



North Logan City Water Conservation Report

NORTH LOGAN CITY, UTAH

FEBRUARY 2019

WATER CONSERVATION REPORT

**NORTH LOGAN CITY, UTAH
JANUARY 2019**

Submitted To:

Faye Rutishauser
State Water Conservation Coordinator
Utah Division of Water Resources
P.O. Box 146201
Salt Lake City, Utah 84114-6201

Prepared For:

***North Logan City
2076 North 1200 East
North Logan, UT 84341***

PREPARED BY:

Lance Anderson, P.E.
Megan Montgomery, EIT
CACHE-LANDMARK ENGINEERING
95 Golf Course Road Suite 101
LOGAN, UTAH 84321
PHONE: (435) 713-0099
FAX: (435) 713-0

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1.0 DESCRIPTION OF NORTH LOGAN WATER SYSTEM

North Logan City is located in Cache Valley near the Northeast corner of Utah. This growing city is located near Utah State University and the mouth of Green Canyon. North Logan's current population is approximately 10,646. Other cities in the vicinity include Logan, with an approximate population of 51,100, and Hyde Park with an approximate population of 4,600.

North Logan City currently (2017) provides culinary water to 2,518 connections (see Figure 1 for a map of the current service area). Of these connections, 2,284 are residential, 142 are commercial, 58 are institutional, and 34 are industrial. In addition to culinary water, North Logan City and approximately 50 percent of North Logan City residents have access to secondary water.

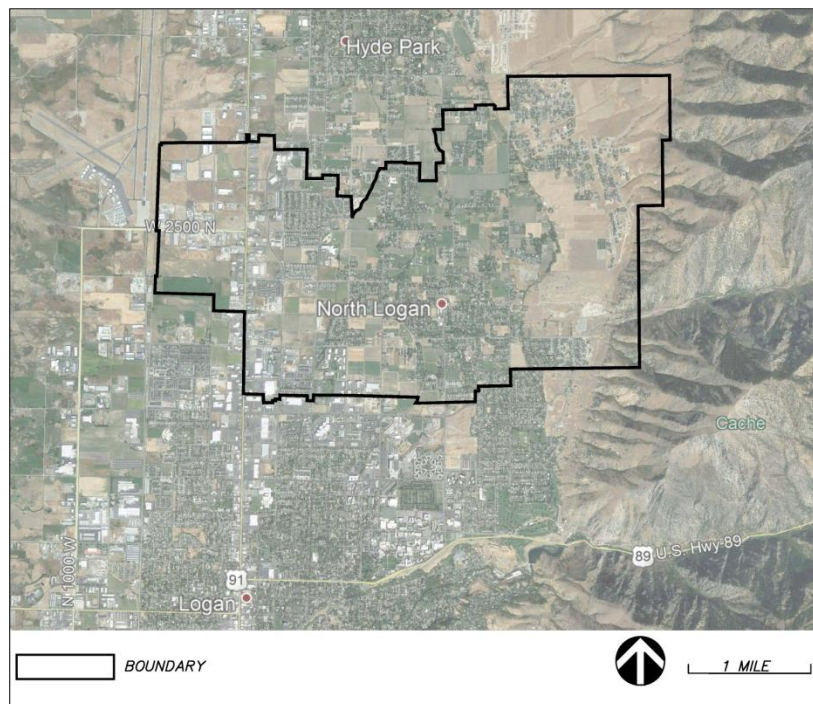


Figure 1. Current Service Area

North Logan receives the majority of its culinary water supply from springs in Green Canyon. In addition, North Logan has six wells. Four wells are located at the mouth of Green Canyon, one is near Beef Hollow, and one is located at approximately 1800 N 100 W in North Logan. The City has four water storage tanks. Two tanks are located at the mouth of Green Canyon and two tanks are located near Beef Hollow. The tanks are 0.5, 1.0, 1.0, and 0.5 million gallons respectively. Existing pipe in North Logan is mostly ductile iron with some PVC and galvanized iron. These pipes are in good condition. The oldest pipes were installed in the mid-1960s.

Connecting the water sources to the storage facilities are a series of booster stations. These stations allow water to feed from their sources to storage tanks, providing redundancy in the system.

All connections in North Logan are metered with touch read or radio read meters. The City currently has a replacement program to update meters and improve accuracy.

1.1 Population Growth

North Logan City is growing. Table 1 shows the historic population of North Logan and future growth projections through 2050.

Table 1. Population Estimates

Year	Population
1950	535
1960	741
1970	1,405
1980	2,258
1990	3,768
2000	6,163
2010	8,269
Current (2017)	~10,646
2020	11,641
2030	14,964
2040	16,708
2050	18,597

Source: Governor's Office of Planning and Budget (2012)

1.2 Water Supply

North Logan City has seven culinary water sources. These sources consist of six wells and several springs, which are referred to as the Water Canyon Creek Springs. The springs are combined and metered together at the Green Canyon Water Treatment Plant. Table 2 shows the water sources and the potential capacities of the sources based on historical data. Table 3 describes North Logan's water right information.

Table 2. Water Sources and Capacity

Source	Volume (gpm)	Total (gpm)	AF/Year
Wells		5265	8,493
Green Canyon Well 1	580		
Green Canyon Well 2	420		
Green Canyon Well 3*	175		
Green Canyon Well 4	2250		
Beef Hollow Well	40		
1 st West Well (Jacks Well)	1800		
Springs/Surface		936-1040	1,510-1,678
Springs from Water Canyon**	936-1040		
* Well under the influence of surface water			
** Includes four springs and surface water from runoff			

Table 3. North Logan's Water Rights

Water Right	Water Source	Flow (cfs)	Flow (AF/Year)
25-9568	Underground Wells	1.45	241.85 (limitation)
25-3425	Underground Wells	4.9	3547.44
25-3199	Unnamed Springs and Water Canyon Creek	0.558	403.95
25-3063	Unnamed Springs and Water Canyon Creek	0.87	629.85
25-5421	Unnamed Springs and Water Canyon Creek	4.0	2895.87
Total		11.78	7718.96

North Logan City has also purchased several shares in local canal companies for irrigating land and parks owned by the City. Table 4 details the water shares owned by North Logan City. In addition, approximately 50 percent of North Logan residents have access to secondary water they purchase from canal companies. The majority of these customers are served by pressurized pipe. Flood irrigation is used in some agricultural areas. Secondary water is only metered in some of the newer subdivisions.

Table 4. Purchased Secondary Water

Canal Company	Shares
Cache Highline Canal	26.74
Cache Highline Canal	8.75
Hyde Park Canal	57
Total	92.49

1.3 Water Usage

In 2017, North Logan City provided 1,783 acre-feet of culinary water to 2,518 connections (see Table 6). This corresponds to a per capita use of

approximately 150 gallons per day (gpcd). Table 5 shows a breakdown of the daily water usage per capita by type of connection. Figure 2 shows how the per capita use has changed since 2000. The quantity of water delivered by public water suppliers averages 210 gpcd in Utah. However, North Logan’s per capita use does not include secondary water. It is likely that the City’s water consumption would be similar to the state average if secondary water use was included.

Table 5. Per Capita Use by Type

Type of Use	Current GPCD
Residential	106.07
Commercial	27.51
Industrial	4.68
Institutional	11.19
Total	149.46

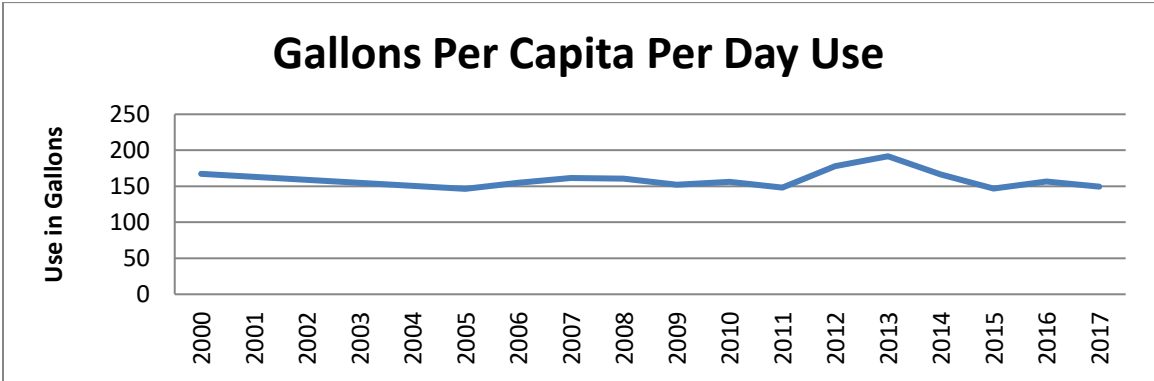


Figure 2. Per Capita Water Use

Table 6. Culinary Water Connections

Type	Connections	Water Use (AF/Year)
Residential	2284	1265
Commercial	142	328
Industrial	34	56
Institutional	58	133
Unmetered	0	0
Stock	0	0
Other	0	0
Total	2518	1782

Table 7 shows the projected water demand for North Logan City through 2050. This assumes water use remains at a constant 150 gpcd. The state

average of 210 gpcd is shown for comparison. In the year 2050, North Logan is anticipated to need 3,114 AF/year of water, which is less than half of the amount of water the City has rights for (see Table 3). North Logan should have an adequate water supply through 2050. However, the water demands in the table are based on average flow conditions and not peak demands. The demand is also based on water use data from metered connections, not the actual amount of water supplied by the wells and springs. North Logan typically supplies about 17 percent more water than is being used by its customers. This discrepancy is assumed to come from overflows at the tank, fire hydrant use, residential meter errors, and system leaks.

Table 7. Future Water Use

Year	Population	Water Demand 150 gpcd (AF/Year)	Water Demand 210 gpcd (AF/Year)
2017	10,646	1,782	2,504
2020	11,641	1,949	2,739
2030	14,964	2,505	3,520
2040	16,708	2,797	3,930
2050	18,597	3,114	4,375

The City would like to continue conservation efforts and has made a goal to conserve 15 percent of culinary water by 2050. Water conservation will be measured through user meters. Figure 3 shows the water supply, anticipated demand with no conservation, and anticipated demand with 15 percent conservation by 2050 (efficient use).

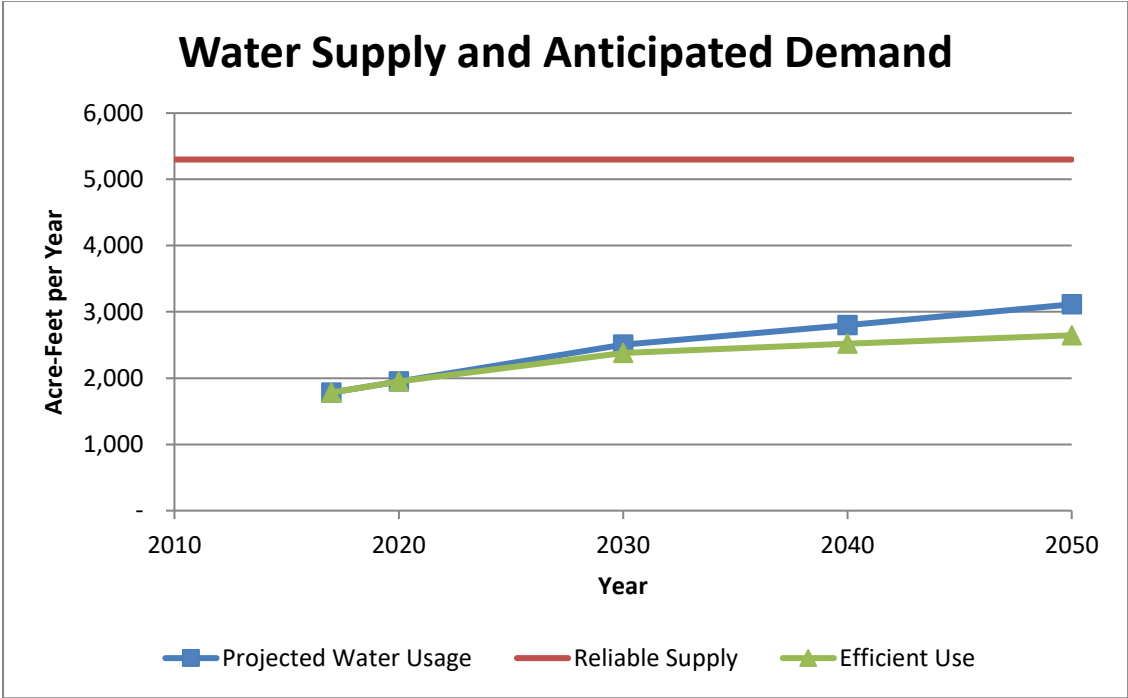


Figure 3. Water Supply and Anticipated Demand

1.4 Water Measurement

North Logan City measures culinary water through water meters. These meters are read on a monthly basis. The meters are calibrated every 3 years and replaced every 10 to 15 years. Currently there are approximately one thousand meters in need of replacement. North Logan City does not measure secondary water use. Secondary water usage measurements are done by the canal companies that supply the water.

2.0 WATER PROBLEMS, CONSERVATION MEASURES, & GOALS

2.1 Water System Problems and Goals

Unaccounted System Losses

Problem: North Logan is unable to account for approximately 17 percent of the water measured through their master meters. This discrepancy is assumed to come from overflows at the tank, fire hydrant use, residential meter errors, and system leaks. It is believed that leakage from the system is minimal because it has been reported that the distribution system piping is in good condition. Table 8 shows the amount of water lost each year from 2005 through 2017.

Table 8. Water Losses

Year	Total Diverted (AF)	Total Used (AF)	Total Lost (AF)
2005	1602	1214	388
2006	1746	1317	429
2007	1470	1411	59
2008	1808	1440	368
2009	1851	1380	471
2010	1752	1433	319
2011	1939	1374	566
2012	2117	1655	462
2013	2124	1804	320
2014	2317	1549	768
2015	1734	1625	109
2016	1853	1730	123
2017	2268	1782	485

Goal: Reduce unaccounted system losses to 15 percent within 5 years. This percentage is calculated by comparing water produced from the various sources to water sold to customers.

Actions: (1) The City has reduced unaccounted system losses by 8 percent over the past 10 years (from 25% to 17%). The city will continue to reduce system loss by refining and monitoring the meter replacement program.

(2) The City is developing a leak detection plan. The goals of this plan are to use leak detection equipment to survey one fifth of the system per year. The leak detection program will start by focusing on areas along 800 East and 800 West where potential hot soils have been located.

(3) The City will continue to enforce and monitor hydrant usage.

(4) The City will continue to monitor for illegal connections/cross connections. North Logan City staff members have received training in these areas.

Measurement: The City will measure the total savings by comparing the total water production against the total water usage (water that is sold to the customers). The amount of water that is conserved will be measured through user meters.

Water Rates

Problem: North Logan City currently has a high overage rate that provides incentive for water conservation. Restructuring of the water rate is required to motivate all customers to conserve.

Goal: Within five years the City will have a tiered water rate schedule. This rate will cover the system's operating and maintenance costs in the base rate (including debt service). The City has begun talks regarding the tiered water system. The tiered water system would incentivize water users to conserve water by implementing increased water rates for users that exceed specific water use thresholds (tiers).

Actions: The City is currently developing a tiered water rate system. This would penalize customers that use large quantities of water and encourage conservation. This would also help to build-up a reserve account for future system upgrades.

3.0 CURRENT CONSERVATION PLANS

The current conservation plans that have been implemented by North Logan City have been successful. In North Logan's 2013 Water Conservation Report, the water usage was estimated to be 171 gpcd. The current (2017) water usage has decreased by 12% to 150 gpcd.

3.1 Secondary Water System

North Logan's secondary water system is the most significant culinary water conservation measure that has been implemented in the City. This conserves culinary water that would otherwise be used to irrigate lawns and gardens. Approximately 50 percent of North Logan residents have access to secondary

water. Additionally, the city offices, fire station, park, and library use secondary water for irrigation needs. As land is developed, new subdivisions typically connect to the secondary water system if the area has access to water shares. Secondary water is not available above the Cache Highline Canal (previously known as the “The Upper Canal” of the Logan, Hyde Park, Smithfield Canal Company).

3.2 Water Conservation Ordinances

North Logan City has developed an ordinance that requires new subdivisions to develop a water conservation plan (Ordinances 12D-614(B)(4) and 12D-115(B)(4) see Appendix A). The water conservation plan will need to have an assessment of the potential outside culinary water use for the subdivision and recommendations for lot size, landscaping, and irrigation practices to minimize culinary water use. If the land has irrigation water rights, the water conservation plan should contain an assessment and recommendations for developing a secondary water irrigation system.

North Logan City has also developed an ordinance (12D-115(B)(4)) that requires a vegetation plan for all non-buildable or common spaces within a subdivision. This plan will need to include xeriscaping and water management requirements for areas that are not serviced by the secondary water system to conserve the culinary water.

3.3 Watering Restrictions and Water Conservation Contingency Plan

During the summer months, North Logan has encouraged residents to avoid watering lawns and gardens during daylight hours. North Logan has also encouraged residents to stagger their watering days, with some residents watering on even-numbered days and others on odd-numbered days. This information is distributed through a notice in the City newsletter.

North Logan City has developed a Water Conservation Contingency Plan. The plan outlines four phases of water shortage and the necessary water conservation measures. See Appendix B for the Water Conservation Contingency Plan.

3.4 Public Education

North Logan publishes educational notices relating to water conservation in the City newsletter and on the City website. Occasionally, North Logan will distribute water conservation information with the water bill.

3.5 Water Conservation Committee

A Water Conservation Committee has been organized. They meet semi-annually. The committee is responsible for overseeing the implementation of the Water

Conservation Plan. The committee will also oversee the update and re-submittal of the plan as required by the Division of Water Resources.

The current committee members are:

Damon Cann, Pro Tem Mayor
2076 N 1200 E
North Logan, UT 84341
damon@northlogancity.org

Jordan Oldham, Public Works Director
2076 N 1200 E
North Logan, UT 84341
(435) 752-1310 ext. 16
jordan@northlogancity.org

Alan Luce, City Administrator
2076 N 1200 E
North Logan, UT 84341
(435) 752-1310 ext. 14
alan@northlogancity.org

Zachary Root
2076 N 1200 E
North Logan, UT 84341
zac@northlogancity.org

Roger Anderson, City Council
roger@northlogancity.org

Lance Anderson, City Engineer
95 Golf Course Rd #101
Logan, UT 84321
(435) 713-0099
lance@cachelandmark.com

4.0 CURRENT PRICING STRUCTURE

North Logan City is currently reviewing a tiered water pricing structure.

Currently, North Logan City charges \$1.57 for each 1,000 gallons of water in addition to a monthly user fee that is shown in Table 9.

Table 9. Current Water Rates

Meter Size	Monthly Flat User Fee
¾" or 1"	\$7.11
1.5"	\$10.34
2"	\$14.22
3"	\$29.09
4"	\$54.29
6"	\$135.74

5.0 ADDITIONAL CONSERVATION PRACTICES

By the year 2050, the projected water demand for North Logan City is 150 gpcd, which is equivalent to 3,114 AF/year. North Logan City will implement water conservation measures to decrease the projected water demand by 15% to 128 gpcd or 2,647 AF/year. The following water conservation measures have been and/or will be implemented:

- Public information program regarding conservation methods and practices.
- Conservation Ordinances - require the usage of water wise landscaping and secondary water.
- Tier the water pricing structure to incentivize customers to conserve culinary water.
- Metering improvements related to upgrades and updates to water meters.
- Water System Audits – replacement plan for older portions of the City’s water distribution piping, pumps, boosters, and meters.
- Plumbing Standards – encourage older residential subdivisions to update plumbing fixtures to more efficient models, and enforce new water conservation building codes designed to reduce overall usage.
- Conservation Programs for Institutional, Industrial, and Commercial Customers – discuss conservation practices for these land uses.
- Water Conservation Coordinator – work with the Utilities Department to emphasize conservation measures. Assign duties and responsibilities to the entire Public Works Department related to metering, auditing, monitoring, developmental conservation practices, and public information.

6.0 IMPLEMENTING & UPDATING THE WATER CONSERVATION PLAN

The Water Conservation Committee is responsible for overseeing and updating the implementation of the Water Conservation Plan. Jordan Oldham is the Water Conservation Coordinator.

Jordan Oldham, Public Works Director
 2076 N 1200 E, North Logan, UT 84341
 (435) 752-1310 ext. 16
jordan@northlogancity.org

References

Governor's Office of Planning and Budget, 2012. Sub-county Population Projection.
<https://gomb.utah.gov/budget-policy/utahseconomy/>

North Logan City Water Conservation Plan-2013, 2013.

Utah Division of Water Resources Conservation Program.
<https://conservewater.utah.gov/wcp.html>

Utah Division of Water Rights. Public Water Supplier Information, North Logan City Culinary System. https://waterrights.utah.gov/cgi-bin/wuseview.exe?Modinfo=Pwsview&SYSTEM_ID=12671267

Appendix A
North Logan City Water Conservation Ordinances

Appendix B
Water Conservation Contingency Plan