep Water 7-10 days

Picea species/Spruce (Trees)—water use:Deep Water 7-10 days

Pistacia chinensis/Chinese Pistache (Trees)—water use:Deep Water 7-10 days

Prunus species/Plum or Cherry (Trees)—water use:Deep Water 7-10 days

Pyrus Species/Pear (Trees)—water use:Deep Water 7-10 days

Sophora japonica/Japanese Pagoda Tree (Trees)—water use:Deep Water 7-10 days

Sorbus species/Mountain Ash (Trees)—water use:Deep Water 7-10 days

Thuja occidentalis/Arborvitae (Trees)—water use:Deep Water 7-10 days

Tilia species/Linden (Trees)—water use:Deep Water 7-10 days

Gymnocladus dioica/Kentucky Coffee Tree (Trees)—water use:Moderate

Juniperus monosperma/Singleseed Juniper (Trees)—water use:moderate

Pinus edulis/Pinon Pine (Trees)—water use:moderate

### Locate Your Meter

Most water meters will be located outside in front of your house next to the curb on the street under a steel or concrete lid.

### Reading Your Meter

There are two basic types of meters; a dial with a needle that measures in tenths of a cubic foot and a digital meter that measures from 100,000 down to 1 cubic foot. Most meters also have a small triangle on the face called a flow indicator. It will move when there is water passing through it. Read your meter from left to right.

### Measuring Water Use Activities

It is possible to measure the water use of certain activities. These activities include but are not limited to the following:

- Shower or bath use.
- Watering the lawn.
- Washing clothes or dishes.
- Flushing a toilet
- Washing a car

To measure the water use of an activity, do the following (in order):

1. Make sure all water off. This includes all faucets (inside and out), appliances, swamp coolers, or icemakers.
2. Write down the meter reading to two decimal places.
3. Perform the activity. Be sure to measure the amount of time in minutes that the activity required.
4. At the end of the activity read the meter again. Subtract the first meter reading from the second one. The result is the amount of water used for the activity in cubic feet. To convert to gallons multiply the result by 7.48. To determine how many gallons per minute were used divide the gallon amount by the number of minutes the activity required. You should now have the water used amount in *gallons per minute*.

### Detecting Leaks

1. Make sure all water off. This includes all faucets (inside and out), appliances, swamp coolers, or icemakers.
2. Write down the meter reading and time of day to the minute.
3. Wait at least an hour before reading the meter a second time. Make sure no water is used during the test. Read the meter at the end of the test and record the time to the minute. If the flow indicator is moving during the test you either have a leak or a meter malfunction.

4. Subtract the first meter reading from the second. Multiply the remainder by 7.48. The result is the amount of water in gallons that passed through the meter during the test period. Also record the time duration of the test.
5. Divide the amount of water by the number of minutes in the test. The result is the amount of water that went through the meter in *gallons per minute*.
6. To measure amount lost over time multiply the gallons per minute by the following:
  - 1,440 for gallons per day.
  - 43,920 for gallons per month.
  - 527,040 for gallons per year.
7. Locating a leak is a process of elimination. Shut off one toilet at a time at the wall. Go to the meter and check to see if the flow indicator (triangle) is still moving. If the triangle has stopped you have discovered the leak. If not go on to the next one and repeat the above steps.
8. Check your sprinkler system. Shut off the system at the anti siphon valve and check the meter.
9. Check your main service line. You will need to shut off the valve between your house and the meter. If the meter stops the leak is between the meter and the valve.
10. These steps can be repeated for every fixture and fitting in your home. In the event you cannot locate the leak, you should call a professional plumber to find and fix it.

# DOUGLAS COUNTY UTILITIES WATER WASTE REPORT FORM

Please use this form to report water waste. Our investigators must witness the waste in progress to issue a violation form. Please provide as much information as possible of help us identify the problem.

**TIME OBSERVED:**

**DATE OBSERVED (M/D/Y):**

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**ADDRESS OR LOCATION OF WASTE:**

<b>STREET ADDRESS:</b>	<b>CITY:</b>
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**MAJOR CROSS STREETS:**

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- |   |   |
|---|---|
| <input type="checkbox"/> OVER-WATERING          | <input type="checkbox"/> FOUNTAIN / WATER FEATURE VIOLATION |
| <input type="checkbox"/> BROKEN SPRINKLER       | <input type="checkbox"/> BROKEN PIPE OR ONSITE LEAK         |
| <input type="checkbox"/> TIME-OF-DAY VIOLATION  | <input type="checkbox"/> MISTING SYSTEM VIOLATION           |
| <input type="checkbox"/> ASSIGNED DAY VIOLATION | <input type="checkbox"/> OTHER                              |

**DESCRIPTION:**

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**APPENDIX H – EPA Residential Benchmarks**

<b>Type of Use</b>	<b>Likely Range of Values</b>
<b>INDOOR USES</b>	
Average household size	2.0 – 3.0 persons
Frequency of toilet flushing	4.0 – 6.0 flushes per person per day
Flushing volumes	1.6 – 8.0 gallons per flush
Fraction of leaking toilets	0 – 30 percent
Showering frequency	0 – 1.0 showers per person per day
Duration of average shower	5 – 15 minutes
Shower flow rates	1.5 – 5.0 gallons per minute
Bathing frequency	0 – 0.2 baths per person per day
Volume of water	30 – 50 gallons per cycle
Washing machine use	0.2 – 0.5 loads per person per day
Volume of water	45 – 50 Gallons per cycle
Dishwasher use	0.1 – 0.3 Loads per person per day
Volume of water	10 – 15 gallons per cycle
Kitchen faucet use	0.5 – 5.0 Minutes per person per day
Faucet flow rates	2.0 – 3.0 gallons per minute
<b>OUTDOOR USES</b>	
Average lot size	5000 – 8000 square feet
Average house size	1200 – 2500 square feet
Landscape area	4000 – 5000 square feet
Fraction of lot size in turf	30 – 50 percent
Water application rates	1 – 5 feet per year
Homes with pools	10 – 25 percent
Pools evaporation losses	3 – 7 feet per year
Frequency of refilling pool	1 – 2 times per year

Chapter 20.694 *Table of Contents*

## LANDSCAPE STANDARDS

**Sections:**

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20.694.030 Exemptions.

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20.694.060 Landscape plans, required.

20.694.070 Landscape plans, submittal requirements.

20.694.080 Irrigation plans, submittal requirements.

20.694.090 Landscape materials.

20.694.100 Landscape design standards.

20.694.110 Screening

20.694.120 Site distance for landscaping adjacent to public rights-of-way and points of access.

20.694.130 Final inspection.

**20.694.010 Purpose.**

The purpose of this chapter is to establish minimum standards for the placement, amount, and type of landscape materials to be installed in order to enhance the aesthetics of the community, including the visual appearance of streets, to reduce noise, dust, and erosion, conserve water resources, provide groundwater recharge, preserve open space and wetlands, provide privacy from visual and physical intrusion, and to insulate from the effects of weather conditions. (Ord. 763, 1996) [Back](#)

**20.694.020 Applicability.**

A. Landscaping requirements shall apply to construction of the following projects unless specifically listed as an exemption or otherwise noted in this chapter:

1. Single-family subdivisions creating parcels of one-half acre or less (for street trees only).
2. Duplex or multi-family residential;
3. Industrial;
4. Commercial;
5. Institutional uses; and
6. Public uses. (Ord. 763, 1996) [Back](#)

**20.694.030 Exemptions.**

A. The following types of development are exempt from the landscape requirements in this chapter:

1. Development of a single-family detached dwelling not a part of a subdivision tentatively approved after adoption of this title, and accessory structures;
2. Previously approved development which conforms to all conditions of approval;
3. Additions to existing structures or accessory structures that are under ten percent of the total gross floor area or 5,000 square feet, whichever is less. (Ord. 763, 1996) [Back](#)

**20.694.040 General.**

A. All landscape materials shall be natural or living materials. Plastic, simulated or synthetic materials are not permitted except for the use as weed block and as irrigation materials.

B. All landscape areas must be irrigated with an underground irrigation system, adequate to service

the landscape areas.

C. Final landscape and irrigation plans must be submitted at the time of building permit application.

D. Landscape materials shall follow the approved tree, shrub, and groundcover species list contained within the county design criteria and improvement standards manual to the extent possible. Exceptions to the list are at the sole discretion of the director.

E. Installation of landscaping and irrigation systems must follow the approved plans. Any plant substitutes can only be authorized by the person who develops the plan, with the director's approval. Approval must be obtained prior to plant installation. (Ord.763, 1996) [Back](#)

#### **20.694.050 Maintenance.**

The owner, or his agent, is responsible for the maintenance of all landscaping and irrigation systems, which shall be maintained in good condition, to present a healthy, neat, and orderly appearance and must be kept free from weeds, refuse, and debris. Maintenance includes the immediate replacement of all dead and diseased plant material. (Ord. 763, 1996) [Back](#)

#### **20.694.060 Landscape plans, required.**

A. A landscape plan must be filed with the department for the following:

1. Applications for a building permit or improvement plans which requires design review approval;
2. Any tentative map which includes common, improved open space areas, or required street trees.

B. The plan shall, at a minimum, identify all areas to be landscaped and include area and tree calculations and general types of landscaping proposed for the area.

C. A landscape plan must be approved by the director, prior to the issuance of a building permit or the approval of a final map including common area. The landscape plan must be approved for remodel permits for a change of use from residential to non-residential or from single-family to multi-family.

D. The landscape plan must be prepared by one of the following:

1. A licensed landscape architect;
2. A licensed landscape contractor;
3. A licensed architect; or
4. A registered civil engineer. (Ord. 801, 1997, Ord. 763, 1996) [Back](#)

#### **20.694.070 Landscape plans, submittal requirements.**

A. Landscape and irrigation plans must be in the format as prescribed in this section and contain the following for the development and installation of all landscape areas.

B. The final landscape plan shall include the following:

1. Scale (one inch equals 20 feet (1"=20') or one inch equals 30 feet(1"=30')), north arrow, location of adjacent streets, property lines, easements, sidewalks, drives, paved areas, lighting, signs, buildings, all utilities and mechanical equipment within the landscape areas, existing trees and other natural or man-made site features influencing the use of the site, and surrounding types of landscaping;
2. Construction details for installation of the landscape in accordance with county standards, including topographical features and grading plans, soil type, method of soil preparation, fertilization added at time of planting, area to be excavated before planting and manner of root exposure, tree staking and guying;
3. A note or calculation sheet with all landscape calculations relevant to the application of this chapter, including site area, areas of required number of parking spaces, number of trees and shrubs, type and amount of living and non-living ground cover, type and amount, if any, of decorative paving material, and percentage of each to be used on the property;
4. A plant list utilizing a wide variety of native and drought tolerant trees, shrubs and plants, based upon the recommended list of species provided in this chapter. The plant list shall include the

common and botanical names of plants to be used. This plant list must be arranged in legend form with a key number assigned to each plant. On the plan, each plant shall be identified by a key number. The size of the plant, its spacing and the quantity to be used shall follow in the legend, as the following example illustrates: (Ord. 763, 1996) [Back](#)

#### Typical Plan List

No.	Botanical Name	Common Name	Size	Space	Quantity
1.	Acer ginnala	Amur Maple	2-inch caliper	30 feet o.c.*	10
2.	Pyrus calleryana	Flowering Pear	2-inch caliper	20 feet o.c.	12
3.	Forsythia	Early Forsythia	1 gallon	3 feet o.c.	25
4.	Syringa	Late Lilac	5 gallons	5 feet o.c.	7
5.	Vinca Minor	Dwarf Periwinkle	flat	12 inches o.c.	68

\* o.c. = "on center"

Ord. 763, 1996) [Back](#)

#### 20.694.080 Irrigation plans, submittal requirements.

A. Irrigation plans, and specifications which comply with the Uniform Plumbing Code, must be submitted with the landscape plan to insure adequate irrigation coverage. To increase water conservation, the system must be automatic drip, bubbler, or sprinkler irrigation. Sprinkler irrigation is only allowed on lawn areas, except that some groundcovers may use sprinkler irrigation with the approval by the director. All drip and bubbler irrigation systems must be installed separately from turf irrigation systems. All irrigation plans must include the following:

1. Scale at the same scale as the landscape plan, north arrow, location of adjacent streets, property lines, easements, sidewalks, drives, paved areas, lighting, signs, buildings, all utilities and mechanical equipment within the landscape areas, existing trees and other natural or man-made site features influencing the use of the site;

2. Identification and description of automatic irrigation components to insure that vegetation is adequately irrigated. All irrigation plans shall incorporate water conserving principles, including multiple program controllers with percent scaling, low precipitation heads, drip irrigation, and check valves. Where applicable, irrigation details must include the method for the watering of required street trees. All valves and other devices are to be housed in a box of adequate size and design to protect the components.

3. Indication of the system point of connection and size, water pressure available, and maximum demand of the system in gallons per minute (gpm);

4. Irrigation equipment specified must be identified by manufacturer's name and equipment identification number;

5. Cross connection devices installed for all construction shall have a reduced pressure backflow preventer (R.P. device), except for single-family development;

6. All locations of irrigation valves, controllers, hose bibs, quick coupler valves, and backflow preventers. Sprinkler location on plans must include typical pattern of sprays (i.e., full circle, half circle), psi, radius of throw and gallons per minute;

7. Irrigation details must be used to clarify particular situations. Typical details must include backflow prevention devices, valves, irrigation heads, and irrigation controllers;

8. Sizes of irrigation lines. Schedule 40 P.V.C. is required for all pressure lines and under all paved areas. Piping must be installed a minimum of 12 inches underground for non pressure irrigation lines and 18 inches underground for constant pressure irrigation lines. (Ord. 763, 1996) [Back](#)

#### 20.694.090 Landscape materials.

A. Landscape materials are limited to the following:

1. Living materials, including turf, ground covers, plants and shrubs, vines, hedges, and trees;
2. Non-living materials, including rocks, gravel, tile, bricks, wood, bark, and related materials, may be used as ground cover within the required landscape areas with the approval of the community development department. No more than 20 percent of the landscape material shall include rock or gravel, and at least 50 percent of the area devoted to groundcover and planter areas shall be living materials. A variety of living and non-living ground cover materials is required for all projects;
3. Existing trees and shrubs shall be preserved wherever possible and may be considered part of the required landscape material;
4. Existing trees with a trunk diameter of eight inches or more at a point 12 inches above ground level shall be preserved, unless its removal is authorized on the approved site plan or map;
5. Turf is not allowed in any space measuring less than four feet in width or length. Turf is not allowed in areas with a slope greater than 20 percent (1:5), only drought-tolerant native grasses, which decrease soil erosion and require less water consumption, are allowed on slopes in excess of 20 percent;
6. Plant material and ground cover must be distributed evenly throughout the parking lot or site area.
7. Xeriscape designs using drought tolerant, native plant species are encouraged. (Ord. 763, 1996) [Back](#)

**20.694.100 Landscape design standards.**

- A. At least 15 percent of the total paved area devoted to parking and driveway areas must be offset by pervious areas of landscape material (new or existing trees and shrubs). All landscaping must be irrigated with an irrigation system approved by the department.
- B. Plant materials existing or proposed within public rights-of-way adjacent to a landscaping project shall be included on the landscape plan but will not be counted toward the total required landscape area.
- C. Where a perimeter fence or wall is proposed along a street frontage within a residential subdivision, a minimum five-foot landscape planter area shall be provided outside the fenced area adjacent to the sidewalk. This area shall include street trees and a variety of shrubs and plants to screen the fence and provide an aesthetically pleasing streetscape.
- D. On multi-family developments, 50 percent of the required common open space areas shall be planted in turf.
- E. New construction shall provide adequate shade trees in all paved areas and provide an appropriate balance of evergreen and deciduous plantings throughout the site.
- F. The landscape plans shall show a minimum of one tree for every 400 square feet of required on-site landscaped area.
- G. In addition to paragraph F above, street trees, with a minimum two-inch caliper and five-foot spread, are required for all new commercial, industrial, public, institutional, or residential subdivisions creating parcels of one-half net acre or less. One tree shall be planted, at a maximum, for each 40 lineal feet of street frontage, on average. Street trees must be planted by the developer and include proper irrigation prior to the issuance of a certificate of occupancy. In single-family residential subdivisions, installation of trees and irrigation system shall occur prior to issuance of a certificate of occupancy for each individual dwelling unit. Street trees must be setback a minimum of ten feet from water and sewer lines, 30 feet from an intersection, and ten feet from any driveway, hydrant, or street sign. Trees which grow to more than 20 feet in height may not be planted under overhead utility lines. Street trees within highway rights-of-way shall limit mature spread to 20 feet. Street trees shall follow the approved street tree list. Any exceptions to the list shall be at the discretion of the director.
- H. All trees must be staked in accordance with the International Society of Arborists standards.
- I. Street trees adjacent to sidewalks, parking lots, or streets must be free of fruit or other elements which litter the ground. All street trees must be heat and cold resistant, tolerant of the urban environment, and insect and disease resistant.
- J. Shrubs and hedges must be a minimum five-gallon size. Hedges, where required, shall be planted

and maintained to form a continuous, unbroken, solid, visual screen within three years after planting. Vines shall be a minimum of two feet in height at the time of planting and may be used only in conjunction with fences, screens, or walls to meet physical barrier requirements.

K. Wherever rock or bark are used as ground cover, the installation must prevent vegetation growth through the ground cover either through the use of herbicides or landscape fabric material. Fabric material must be properly pinned to the soil to avoid lifting.

L. All required street trees, parking lot trees, and trees required for screening purposes must be a minimum two-inch caliper and five-foot spread. All other landscaped trees may be one and one-half inch caliper for deciduous trees, and six-foot minimum height for evergreen trees. (Ord. 801, 1977; Ord. 763, 1996) [Back](#)

#### **20.694.110 Screening.**

Plant materials shall be used to screen irrigation equipment boxes, storage, refuse, public utilities, and other features which do not enhance the overall appearance of the site. Landscape screening shall achieve the desired effect within three years. (Ord. 763, 1996) [Back](#)

#### **20.694.120 Site distance for landscaping adjacent to public rights-of-way and points of access.**

When an accessway or driveway intersects a public right-of-way or when the subject property abuts the intersection of two or more public rights-of-way, all landscaping within the traffic safety site area must provide unobstructed cross-visibility at a level between three feet and eight feet in height. Trees having limbs and foliage trimmed in a manner that no limbs or foliage extend into the cross-visibility area are allowed, provided their location does not create a traffic hazard. (Ord. 763, 1996) [Back](#)

#### **20.694.130 Final inspection.**

All landscaping must be properly installed and be according to approved plans prior to final inspection and certificate of occupancy by the department. An exception is allowed only when the landscaping cannot be completed due to weather related delays. In lieu of the installation of landscaping, financial security per chapter [20.720](#), shall be provided at 150 percent of the estimated cost of installation. The owner must guarantee installation as specified in the temporary certificate of occupancy agreement, and final inspection must be completed within six months of the issuance of a temporary certificate. The estimated cost of the landscaping is subject to verification by the department. (Ord. 763, 1996) [Back](#)

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## TITLE 20

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## APPENDIX F

**Water Facilities****Sections:**

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- 20.F.100 Service connection.
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- 20.F.120 Termination and restoration of service.

**20.F.010 General provisions.**

- A. This appendix is known and may be cited as the Douglas County water service ordinance.
- B. This ordinance is adopted pursuant to NRS 244.157.
- C. The county may furnish systems used for the supply, treatment, and distribution of water in the service area designated by the board of county commissioners, including all parts of the enterprise, all appurtenances, land, easements, rights in land, contract rights and franchises.
- D. Any person with standing, aggrieved by a final determination on any provision of this appendix by the director or his designee may appeal the final determination to the appellate body, and in the manner provided by chapter 20.28.
- E. The director retains the right to grant adjustments and exceptions to the provisions of this ordinance in order to vary or modify the strict application in cases where there are practical difficulties or unnecessary hardships.  
The board may find by reason of special circumstances that the application of any provision of this appendix should be suspended or modified as applied to a particular premise and may, by resolution, order the suspension or modification for any premises during the period of the special circumstances.
- F. This ordinance shall be reviewed by the board not less than every two years to insure that the provisions of this ordinance are kept up to date and sufficient to operate the water facilities.
- G. Any violation of the provisions of this ordinance is an infraction and may result in discontinuance of the customer's service. Termination of water service shall be in accordance with section 20.F.120 of this ordinance. (Ord. 883, 1999) [Back](#)

**20.F.020 Definitions.**

- A. Words defined:
  1. **Applicant** means the person making application for service who is the owner of the premises, or its authorized agent.
  2. **Application** means a written request for water service on a form provided by the county as distinguished from an inquiry as to the availability of or charges for service.
  3. **Average month** consists of 30 days.
  4. **Billing period** means the period for which a billing is made. It may be for an average month and need not coincide with the calendar month (i.e., may be billed on a cycle of 29 to 31 days.)

5. **Building** means any structure used for human habitation or a place of business, recreation or other purposes containing potable water facilities.

6. **Contractor** means an individual, firm, corporation, partnership or association duly licensed by the state of Nevada to perform the type of work to be done under a permit.

7. **County** means Douglas County.

8. **Customer** means the person in whose name service is rendered and who signed the application or contract for that service, or in the absence of a signed instrument, by the receipt and payment of bills regularly issued in his name regardless of the identity of the actual user of the service.

9. **Date of presentation** means the date upon which a bill or notice is mailed, postmarked or delivered to the customer.

10. **Developer** means the person or persons who have made an application to Douglas County to perform development.

11. **Development** means a parcel of property being improved and requiring installation of water mains to and possibly on the property being improved.

12. **Director** means the Douglas county community development director or his designee.

13. **Gallon** means the volume of water that occupies 231 cubic inches.

14. **Law** means any statute, rule or regulation established and enforced by federal, state, county or municipal authorities.

15. **Living unit** means any residence, apartment, or other structure to be occupied for habitation purposes by a single person or family requiring water service.

16. **Main classification:**

a. **Off-site main** means a water main, regardless of size, that extends from an existing water system to a development, but excluding on-site mains.

b. **On-site main** means those public mains that are installed specifically to provide service to developments, and generally located within the development's boundaries.

c. **Public main** means those mains that are owned, operated and maintained by the county after completion and acceptance.

d. **Private main** means all water mains not owned, or operated and maintained by the county after completion.

17. **Metered service** means a service for which charges are computed on the basis of measured quantities of water by a meter.

18. **Owner** means a fee owner of the premises.

19. **Permanent service** means a service which, in the opinion of the director, is of a permanent and established character. The use of the water may be continuous, intermittent or seasonal in nature.

20. **Permit** means any written authorization required pursuant to this or any other regulation for the installation or operation of any water works.

21. **Person** means any individual, firm, co-partnership, joint venture, association, social club, fraternal organization, company, joint stock association, corporation, estate, trust, organization, business, business trust, public agency, school district, State of Nevada, and its political subdivisions or instrumentalities, receiver, syndicate or any group of combination thereof, acting as a unit, including any trustee, receiver or assignee.

22. **Premises** means all of the real property and services to a single integrated activity operating under one name to one or more buildings, locations, or services, provided that (a) such a building, location or services are to a single unit of property; or (b) such two or more units or property immediately adjoining, except for intervening public highways, streets, alleys or waterways.

23. **Private fire service** means a service through a line, to hydrants or sprinkler system used to extinguish accidental fires, not located within a public dedicated and accepted right-of-way.

24. **Service and connection classification:**

a. **Combined service** means a service connection that provides water for the dual purposes of fire protection and domestic use.

b. **Commercial service** means a service connection to include, but not limited to, office

buildings, private clubs, motels, hotels, department stores, restaurants, casinos and schools.

c. **Domestic service** means a service connection obtained for purposes exclusive of fire protection, but including residential, commercial, and industrial uses.

d. **Emergency service** means a temporary service connection for the purpose of providing water to safeguard health and protect private or public property, subject to the conditions governing temporary service connections.

e. **Industrial service** means a service to customers engaged in a process that creates or changes raw or unfinished materials into another form or product including, but not limited to, factories, mills, machine shops, mines, pumping plants, canning and packing plants, and processing activities.

f. **Interim service** means a non-permanent service connection for use during the construction of subdivisions, or other construction projects.

g. **Non-standard connection** means service connection installed at a location not adjacent to the property served and where there will never be a main installed contiguous to the property.

h. **Private fire service** means a service connection through which water is delivered to private property for fire protection exclusively.

i. **Residential service** means the piping, meter, meter pit, and associated appurtenances from the main to a customer in a single family dwelling, mobile home or building, or in an individual flat, condominium, or apartment in a multiple family dwelling, or building or any portion occupied as the home, residence or sleeping place of one or more persons.

j. **Service connection** means the lateral pipe from the point of connection to a county water main including the curb stop valve or meter box to the customer's property line.

k. **Standard service connection or Permanent service connection** means a service connection installed at a location adjacent to the property being served.

l. **Temporary service connection** means a service connection installed at a location, not adjacent to the property served, that is subject to removal or relocation at the time a main is constructed.

25. **Tenant** means a person renting or leasing a premises from the owner or the owner's representative. (Ord. 883, 1999) [Back](#)

#### 20.F.030 Conditions of service.

A. All applicants for service connections or water service are required to accept the conditions of pressure or service provided by the distribution system at the location of the proposed service connection, and to hold the county harmless for any damages arising out of low or high pressure conditions or interruptions in service. Minimum operating pressure will equal or exceed 40 psi at the outlet of the meter pit.

B. Properties within the boundaries of a county water service area are eligible for water service from the county in accordance with the provisions of this appendix. Properties outside the boundaries of the county's water service areas must be annexed into a county service area to be eligible to receive water from the county.

C. New applications for water service will be accepted only if the water main is extended to the property being served, and the main must be within a dedicated right-of-way or easement granted to the county.

D. To obtain service to property not immediately adjacent to a water main the applicant may provide a main extension in accordance with the provisions of this appendix, or the applicant may make application for a non-standard service if the property meets the specified requirements.

E. The county is not liable for damage to property resulting from water running from open or faulty piping or fixtures on the customer's property or from interruption or termination of service in accordance with the provisions of this ordinance. Customers who request activation of a service shall be responsible for damage resulting from the activation due to open or faulty piping and fixtures on the customer's property.

F. No one except an employee or designated representative of the county may operate the curb stops or valves, main stops, gates or valves of the county's system. No one shall interfere with the

meters or their connections, street mains, or other parts of the system.

G. The customer must, at their own expense, furnish, install, and maintain all equipment necessary for receiving, controlling, applying and utilizing water on their premises. The county is not responsible for any loss or damage caused by the improper installation of equipment, or the negligent or wrongful act of the customer or their tenants, agents, employees, contractors in installing, operating, or maintaining their equipment.

H. County employees shall have the right to access customer's property at all reasonable hours for any purpose related to the furnishings of service and protection of water quality. County employees are prohibited from entering upon customer's premises to repair or alter a customer's piping and fixtures.

I. No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, or is allowed to flow onto adjacent properties, roads, or drainage ditches, the county may terminate water service if the conditions are not corrected within 5 days after giving the customer written notice.

J. The county has the right to restrict, and apportion, its available water supply during any emergency caused by drought, or other threatened or existing water supply shortage, and to prohibit the waste of water or the use of water during any period for any purpose other than household uses, or other uses as may be determined to be necessary. The county may prohibit use of water during these periods for specific uses that they county may from time to time find to be nonessential. (Ord. 883, 1999)

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#### **20.F.040 Notices.**

A. Notice to a customer will normally be in writing and will be delivered or mailed to the customer's last known address.

B. The director will endeavor to notify customers in advance of any scheduled interruption in service due to repairs, or other causes. In emergencies, or when circumstances warrant, service may be interrupted for indefinite periods of time, the director will endeavor to notify customers as soon as practical.

C. A customer shall make notification in writing to the to the director at its administrative office at the Community Development Department, Post Office Box 218, Minden, Nevada 89423. All billing inquiries and account information should be addressed to the Treasurer's Office, Post Office Box 218, Minden, Nevada 89423.

D. In emergencies, or when conditions warrant, the customer may notify the county in person or by telephone. This notification will be followed by a letter. (Ord. 883, 1999)

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#### **20.F.050 Application for water services.**

A. Water service will be furnished to applicants whose premises are wholly situated within the boundaries of the service areas adopted by the board. Premises outside of the service area boundaries can be served on the basis of a contract to be negotiated between the applicant and the county, or inclusion in the service area.

B. For new service each applicant will be required to apply for a water connection permit on a form provided by the county. The application must be accompanied by payment of all applicable fees as adopted by the board. Water connection permits will be issued by the director, or his designee, upon payment of the required fees. The property owner will certify that no property other than their own or public property will be crossed, or an easement in a form suitable to the county must accompany the application. The application must include information concerning the type of service; the purpose and the type of facilities to be served on a form prescribed by the director.

C. If an applicant provides incorrect information as to the size and location of a service connection or requests a change in the size or location after work has commenced, the applicant must pay all costs incurred by reason of any corrections and changes.

- D. Applications for service through existing connections or new connections may be rejected if:
1. The account of the applicant at the same or any other location is delinquent.
  2. The purpose of the applicant, in the opinion of the director, is to circumvent discontinuance of service in another name because of non-payment of water bills.
  3. If the applicant is not within the boundaries of the county water service area.
  4. If the intended use will be detrimental or injurious to existing customers.
  5. If the applicant fails to comply with any of the provisions of this appendix.
  6. If, in the judgment of the director, the applicant's installation for using the service is unsafe, hazardous or subject to freezing, flooding, or is of a nature that satisfactory service cannot be rendered.
  7. Where service has been disconnected for fraudulent use, the county water system will not serve an applicant until the director has determined that all conditions of fraudulent use or practice have been corrected.

E. When an applicant is refused service, the director or his designee will notify the applicant, by procedures outlined in section 20.F.400, Notices, of the reason for refusal of service and the right of the applicant to appeal the decision to the board. (Ord. 883, 1999) [Back](#)

### **20.F.060 Rates and charges.**

A. All rates, fees and charges are set by resolutions adopted by the board.

B. Charges and fees for connection to the potable water system consist of a connection fee, installation fee, inspection fee, and in lieu of water rights fee when required.

1. Connection fee: To equalize investments in facilities made by new service and present water users, a connection fee will be collected for all new services in the amounts established by resolution. The connection fee does not include the service connection (tap and service lateral to the property).

2. Installation fee: In addition to the connection fee, an installation fee will be collected to cover the cost of materials, equipment, and labor for installing a service connection (tap and service lateral to the property). The installation fee will be collected in the amounts established by resolution. The director reserves the right to require the applicant to install the service connection, in lieu of collecting the installation fee.

3. Inspection fee: When the applicant is required by the director to install the service connection, the applicant will pay an inspection fee for the inspection and approval of the installation. The inspection fee will be collected in the amounts established by resolution.

4. Cash in lieu of water rights: The county reserves the right to collect a fee in lieu of dedication of water rights in accordance with, subsection 20.100.040. The fee in lieu of dedication of water rights will be collected in the amounts established by resolution.

C. Connection fees are required for all new connections. The fee shall be charged for each connection, including but not limited to, each dwelling unit or lot, irrigation connection, and common area or facility on the final subdivision or parcel map. The fee shall be paid to the county prior to approval of the final subdivision map or parcel map, issuance of building permit, or initiation of work by the county.

The connection fee for service to residential units shall be charged for each residential unit being served. Each apartment of an apartment building, each condo of a condominium development, each mobile home, whether on individual lots or parks, shall be charged a residential connection fee. The connection fee shall apply whether each unit is individually served or a group of residential units are served through one connection.

The connection fee for service to commercial and industrial units shall be charged for each unit under separate ownership being served. The connection fee shall apply whether each unit is individually served or a group of units are served through one connection. (Ord. 883, 1999) [Back](#)

### **20.F.070 Basis of billing.**

A. All metered services shall be billed on the basis of service line size in accordance with the water usage charge and monthly base rates established by resolution.

B. All unmetered services shall be billed on the basis of service line size in accordance with the monthly rates established by resolution.

C. Customers are responsible for payment of all water recorded as having passed through a meter regardless of whether the water was put to the beneficial use.

D. The owner of the property will be ultimately responsible for payment of water bills and fees in case of non-payment by a tenant.

E. In the event a single meter is used to serve more than one dwelling or commercial unit under separate ownership, a monthly base charge will be collected for each dwelling or unit served plus the usage charge. Two or more houses under one ownership and on the same lot or parcel may be supplied through the same service connection; provided that for each house under separate roof an additional base fee be applied to the monthly billing. (Ord. 883, 1999) [Back](#)

#### **20.F.080 Time and manner of payment.**

A. The utility division will read the water meters in the service area monthly and, as soon thereafter as practical, the treasurer will issue a bill for each service in accordance with the provisions of this appendix. For unmetered customers, bills may be issued in advance of or after a billing period.

B. Account not paid by the first of the following month are delinquent and will be charged a late payment penalty as established by resolution on the outstanding balance.

C. The county may discontinue service to a customer having a delinquent bill that is more than 90 days in arrears. Termination of water service shall be in accordance with section 20.F.110.

D. Until paid, all rates, tolls and charges constitute a perpetual lien on and against the property served and may be foreclosed upon as provided by law.

E. If any opening or closing bill is for a period shorter than the regular billing period, the base rate charge or flat rate charge for service shall be reduced in the same proportion as the actual period of use is reduced from the regular billing period.

F. Failure to receive a bill shall not relieve the customer of the obligation to pay for service received.

G. Checks presented in payment of bills that are returned by a bank will be treated as though no payment has been made, and a handling charge will be levied by the treasurer plus any additional charges of the bank.

H. For the purpose of computing charges, each meter will be considered separately, and readings of multiple meters will not be combined, except where a battery of smaller meters has been installed in lieu of a larger meter one of the county system's convenience. In such cases, charges will be computed as if the water used has been measured through a single meter.

I. If a meter cannot be read because of obstructions or other causes, the county water system may estimate the quantity of water used, and a bill shall be issued for the estimated service. The next succeeding bill that is based upon actual meter readings will reflect the difference between prior estimates and actual consumption. If a meter is found to be non-operable, the county water system may estimate the consumption and bill for that amount.

J. If a dispute between a customer and the director as to the correct amount of any bill rendered by the county water system for water service furnished to the customer, the customer must deposit with the treasurer the amount claimed by the director to be due.

K. If the customer fails to make the deposit within 15 days after written notice by the treasurer that the deposit be made or service disconnected, the county water system may discontinue service to the customer without further notice. (Ord. 883, 1999) [Back](#)

#### **20.F.090 Disputed bills.**

A. If a dispute between a customer and the director as to the correct amount of any bill rendered by the county water system for water service furnished to the customer, the customer must deposit with the treasurer the amount claimed by the director to be due.

B. If the customer fails to make the deposit within 15 days after written notice by the treasurer that the deposit be made or service discontinued, the county water system may discontinue service to the

customer without further notice.

C. In the event of dispute concerning any bill, charges or service, the treasurer will investigate the situation, as may be required, and report the findings of the investigation to the customer. (Ord. 883, 1999) [Back](#)

#### **20.F.100 Service connections.**

A. The county reserves the right to determine the size of service connection to be installed, giving consideration to the needs of the applicant and the capacity of the main to which the service is connected. No service connection will be approved of a size larger than can be supplied by the main without adversely affecting service to other customers. If an existing main is determined to be inadequate to meet the requirements of an applicant and a main extension will provide for those requirements, provisions of this ordinance applying to main extensions will be followed. Whenever two mains are available from which service can be provided, the county shall, at its discretion, determine the main to which the service connection will be made.

B. Service connections must be installed at right angles to a main and the point of connection must not be within a street intersection. The meter box or shutoff valve location must be within the public right-of-way or easement adjacent to existing or proposed curb line. In alleys or easements, meter or shutoff valve boxes shall be located at a point as close as practicable to the property line near where the main is located. All meter and shutoff valve boxes must be located outside of driveways and other areas where access by county water system personnel for operation and maintenance may be restricted.

C. All service connections must conform with the county's design criteria and improvement standards.

D. Service connections, excluding private fire services, including the lateral, meter, meter box and appurtenances up to the customer property line are will remain the property of the county. All piping and appurtenances on the customer's side of the meter or shutoff valve shall be maintained by the property owner.

E. Private fire service is restricted to standby for emergency fire protection. The director may require installation of an approved backflow prevention device. The customer shall be responsible for the maintenance and repair of the service from the main to the building.

F. Combined service for domestic and private fire service will not be allowed.

G. The director may authorize a temporary service connection when the applicant's property is not adjacent to a water main. As a condition to installation of temporary service, the applicant must make application for a main extension and pay all applicable fees. Temporary service will be allowed only when approved by the director. The temporary service connection will be disconnected and terminated within the time frame specified by the director. The applicant will be charged for water usage in accordance with the schedule of rates, fees and charges established by resolution.

H. Emergency service may be authorized for limited periods of time when the usual source of supply fails or is declared to be potentially harmful or in other circumstances that endanger health or property. Emergency service may be allowed only when approved by the director.

I. Non-standard service may be authorized when in the opinion of the director, a main extension will never be necessary for orderly development of the system, fire protection, service to other property, or other reasons. Non-standard service laterals from curb stop of meter box or shutoff valve to the customer must not be located within public thoroughfare. A copy of the recorded easement deed over private property for the service lateral shall be made available to the county water system.

J. Each residential dwelling or commercial unit under separate ownership must be provided with a separate service connection. Two or more houses under one ownership and on the same lot or parcel may be supplied through the same service connection; provided that for each house, under separate roof, an additional base fee be applied to the monthly billing, or a separate service connection may be provided for each building and each charged as a separate service. The director reserves the right to limit the number of houses or the area of land under one ownership to be supplied by a single service connection.

K. A service connection shall not be used to supply adjoining property of a different owner or to supply property of the same owner across a street or alley. When property provided with a service connection is divided, each service connection shall be considered as belonging to the lot or parcel of land that it directly enters.

L. A planned unit development may consist of attached or detached single family dwelling units, townhouses, cluster units, condominiums, garden apartments, or any combination. A separate service connection is required for each dwelling unit within the development. Separate connections are required for common areas, including irrigation, recreation and utility. These areas or buildings shall not be interconnected or served directly from services providing water to dwelling units.

M. For installation of county water system facilities by a developer, the following shall apply:

1. The developer shall pay to the treasurer prior to the approval of any installation of water facilities or subdivision map, all applicable fees and charges in accordance to the rate schedule in effect.

2. Plans and specifications for the water system improvements to be construed by the developer shall be prepared by a Nevada professional engineer retained by the developer, and shall be approved by the director and all applicable agencies before construction is started.

3. All county water system facilities must be located within easements or rights-of-way. Meter boxes or shut off valve boxes must be located outside of the public thoroughfare and must be protected from vehicular traffic, as determined by the director.

4. The county water system employee or representative must inspect and approve the installation of the water facilities before service is provided.

N. Service connections, other than in subdivisions, must be installed by the county water system. The director reserves the right to permit installation of the service connection by independent licensed contractors. In such event, county design specifications must be adhered to and tapping of a main will be permitted only in the presence of a county water system representative.

O. The director reserves the right to prohibit connections to certain mains when, in his opinion, the connections may impair the integrity of the mains or the location would not be conducive to the orderly development and planning of the water system.

P. Enlargement of a service connection to the same property, requiring abandonment of the existing connection and installation of a complete replacement connection of increased size will be treated as a new connection and will be charged accordingly. The fees to be paid by the property owner upon application for increase in size of service connection shall be the installation fee for the size of the larger service being installed and a connection privilege fee which shall be determined by subtracting the connection fee for the size of the service being abandoned from the connection fee for the size of service being installed.

Q. An existing service connection may be relocated, if the new service is of like size and will provide a water supply to the same parcel or property, upon application and payment of an installation fee by the property owner. (Ord. 883, 1999) [Back](#)

#### **20.F.110 Main extensions.**

A. If the director requires the owner to extend the water main, then the owner must extend the water main the entire frontage of his parcel unless the director finds it to be physically improper to do so.

B. The applicant is responsible for the construction of the water main along any of the property sides or frontages of the property that a water main is needed for the overall completeness and continuity of the county's water system. The applicant is responsible for the necessary and required water system within the interior tract of land.

1. The applicant shall construct all needed water lines (of county approved sizes) within and along all sides or frontages of any piece of property prior to final approval of the development or the issuance of any certificate of occupancy. Phased construction of the water line system may also be specifically allowed if provided for in a development agreement between the applicant and the county. In lieu of actually constructing the required water line system, the applicant may secure the improvements in accordance with section 20.720.030.

2. Whenever an applicant is required to construct a water line from the applicant's property to the nearest water line outside of the applicant's property, and where, in the opinion of the director, it is necessary that water line be constructed of a larger size than the minimum size needed to serve the property and that the extended water line will be or can be used in the distribution of water to adjacent properties, the director shall require the applicant to construct the larger size water line in accordance with the plans and specifications as approved by the director. Should the director require an oversized water line, the director will reimburse the applicant for the costs of the additional water line size as long as the line is greater than required by the county's design and improvements standards, as set forth in a reimbursement agreement pursuant to chapter 20.460.

3. When the director agrees to pay for an increase in water line size, at least three proposals, signed and prepared by a contractor, shall be required which show the comparable cost of the incremental increase requested by the director. In no event will the county pay more than the lowest proposal presented.

C. If the applicant must extend the water line system through another property owner's property or along the frontages of various intermediate property owners, and if those properties are not currently served by the county's water system, then the intermediate and benefiting property owners shall be responsible, when the development commences or connection is made, for a pro rata share of the costs of the water line extension provided that the parcels were identified in the reimbursement fair share analysis and agreement.

1. When the applicant is required to extend a water line, he shall pay the entire cost of the water line constructed and will be responsible for the actual construction of the water line. Any owners of properties to be served by the extended water main will thereafter be responsible for reimbursing the first property owner for a pro rata share of the costs of the water line system at the time the subsequent owners apply for a permit to plat, parcel, develop, or build upon their parcels or when connection is made for existing buildings.

2. The pro rata shares for the applicant and all subsequent or other owners benefitted by the extended water line must be determined prior to the board entering into the reimbursement agreement. The director shall collect at 15% administrative fee from the applicant who pays for the water line construction upon reimbursement.

3. In no event shall any owners of the property to be served by an extended water line be permitted to connect without first paying to the applicant or to the county water system the pro rata share of the costs described above as well as all other fees required by the director.

D. Any facilities installed pursuant to subsections A through C of this section are the property of the county water system upon inspection and approval by the director.

E. Whenever the county water system, or a contractor hired by the county water system, extends a water main along the frontage of any property not connected to the county water system, the director may elect to install a water service lateral within the public right-of-way or easement adjacent to the property. If the service lateral is installed by the county water system or its contractor, the property owner shall reimburse the county for the costs of the installation prior to connection of the property owner's water system to the water main. For the purposes of this section, the costs which must be reimbursed are the costs incurred by the county water system at the time of the installation and include the county's water system final contract cost for the service and any required pavement replacement.

F. Reimbursement agreements shall be negotiated between the director and the applicant, and approved by the board. If the parties are unable to reach an agreement, the dispute may be presented to the board for resolution. Each agreement shall become null and void and no further reimbursement is obtainable ten years after the recording of the final map that provides for or requires construction of the addition to the water system. (Ord. 883, 1999; Ord. 801, 1998; Ord. 692, 1995) **Back**

#### **20.F.120 Termination and restoration of service.**

A. A customer may have service terminated by giving not less than 5 working days advance notice to the county water system, and provide a mailing address to which the closing bill will be mailed.

Charges for service may be required to be paid until the requested date of discontinuance or a later date that provides not less than the required 5 days advance notice. When notice is not given, the customer shall be required to pay for service until 5 days after county water system had knowledge that the customer had vacated the premises or otherwise had terminated service. Failure to notify the county water service of termination of service shall not relieve the customer or property owner, if other than customer, of responsibility of payment of water bills.

B. Conditions or water uses that create a basis for the county water system to terminate water service include, but are not limited to, the following:

1. A service may be terminated by the director for non-payment of a bill for service furnished if the bill is not paid within 90 days after presentation, provided the county water system has given the customer at least 5 days prior notice of disconnection. The county water system shall charge the cost of disconnection, reconnection, and all ancillary charges associated with the disconnection before premises are reconnected to the water system.

2. The county water system may discontinue service to any customer for violation of any provision of this ordinance after it has given the customer at least 5 days written notice of the disconnection. Where safety of the potable water supply is endangered, service may be terminated without notice.

3. When the county has discovered that a customer has obtained service by a fraudulent means, or has altered the water service for unauthorized use, the service to that customer may be discontinued without notice. The county water system shall not restore service to the customer until the customer has complied with the county water system rules and regulations and the county water system has been reimbursed for the full amount of the service rendered and the actual cost that the county water system has incurred by reason of the fraudulent use.

C. Service will be restored to the customer's premises under the following conditions:

1. The county will endeavor to make reconnections during regular working hours on the day of the request, if conditions permit; otherwise, reconnection will be made on the regular working day following the day the request is made.

2. When a customer has requested that the reconnection be made at other than regular working hours, the county will reasonably endeavor to make the reconnection if practicable under the circumstances, but will be under no obligation to do so.

D. When service is terminated under the provisions of this appendix, the county water system will notify the applicant, by procedures outlined in section 20.F.040 Notices, of the reason for termination of service. Whenever termination of water service will effect more than one dwelling unit, the county water system will make reasonable effort to give notice to all dwelling units. The county shall cause notice to be given at least 5 calendar days but no more than 15 calendar days prior to the date of intended termination. (Ord. 883, 1999) [Back](#)

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