

Lindon City Corporation
WATER CONSERVATION PLAN



March 2015

Prepared by Lindon City Public Works

**With Assistance From
J-U-B Engineers, Inc.**

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INTRODUCTION

Lindon City and its leaders have worked diligently, for many years, to insure adequate water for current and future residents, businesses, and institutions, and will continue to do so. The City owns and operates both a culinary water system and a pressure irrigation system. The culinary water system provides for all domestic water demands requiring a high quality of water and has limited use for outside watering in commercial and industrial areas. It also provides for fire protection. The pressure irrigation system provides for all other outside watering demands using raw water surface sources heretofore used for flood irrigation within the City. The culinary system has evolved over many years since the incorporation of Lindon in 1924. Construction of the pressure irrigation system occurred in 1992-93 and service began in late June of 1993.

Because we are in the second driest state in the nation, water conservation and the wise use of water has been a focal point on both a local and state level. The state legislature in 1998 passed the Utah Water Conservation Plan Act (House Bill 153), revised in the 1999 legislative session (Section 73-10-32 Utah Code Annotated.) This water conservation plan addresses the concerns of leaders and citizens of both Lindon and the State of Utah. The Act relates to water and irrigation, requesting cities to implement and update every 5 years, a water conservation plan.

DESCRIPTION OF OUR CITY AND ITS WATER SYSTEMS

Lindon City is located in northern Utah County approximately 37 miles south of Salt Lake City. The city extends east to the Wasatch Mountains and west to Utah Lake. Lindon City is bounded on the north by Pleasant Grove City and on the South by Orem City and is 1 to 1 1/2 miles wide. The incorporated area of the city is 5,452 acres or approximately 8.5 square miles. In the past 10 years Lindon has grown from a census population of 8,363 in 2000, to 10,070 in 2010, to an estimated current population of about 10,431 (2014). Meeting the future needs of a growing population remains an important concern.

Providing water to meet the needs of its citizens has always been a top priority of city leaders and planners. As a result, well maintained and operated culinary and pressure irrigation water systems provide the citizens of our City with water where and when needed. Growth in number of connections since 2009 is shown in Table 1.

Table 1
User Type

Year	Residential	Commercial	Industrial	Institutional	Total
2009	2,475	227	82	23	2,807
2010	2,641	266	88	25	3,020
2011	2,550	235	80	25	2,890
2012	2,512	222	73	24	2,831
2013	2,589	181	85	23	2,878
2014	2,714	184	112	29	3,039

Open space and preservation of a “Little Bit Of Country” is of high value to our leaders and citizens. Consequently, open space preservation has been a high priority. Lindon City Park is the largest and oldest park centrally located in the city and includes the Lindon City Offices and new Aquatics Center. There is a Public Works Complex, eleven developed parks (containing 50.5 acres), seven future parks (containing 59.13 acres) planned, and a cemetery (currently 3.00 acres with option to expand to 7.0 acres). Of the existing and planned parks, three parks (containing 35.34 acres) will require little or no water. There are two elementary schools and a junior high school with their accompanying athletic fields, playgrounds, and other landscaped areas. Alpine School District operates and maintains these schools and their Water Conservation Plan is included in the appendix.

Lindon City's potable water sources are Dry Canyon springs, east of the city and four deep wells located between State Street and 400 East and Center Street and 700 North. Lindon City installed a pressure irrigation system to accommodate the growing need for outside watering and to preserve the use of surface waters historically used to flood irrigate the land that is being developed. The water supply for the pressure irrigation system comes primarily from the Provo River delivered through the Provo Bench Canal Company/North Union Irrigation Company canal and through the Alpine Aqueduct. This water is available because of the shares owned by Lindon City in the various irrigation/canal companies and in the Deer Creek project. The City also has 924 acre-feet of Contract Water from the Jordanelle Project of the Central Utah Project. This lesser quality surface water, that does not require treatment, conserves the higher quality water for the culinary water system.

Inventory of Water Resources

Lindon City supplied 1,618 acre-feet of water to their culinary water system in calendar year 2010, 1,973 acre-feet in 2011, 1,838 acre-feet in 2012, and 1,778 in 2013, and 1,601 acre-feet in 2014. Wells will supply potable water for future growth. We presently have developed well capacity that will supply up to 6,215 acre-feet, 3.15 times the maximum yearly volume of potable water supplied between 2010 and 2014 (1973.21 acre-feet; see Table 4). Table 2 shows the City-Owned Culinary Water Rights.

**Table 2
City-Owned Water Rights**

Source Name/No.	Water Right #	CFS	Total CFS	Present Yield, AF
DRY CANYON SPRINGS	55-6908	1.34	1.34	592.45
WELL NO. 1	55-416	1.104	1.104	806.559
WELL NO. 2	55-742	0.713	0.713	493.614
WELL NO. 3	55-4478	4.61	4.61	1,419.54
WELL NO. 4	55-4107	6.677	6.677	2,903.61
WELL	55-2298	2.228	2.228	0
WELL	55-2527	0.75	0.75	0
ALL WELLS	55-1670	0.668	0.668	135.97
ALL WELLS	55-1039	0.155	0.155	30.8
ALL WELLS	55-1040	0.52	0.52	77.72
ALL WELLS	55-9400			14
ALL WELLS	55-7873 & 2520			90.38
ALL WELLS	55-12048			5.6
ALL WELLS	55-12066			12.92
ALL WELLS	55-3206			50.4
ALL WELLS	55-8998			30
ALL WELLS	55-286			92.092
ALL WELLS	55-3533			9.57
ALL WELLS	55-3534			2.57
ALL WELLS	55-12164			21.11
ALL WELLS	55-12052			1
TOTAL				6,789.91

Under current water rights, the City is entitled to withdraw more than 13,165 acre-feet annually from the wells shown in Table 2. We have rights that would yield about twice the present developed capacity. We

anticipate that the amount of water needed for future growth will be well within the safe yield for the aquifer supplying the wells. The City no longer seeks nor accepts underground rights (with rare exceptions).

We require that new development turn in water shares from the various irrigation companies that have historically supplied water to land in Lindon. Diversion of this water historically is from streams, springs, shallow wells (artesian) and subsurface drains.

The City owns shares of stock in several local irrigation/canal companies. Water provided under these shares is, and will continue to be, used for irrigation of lawns, gardens, school athletic fields, playgrounds and other landscaped areas, church landscaped and recreation areas, city-owned parks, and other open spaces. Table 3 shows the City owned shares by Irrigation Company.

**Table 3
City-Owned Stock in Local Irrigation Companies**

Irrigation Company	Shares	Yield per Share (100% water year)	Acre-Feet
North Union Irrigation Company	612.957	7	4,172.14
Provo Reservoir Canal			
Orem District	29.23	6	169.38
Alpine District	69.985	6	860.91
Provo River Water Users Assoc.	200	1	200
Central Utah Project	1	1	925
Hollow Water Users			
Whole Stream Shares	325.02	2.87	815.25
Half Stream Shares	0.5	2.87	84.98
Pleasant Grove Irrigation	44.88	1.666	74.77
Cobbley Ditch Company	210.5	1.84	372.6
Provo Bench Canal	84.25	14	630.392
Spring Ditch & Southfield	26.8		

Water Budgets

Table 4 shows the amount of water delivered into the culinary water system and the metered outflows to end-users for the years 2003 to 2014. The numbers shown for years between 2003 and 2009 are for the fiscal year, while the 2010 through 2014 numbers are for the calendar year.

**Table 4
Culinary Water Budget**

	INFLOW (AF)			METERED SALES (AF)						
	Year	Wells	Springs	Total	Residential	Commercial	Industrial	Institutional	Total	%Diff.
Fiscal	2003	1310.52	75.22	1385.74	672.35	187.21	189.70	17.07	1,066.33	23.05%
	2004	1570.50	68.26	1638.76	633.64	184.49	170.84	16.06	1,005.03	38.67%
	2005	1271.38	122.82	1394.20	682.00	199.15	192.68	17.31	1,091.14	21.74%
	2006	1351.74	351.33	1703.07	697.60	296.16	166.59	18.41	1,178.76	30.79%
	2007	1510.22	274.66	1784.88	861.33	296.08	201.27	22.67	1,381.35	22.61%
	2008	1702.55	133.89	1836.44	839.93	242.09	177.77	17.70	1,277.49	30.44%
	2009	1834.58	115.80	1950.38	821.72	394.02	152.64	25.73	1,394.11	33.90%
Calendar	2010	1479.21	138.89	1618.10	728.53	266.27	125.96	18.93	1,139.69	41.98%
	2011	1686.53	286.68	1973.21	756.27	376.59	127.95	18.06	1,278.88	54.29%
	2012	1636.85	200.88	1837.74	825.64	261.11	152.43	14.00	1,253.18	46.65%
	2013	1665.11	112.62	1777.74	852.43	252.99	149.10	17.64	1,272.16	39.74%
	2014	1529.82	70.96	1600.79	744.70	173.15	112.04	17.15	1,047.04	52.89%

The pressure irrigation water supply is metered from each of the water sources delivering water to the system. The services have no meters and so no comparison for a water budget can be made. Table 5 shows the amount of water delivered to the pressure irrigation system for the years 1999 through 2014.

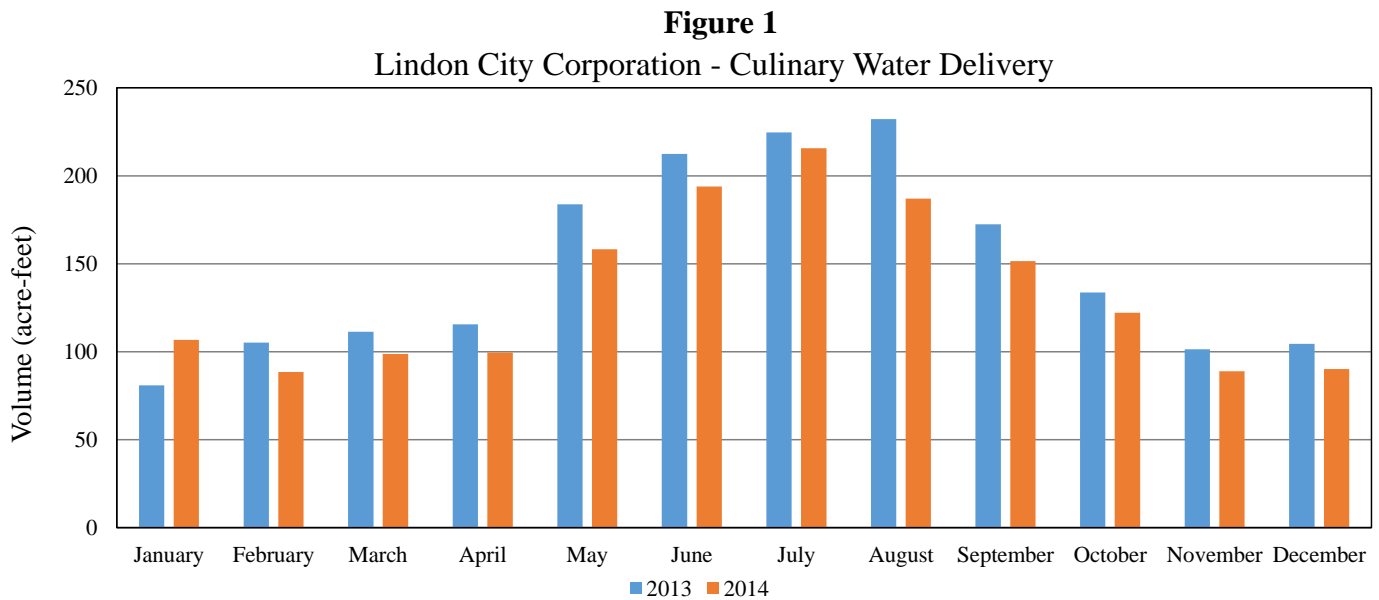
**Table 5
Pressure Irrigation Source**

Year	From North Union Canal		Salt Lake	Alpine 3 (AF)	North Union	Total (AF)
	Gravity (AF)	Pumped (AF)	Aqueduct (AF)		Pump (AF)	
1999						2,913.46
2000	672.33	1,173.80	114.00		1,219.00	3,179.13
2001	842.14	1,275.00	201.00		1,529.00	3,847.14
2002	728.21	1,874.00		919.00		3,521.21
2003	807.72	1,932.00		1,093.00		3,832.72
2004	759.67	1,933.00		1,153.00		3,845.67
2005	751.17	1,344.00		1,262.00		3,357.17
2006	640.05	1,364.91		1,509.00		3,513.96
2007	1,008.91	1,691.72		1,787.00		4,487.62
2008	1,008.91	1,329.84		1,707.00		4,045.74
2009	908.02	1,187.01		1,526.00		3,621.03
2010	1,008.91	1,179.60		1,574.00		3,762.51
2011	1,008.91	1,099.16		1,396.00		3,504.06
2012	1,008.91	1,289.87		2,079.00		4,377.78
2013	1,008.91	899.70		1,862.00		3,770.61
2014	1,008.91	781.39		2,031.00		3,821.30

Present Water Use and Future Water Needs

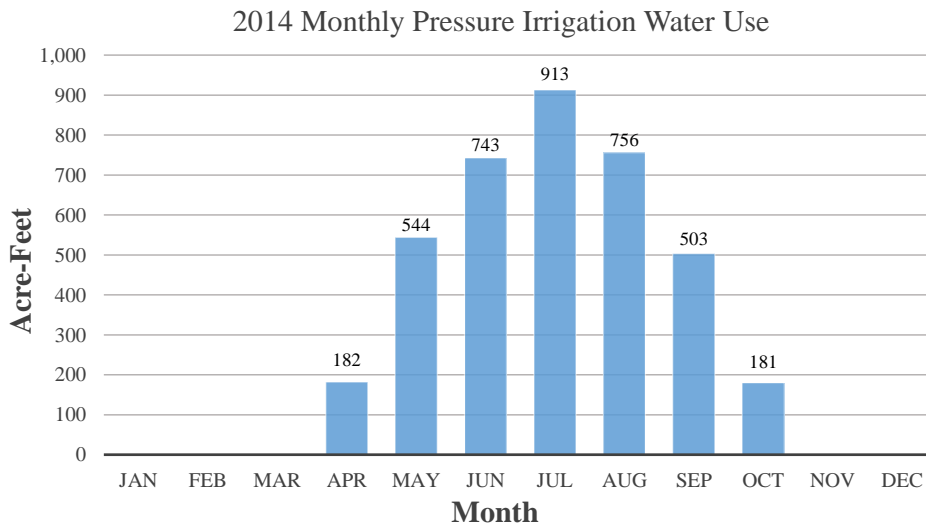
All uses (residential, commercial, industrial, and institutional) of culinary grade water (approximately 1,601 ac-ft) divided by the number of people living in Lindon in 2014 (approximately 10,431 people) makes the average daily use approximately 137 gallons of water per capita per day (gpcd). All uses of irrigation grade water in 2014 (approximately 3,821.3 ac-ft) divided by the number of people living in Lindon in 2014 makes the average daily use approximately 622 gallons of water per capita per day (gpcd) during the 2014 irrigation season of 192 days, which equates to an annual average irrigation use of 327 gpcd. The total average daily water use is 464 gallons of water per capita per day (gpcd). The statewide average is 293 gpcd and 184 gpcd nationally. The statewide and national numbers do not consider all uses, and so a direct comparison cannot be made. Our per capita use is likely higher because of the large amount of green space discussed earlier and the size of residential lots (the typical lot is 20,000 to 24,000 square feet.)

Total monthly water use in the culinary system for 2013 and 2014 is shown in Figure 1.



The total monthly water use in the pressure irrigation system is shown in Figure 2. The system is “charged” around April 15 and drained between October 15 and October 30 each year.

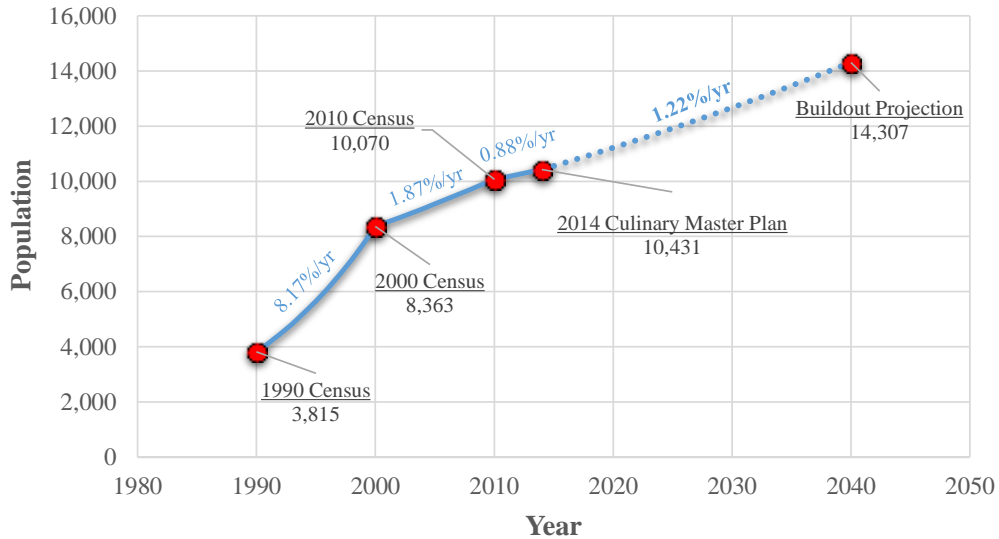
Figure 2



During the 1990's, especially the last half of that decade, Lindon had an annual growth rate of about 8 percent. That has slowed during the years of 2001 to 2005 to about 3 percent. Using a 2 percent annual growth rate resulted in the population projected to the year 2020. Figure 3 shows the population history and projections.

Figure 3

**Lindon City Population, Actual and Projected
1990-2040**



WATER PROBLEMS, CONSERVATION MEASURES AND GOALS

Problems Identified

The City Staff in conjunction with their City Engineering Consultant identified and prioritized several problems during the investigative phase of preparing this Water Conservation Plan.

- Water not metered, accounted for, and/or billed, such as city owned facilities, water used for flushing sanitary sewer and storm drain lines, and water used for street sweeping. This is evident by the inflow and metered sales shown in Table 4, Culinary Water Budget.
- Contractor authorized use or unauthorized use of water for construction purposes. Authorized use is metered by a hydrant meter provided by the City, reported and billed separately. However, the usage is not included in the metered water sales. Unauthorized use is contractors obtaining water from hydrants without having notified the city.
- Citizens lack understanding and fail to implement landscape water requirements and efficient water-use habits and practices. Few residences know how much water is required to maintain healthy landscaped areas and how to consistently use water efficiently indoors. Many citizens' irrigation and indoor practices are based on convenience rather than plant needs and water supply considerations.
- Our families have landscapes with large areas of grass and other water intensive landscaping. Over watering of lawns, shrubs, and landscaped areas from the pressure irrigation system occurs, partly due to water being un-metered to the user and poor watering practices.
- The current culinary water pricing and billing system lacks incentives and sufficient information for residents and businesses to use water more efficiently. The current structure may not be adequate to cover expenses in the water enterprise fund. This will not be known until the water budget discrepancies are resolved.

Each problem represents an opportunity. The opportunity exists to solve the above problems through a combination of education, reduction in high water-use landscaping, accounting for all water delivered from the culinary and pressure irrigation systems, and a well-thought-out water-pricing program.

The opportunity exists to prepare a new generation of wise-water users. This can be assisted with a strong sustained water education program in the public and private schools.

Additional opportunities can be found in two of the remaining problems. Implement increased enforcement, with appropriate fines, for unauthorized use of water by contractors and others. Promoting guidelines for water thrifty plants, shrubs, and landscaping concepts. Planter areas along existing and future roads could be more easily maintained if low water-use shrubs, mulches, and decorative rock were used instead of Kentucky blue grass.

Installation of meters on the remaining unmetered culinary services to city owned facilities and "billing" the appropriate fund for the water used rather than having the water fund carry the burden. Bill the appropriate funds for irrigation for parks and open space.

Water Conservation Goals

In pursuit of solutions to the problems identified previously, and in light of the variety of conservation measures available to solve these problems, the following goals have been identified:

- **GOAL #1**
Continue to install water meters on all City owned facilities that use culinary water.
Metering these facilities will allow billing the appropriate fund for water use payable to the

water fund. Meters have been installed at existing City owned facilities except Creekside Park restrooms, and the Geneva Road landscaping from 200 South to Center Street.

- **GOAL #2**
Continue to bill for water supplied from the pressure irrigation system to city parks and public properties. The operation and maintenance cost for parks, public properties are paid for from general funds, and that fund should pay the water fund for services rendered.
- **GOAL #3**
Maintain financially viable water systems. The water pricing system should encourage customers to reduce use without creating a revenue shortfall. City facilities and irrigation needs supplied by the culinary system be billed for water used.
- **GOAL #4**
Continue education of water conservation practices. Continue the ongoing education program with emphasis on elementary grades 4 & 5. Continue to provide information on an annual basis regarding efficient use of water to all users of both systems.

CURRENT CONSERVATION PRACTICES

In order to solve the problems identified above and take advantage of the many associated opportunities, specific water conservation measures must be identified and evaluated. Our City has already implemented several water conservation measures; these, along with additional measures that will effectively help us manage Our City's water systems, are discussed below.

Having both culinary and pressure irrigation systems provides greater flexibility in dealing with water conservation. Our City's current water conservation program is directed at managing water shortages in the culinary system in emergency events, such as losing a well and providing useful material to assist residents to use water more efficiently indoors. We go into elementary classrooms with a prepared presentation to teach students fundamentals of water conservation. We have begun a water meter-testing program to identify inaccurate and obsolete meters and replace them. We continue to monitor our water rate structure with the goal of maintaining financially viable water systems while promoting conservation.

Our rates are automatically adjustment annually based the April Consumer Price Index (CPI). Water conservation for the pressure irrigation system is directed at education and information sharing regarding the water available for a given water year. Through recent drought years, we have not had to eliminate outside watering.

Current measures include a water conservation contingency plan, water education program for outdoor and indoor water use, and consideration of a conservation oriented water rate structure.

1. Water Conservation Contingency Plan

The city has a "Water Conservation Contingency Plan" that spells out climate and political realities related to water use during drought or other water supply shortages. Also addressed are the conservation measures that may be implemented during times of emergency. They are as follows:

Level 1 – Normal Supply

- Eliminate outside watering on all property from 10 a.m. to 6 p.m.

- Promote voluntary public conservation measures.
- Issue information to all customers on conservation procedures each can accomplish around their own property and within their own homes.

Level 2 – 75% of Normal Supply

- Educate the public on the water supply decreases.
- Initiate mandatory public conservation measures.
- Enforce outside watering restrictions including watering times and quantities.

Level 3 – 50% of Normal Supply

- Strictly enforce all conservation policies with significant fines for non-compliance.
- Physically restrict water supplies to (in order of priority):
 - All outside irrigation systems
 - Park properties and other non-essential support facilities
 - Commercial businesses, restricting largest users first
 - Residential areas
 - Any other “non-life support” areas, insuring water supplies to hospitals, hospices, and all other health care facilities, and controlled designated area water facilities.

Additional non-emergency water conservation measures are listed below.

2. Water Education Program

The following information on efficient outdoor and indoor water use is available to the citizens of Lindon through the City Center, Public Works, Elementary School Programs, Lindon Fair and is occasionally distributed with the water bill.

Outdoor Water Use:

- ◆ Use pressure irrigation system for landscaping, if available. Most residential and some commercial areas have the pressure irrigation system in Lindon.
- ◆ Water landscape only as much as required by the type of landscape, and the specific weather patterns of your area, including cutting back on watering times in the spring and fall.
- ◆ Do not water on windy days and/or rainy days.
- ◆ Do not water during the hours of 10:00 AM and 6:00 PM.

- ◆ Sweep sidewalks and driveways instead of using the hose to clean them.
- ◆ Wash your car from a bucket of soapy (biodegradable) water and rinse while parked on or near the grass or landscape so that all the water running off goes to beneficial use instead of running down the gutter to waste.
- ◆ Check for and repair leaks in all pipes, valves etc. for secondary, faucets, hoses etc. on culinary. Verify there are no leaks by turning everything off and checking your water meter to see if it is still running. Some underground leaks may not be visible due to draining off into storm drains, ditches, or traveling outside your property. Periodic checks by city on their secondary boxes for leaks.
- ◆ Adjust and repair sprinkler heads to maintain proper spray patterns and eliminate waste.
- ◆ Periodically check and adjust timers on sprinkling systems.
- ◆ Use mulch around trees and shrubs, as well as in your garden to retain as much moisture as possible. Areas with drip systems will use much less water, particularly during hot, dry and windy conditions.
- ◆ Keep your lawn well trimmed and all other landscaped areas free of weeds to reduce overall water needs of your yard. Discourage water fountains. Encourage low water landscaping at interchanges, planting strips, etc in the city.

Indoor Water Use:

About two-thirds of the total water used in a household is used in the bathroom. Concentrate on reducing your bathroom use. Following are suggestions for this specific area:

- ◆ Do not use your toilet as a wastebasket. Put all tissues, wrappers, diapers, cigarette butts, etc. in the trashcan.
- ◆ Check the toilet for leaks. Is the water level too high? Put a few drops of food coloring in the tank. If the bowl water becomes colored without flushing, there is a leak.
- ◆ If you do not have a low volume flush toilet, put a plastic bottle full of sand and water to reduce the amount of water used per flush. However, be careful not to over conserve to the point of having to flush twice to make the toilet work. Also, be sure the containers used do not interfere with the flushing mechanism.
- ◆ Take short showers with the water turned up only as much as necessary. Turn the shower off while soaping up or shampooing. Install low flow showerheads and/or other flow restriction devices.
- ◆ Do not let the water run while shaving or brushing your teeth. Fill the sink or a glass instead.
- ◆ When doing laundry, make sure you always wash a full load or adjust the water level appropriately if your machine will do that. Most machines use 40 gallons or more for each load, whether it is two socks or a week's worth of clothes.

- ◆ Repair any leak within the household. Even a minor slow drip can waste up to 15 to 20 gallons of water a day.
- ◆ Know where your main shutoff valve is and make sure that it works. Shutting the water off yourself when a pipe breaks or a leak occurs will not only save water, but also eliminate or minimize damage to your personal property.
- ◆ Keep a jar of water in the refrigerator for a cold drink instead of running water from the tap until it gets cold. You are putting several glasses of water down the drain for one cold drink.
- ◆ Plug the sink when rinsing vegetables, dishes, or anything else; use only a sink full of water instead of continually running water down the drain.

3. Water Rates

Designing an appropriate rate structure is a complex task. Rate design is a process of matching the costs of operating the water system to the unique economic, political, and social environments in which the city provides its service. The cost of delivering the service must be evaluated and understood. Each water system has unique assets and constraints. Based on the characteristics of the system, and past capital and operating costs, revenue requirements can be estimated. Tables 6 and 7 show the current rate structure for culinary and pressure irrigation.

Table 6
Current Monthly Culinary Water Rates

Meter Size	1-inch	1 1/2-inch	2-inch	3-inch	4-inch	6-inch
Zone 2 & 3						
Base Rate	\$ 16.17	\$ 29.11	\$ 46.89	\$ 177.87	\$ 323.40	\$ 599.91
Base Allocation	0 gal	0 gal	0 gal	0 gal	0 gal	0 gal
Volume Charge (per 1Kgal)	\$ 1.33	\$ 1.33	\$ 1.33	\$ 1.33	\$ 1.33	\$ 1.33
Zone 1						
Base Rate	\$ 17.51	\$ 31.52	\$ 50.78	\$ 192.61	\$ 350.20	\$ 649.62
Base Allocation	0 gal	0 gal	0 gal	0 gal	0 gal	0 gal
Volume Charge (per 1Kgal)	\$ 1.40	\$ 1.40	\$ 1.40	\$ 1.40	\$ 1.40	\$ 1.40
Zone 0						
Base Rate	\$ 26.24	\$ 47.23	\$ 76.10	\$ 288.64	\$ 524.80	\$ 973.50
Base Allocation	0 gal	0 gal	0 gal	0 gal	0 gal	0 gal
Volume Charge (per 1Kgal)	\$ 1.63	\$ 1.63	\$ 1.63	\$ 1.63	\$ 1.63	\$ 1.63

The reason for the different rates for different zones is pumping costs to boost the water up to higher developed areas of the city. The City does a Water Systems Rate Analysis about every 3 to 5 years. Based the results of the analysis the City Council may make changes. Also, in an effort to increase the accuracy of water billing, the water meters are read every month.

**Table 7
Current Pressure Irrigation Service Size and Water Rates**

Service Size Based on Lot Area		Water Rate Based on Lot Area - Non-Agricultural -	
Service Size	Service Area	Lot Area (SF)	Monthly Rate
1-inch	1 acre or less	0 to 11,000	\$8.00
1 1/2-inch	1 to 2 acres	11,001 to 21,000	\$10.00
2-inch	2+ acres	21,001 to 28,000	\$15.00
		28,001 to 40,000	\$20.00
		40,001 to 60,000	\$30.00
		60,001 to 80,000	\$40.00
		80,001 to 87,120	\$50.00
		2 acres or more	\$50.00 + \$3.00 per each 1/4 acre
		- Agricultural -	
		Base Rate	\$10.00
		Each Additional Acre	\$3.00 per acre

POSSIBLE ADDITIONAL CONSERVATION MEASURES

In order to effectively meet our City’s future water needs and solve all the water problems identified, additional and more specific water conservation measures will be required. These include water rates that are more stringent; meter replacement and leak repair improved efficiency of irrigation at city parks and other open spaces, education, and plumbing fixture replacement.

1. More Stringent Water Rate Structure

The current culinary water rates may need to be increased following implementation of the recommendations in Water Rates above. As part of the investigation, a different rate schedule designed to provide additional price incentives for efficient water use to show the customer how much water is needed each month and provide funding for water conservation assistance and education. This rate schedule is called “Target Billing”.

This rate schedule is designed to meet revenue requirements while creating funding for the water conservation program from fees paid by those who waste water. Water users, who use water indiscriminately and fall into the most expensive tier, will experience a volume charge of \$6.00/Kgal for the last block.

Table 8
Possible Water Rate Structure

Type:	Target Billing
Base Charge	\$16.17
Base Allocation	0 Kgal/month
% of Target	Rate
0 - 50%	\$1.33/Kgal
51 - 100%	\$1.46/Kgal
101 - 150%	\$2.00/Kgal
151 - 200%	\$3.00/Kgal
201% +	\$6.00/Kgal

2. Meter Replacement and Leak Detection Program

Over time, all meters become less accurate in recording actual flows. This leads to lost revenue to the city and inaccurate data to citizens. For example, if a survey of sufficient randomly chosen meters revealed that nearly 10 percent of the water delivered is not being registered on the meters. City income from metered water is more than \$1,060,000. The 10% not registering represents \$106,000. When sewer revenues, which are calculated based on metered usage, are accounted for, total revenue lost dependent on metered deliveries is greater.

3. Education

Education of residents and businesses as to efficient use of water indoors and for irrigation will continue. Education will continue at the local schools. This process will result in a generation of responsible efficient water users.

4. Plumbing Fixture Replacement

Incentives to exchange old high water-use toilets and shower heads for new ones that are more efficient can be provided through city cost sharing using revenues generated by penalty tiers in the rate schedule. While it is difficult to calculate meaningful estimates of the benefits and costs of such programs on the water-use rate, there is ample evidence in the literature that such programs are effective. The Division of Water Resources estimated in 1995 that such programs could reduce residential indoor water use by 33 percent.

Many of the city's homes and businesses have been built since 1992 when plumbing codes were revised to require low water-use toilets and low flow showerheads in new construction.

COST ANALYSIS

Our City reached the previous plan Goal #1 (Install water meters at the Lindon City Center, Public Works Complex, and City Park complexes that use culinary water) by June 30, 2005.

Benefit of Reaching Goal #1:

The result of installing water meters at the city-owned facilities and parks is more accurate accounting of the water used and a more correct water budget comparison to evaluate per capita use compared with State and National per capita use. Payment of revenues to the Water Fund from other funds receiving benefit of service from the water systems gives a more accurate basis on which to determine future water rates. Culinary use in most city parks is limited to rest rooms, drinking fountains, and hose spigots by the pavilions. All new parks will have meters installed.

Cost of Reaching Goal #1:

The cost incurred to achieve this goal is a one-time cost to install the meters. The labor and equipment will be provided by existing city personnel using city owned equipment. The costs are as follows:

- ◆ Creekside Park - \$1,000
- ◆ Geneva Road Landscaping from 200 South to Center Street – \$1,000

Benefit of Reaching Goal #2:

The result of billing for water supplied from the pressure irrigation system to city parks and public properties will be increased revenue to the water fund. The increased revenue will reduce the deficit in the water fund. The increased revenue will make evaluation of water rates more accurate and equitable. For example the monthly rate for Pioneer Park, 4-acres, is \$98.00 for an annual total of \$1,176.

Cost of Reaching Goal #2:

In order to begin this billing process the irrigable area of each lot will need to be determined and an account set up in the billing system to which to bill using the non-agricultural - 2 acres or more rate in the pressure irrigation rate structure. The cost of this will be included with each new park constructed.

Benefit of Reaching Goal #3:

A financially viable water system will insure that the utility can provide service at a reasonable price to all of the users. The rate structure will encourage conservation and require the abusers of the system to pay a higher rate. All users, both public and private, will pay for water used.

Cost of Reaching Goal #3:

The next water systems rate analysis expected completion is April 30, 2015. The cost of the complete rate analysis will be \$2,000 to \$3,000. This will determine the adequacy of the rate structure and provide information regarding any adjustments needed.

Benefit of Reaching Goal #4:

Continuing the education program, particularly in elementary grades 4 and 5, will develop a generation of water conservation minded customers. This age group also has an impact on their parents as they learn and then observe the water use habits at their home. Water conservation is a part

of a comprehensive approach to water resource management.

Cost of Reaching Goal #4:

The annual budget for this program varies, especially in difficult economic times. The City typically budgets \$3,000 to \$5,000 annually for this program. This includes preparation of information distributed to the students as well as information sent with the utility bill regarding conservation practices. Public Works has assigned these responsibilities to the administrative assistant to the Public Works Director.

IMPLEMENTING/UPDATING THE WATER CONSERVATION PLAN

To insure the goals outlined above are reached, appropriate tasks must be determined, responsibility fixed with the logical person or department, and a time line set for completion of each task. The city administrator and city staff will be responsible to carry out the necessary tasks within the appropriate time constraints.

This water conservation plan will be on the City Council agenda for adoption March 17, 2015. The members of the City Council are:

Jeff Acerson, Mayor

Randi Powell, Council Member

Matt Bean, Council Member

Jake Hoyt, Council Member

Van Broderick, Council Member

Carolyn Lundberg, Council Member

It was also recommended that the city administrator make quarterly reports on progress toward goals to the city council. The water conservation plan will be revised and updated as required to meet changing conditions and needs. This plan will be updated and resubmitted to the Utah Division of Water Resources in December 2019, as required by legislative House Bill 153. The ordaining ordinance for the water conservation plan is attached as Appendix A.

APPENDIX A – Water Conservation Plan Ordinance

ORDINANCE NO. 2005-1

AN ORDINANCE OF THE CITY COUNCIL OF LINDON CITY, UTAH COUNTY, UTAH, ADDING A WATER CONSERVATION PLAN ORDINANCE BY ADOPTING SECTION 13.32 "WATER CONSERVATION PLAN" INTO THE LINDON CITY CODE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the adoption of a water conservation plan has been mandated by the State of Utah; and

WHEREAS, Lindon City operates a culinary water system and a pressurized irrigation system; and

WHEREAS, the Lindon City Council understands the pressing need to use water in a more efficient manner to allow for future sustained growth of the community; and

WHEREAS, city staff have caused a water conservation plan to be created; and

WHEREAS, the next and final step in putting a water conservation plan into place for Lindon City is the adoption of a water conservation plan ordinance; and

WHEREAS, the Municipal Council of Lindon City desires to adopt a water conservation plan ordinance for the health, safety and welfare of the citizens of Lindon City and place the ordinance into the Lindon City Code; and

WHEREAS, the ordinance being adopted will achieve this stated purpose;

NOW, THEREFORE, BE IT ORDAINED by the City Council of Lindon City, Utah County, State of Utah, as follows:

SECTION I: Section 13.32 of the Lindon City Code is hereby added and will read as follows:

13.30.010 Short Title and Purpose.

1. This ordinance shall be known as the "Water Conservation Plan Ordinance."
2. The purpose of this ordinance is to create a plan for water conservation in Lindon City by the establishment of water conservation measures and goals.

13.30.020 Establishment of Conservation Measures and Goals. There is hereby established a set of conservation measures and goals for Lindon City as detailed in the Water Conservation Plan.

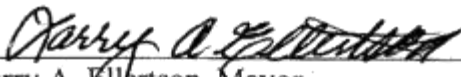
13.30.030 The Water Conservation Plan of Lindon City is hereby adopted on January 4, 2005. The plan will be amended no less than every five years and will continue to play a vital role in the future development of Lindon City, Utah.

SECTION II: The provisions of this ordinance and the provisions adopted or incorporated by reference are severable.

SECTION III: Provisions of other ordinances in conflict with this ordinance and the provisions adopted or incorporated by reference are hereby repealed or amended as provided herein.

SECTION IV: This ordinance shall take effect upon the date of posting.

PASSED AND ADOPTED by the Lindon City Council on this 4th day of JANUARY, 2005.


Larry A. Ellertson, Mayor

ATTEST:


Ott H. Dameron, City Administrator/Recorder



APPENDIX B – Alpine School District Water Conservation Plan

**ALPINE SCHOOL DISTRICT
WATER CONSERVATION PLAN
MAY 4, 2004**

Objective

Alpine School District is a major water user in Utah County due to the number of schools with their accompanying athletic fields, playgrounds and other landscaped areas. It is recognized that water conservation measures at these schools could significantly reduce the demand on municipal water systems during the watering season. It is the goal of Alpine School District to implement measures which will assure that grounds are maintained with the least amount of water necessary. Several areas of emphasis have been identified which could help in the water conservation effort. These include:

- Education of water users
- Maintenance of irrigation systems
- Monitoring of soil moisture
- Soil enhancement
- Drought tolerant landscaping

Education of water users

Administrators and custodians occasionally react to lawn and landscape watering by over watering. They do not recognize that too frequent watering of lawns prevents the development of healthy root systems, thus perpetuating the ongoing necessity for frequent watering. Under most circumstances, once weekly watering in warm weather and twice weekly watering in hot weather are sufficient. Less frequent, deep watering will help develop healthy root systems and should result in the need for less water.

Training for custodians has been, and will continue to be conducted through the maintenance department. Information on proper watering and maintenance of irrigation systems will be disseminated and guest speakers will present information on proper watering. They will also be expected to observe weather conditions and to turn off sprinkler systems during rainy weather.

Custodians will be required to set their time clocks to avoid watering in the middle of the day where possible. Typically this would include the hours between 10:00 a.m. and 6:00 p.m.

Maintenance personnel and custodians are encouraged to attend Water Use Workshops sponsored by the Central Utah Water Conservancy District. Schedules for these classes will be distributed to the head custodians.

Maintenance of irrigation systems

Administrators and custodians will be required to monitor their sprinkler systems on a regular basis to identify water leaks and malfunctioning sprinkler heads. This should help reduce water waste and to assure that all areas are receiving the proper amount of water. Recent changes in the summer cleaning program will allow more custodial hours in the schools during the summer months. Recommendations will be made to head custodians to use some of these additional custodial hours in assigning specific responsibility for an individual to regularly inspect the sprinkler system to assure that it is functioning properly. It is expected that the system be thoroughly inspected at least weekly during the irrigation season.

All custodians who perform ground maintenance should be trained to identify watering problems and report them immediately to the head custodian, who should in turn either repair the problem with his/her own forces or issue a work order to the maintenance department. Maintenance department will give priority to the repair of malfunctioning sprinkler systems.

Monitoring of soil moisture

The maintenance department currently has a pilot soil monitoring program in place at a junior high school. The effectiveness of this system in reducing water usage will be evaluated. Based on the results of this pilot program additional monitoring systems will be installed and specified in new school construction. The maintenance department will pursue matching grants for soil monitoring systems as grant funds become available. There may be funds available through the Central Utah Water Conservancy District after July 1, 2004.

Soil enhancement

The maintenance department has an ongoing program to analyze soil conditions and provide soil enhancement where necessary. This includes aeration, applying compost and fertilizer, and applying materials to increase the ability of the soil to retain moisture.

Drought tolerant landscaping

Consideration will be given to the use of drought tolerant landscaping, where practical. This includes the use of grasses and plants which require less water. In areas where turf lawns are not necessary, consideration will be given to xeriscape designs which require little or no watering.

Water Use Workshops

May 25, 2004

June 15, 2004

9:00 a.m. to 3:00 p.m.

\$10.00 fee

Call Lori Johnson at 435-797-2255 to register

Central Utah Water Conservancy District 355 West University Parkway

Orem, Utah 84058

801-226-7100

Additional information

Contact the Utah Division of Water Resources at 801-538-7254. Web page: www.conservewater.utah.gov