CITY OF LAGO, VISTA, TEXAS

ORDINANCE NO. 18-01-18-01

AN ORDINANCE OF THE CITY OF LAGO VISTA, TEXAS, CREATING THE WATER CONSERVATION PLAN FOR THE CITY OF LAGO VISTA; PROVIDING FOR CONFLICTING ORDINANCES, SEVERABILITY, AND OPEN MEETINGS; AND PROVIDING FOR RELATED MATTERS

WHEREAS, LCRA rules require a municipality/wholesale water supplier with meter connections equal to or greater than 3400 to have a water conservation plans (WCP);

WHEREAS, the City of Lago Vista has determined that it has over 3400 meter connections and therefore must create and approve its own WCPs for the City; and

WHEREAS, the City Council also desires to provide an opportunity for public input for the WCP by holding a public hearing which has been noticed to such public for a period of not less than seventy-two hours prior to the public meeting at which it will be held.

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS THAT:

Section 1. Findings. The above and foregoing recitals are hereby found to be true and correct and are incorporated herein as findings of fact.

Section 2. Adoption of Water Conservation Plan. The City Council hereby adopts a Municipal Water Conservation Plan for the City of Lago Vista, attached hereto as Exhibit "A" and incorporated in this ordinance as though fully transcribed herein for all purposes.

Section 3. Amendment of Conflicting Ordinances. All ordinances or parts thereof conflicting or inconsistent with the provisions of this ordinance as adopted and amended herein, are hereby amended to the extent of such conflict. In the event of a conflict or inconsistency between this ordinance and any other code or ordinance of the City, the terms and provisions of this ordinance shall govern.

Section 4. Severability. If any section, subsection, sentence or phrase of this Ordinance is for any reason held to be unconstitutional, void or invalid, the validity of the remaining portions of this Ordinance shall not be affected. It is the intent of the city council in adopting this Ordinance, that no provision or regulation contained herein shall become inoperative, or fail by reason of the unconstitutionality or invalidity of any other section, subsection, sentence or phrase of this Ordinance.

Section 5. Effective Date. This ordinance shall take effect immediately from and after its passage and publication in accordance with the provisions of Chapter 52 of the Texas Local Government Code and the City Charter.

Section 6. Open Meetings. It is hereby officially found and determined that the meeting at which this ordinance is passed was open to the public as required and that public notice of the time, place, and purpose of said meeting was given as required by the Open Meetings Act, Chapter 551 of the Texas Government Code.

Water Conservation Plan

For

The City of Lago Vista Municipal Purchased Water Customers

Prepared by

Dave Stewart
Assistant Director of Public Works

January 18, 2018

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Definitions:

AF: an **A**cre-**F**oot is a unit of volume equal to the volume of a sheet of water one acre (0.405 hectare) in area and one foot (30.48 cm) in depth; 43,560 cubic feet (1233.5 cu m).

AMR: **A**utomatic **M**eter **R**eading is radio frequency based collection system for collecting water consumption data and transferring it to a central data base system for billing.

Automatic Irrigation: the operation of an irrigation system with no or minimum of manual intervention besides surveillance. This includes drip, sprinkler, and surface irrigation systems that utilize timers, sensors, computers, or mechanical devices.

CoLV: the **C**ity **o**f **L**ago **V**ista is a city located in Northwest Travis County, Texas, United States.

Commercial Use: The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial or institutional users.

Connections: a water meter used to provide service to an end user.

Conservation: those practices, techniques, and technologies that reduce the consumption of purchased water, reduce the loss of purchased water, improve the efficiency in the use of purchased water, or increase the recycling and reuse of purchased water so that the water supply is conserved and made available for future or alternative uses.

Customer: any CoLV resident, person, company, or organization using purchased water supplied by the CoLV.

DCP: a **D**rought **C**ontingency **P**lan is a strategy or combination of strategies for monitoring the progression of a drought and preparing a response to potential water supply shortages resulting from severe droughts or other water supply emergencies.

Drip Irrigation: is a form of irrigation that saves water and fertilizer by allowing water to drip slowly to the roots of many different plants onto the soil surface thru a network of valves, tubes, pipes, and emitters.

End User: any CoLV resident, person, company, or organization using purchased water supplied by the CoLV.

EST: an **E**levated **S**torage **T**ank is a container raised above ground elevation that holds potable water for long or short term storage. An EST may also be a GST that serves end users at least 100' below the elevation of the floor of the GST.

Finished Water Meter: a meter used to measure the flow of water from a water treatment plant after it has been treated.

GPCD: **G**allons **P**er **C**apita per **D**ay is the daily average of raw water purchased in a month divided by the annual CoLV population for the year displayed.

GST: a **G**round **S**torage **T**ank is ground level container that holds potable water for long or short term storage.

Institutional Use: The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.

LCRA: the **L**ower **C**olorado **R**iver **A**uthority is a nonprofit public utility created in November 1934 by the Texas Legislature. LCRA's mission is to enhance the lives of the Texans it serves through water stewardship, energy and community service.

MGD: **M**illion **G**allons per **D**ay.

Pressure Plane: an isolated portion of the water distribution system supplied by a particular EST or GST.

Process Water Meter: a meter used to measure the potable water used in plant operations at water and wastewater treatment plants.

Purchased Water: raw water or potable water purchased from the CoLV.

Raw Water Meter: a meter used to measure the raw water purchased from LCRA used in plant operations at water and wastewater treatment plants.

Residential Use: The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor water uses.

Reuse Water: reclaimed water such as graywater, effluent from a wastewater treatment plant, or flushing water from a water distribution system.

RGPCD: **R**esidential **G**allons **P**er **C**apita per **D**ay is the daily average of the total residential water sold in a month divided by the annual CoLV population for the year displayed.

TAWWA: **T**exas **A**merican **W**ater **W**orks is a group that unites all Water Professionals in Texas to protect public health and all water resources by advancing technology, education, science, management and government policies by leveraging the collective leadership of the over 50,000 members of the American Water Works Association.

TCEQ: the Texas Commission for Environmental Quality is the environmental agency for the state of Texas and the fourth largest environmental agency in the United States. TCEQ strives to protect Texas' public health and natural resources consistent with sustainable economic development.

TTHM: **T**otal **Trihalo**methanes are a cancer causing byproduct produced when chlorine is used to disinfect potable water containing organics.

TWDB: the **T**exas **W**ater **D**evelopment **B**oard is the state agency in charge water conservation and long range water planning for Texas.

WCP: Water **C**onservation **P**lan is the CoLV plan that was developed to meet the Lower Colorado River Authority (LCRA) water conservation rules in accordance with the LCRA Firm Water contract administrative rules.

Water Customer: any CoLV resident, person, company, or organization using purchased water supplied by the CoLV.

WCAC: the Texas **W**ater **C**onservation **A**dvisory **C**ouncil provides a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas. The WCAC also selects the Blue Legacy award recipients annually.

WWTP: a **W**astewater **T**reatment **P**lant is a facility that converts wastewater, which is water no longer needed or suitable for its most recent use, into an effluent that can be either returned to the water cycle with minimal environmental issues or reused.

Water Service Area: the area served by the CoLV's water plants.

WTP1: **W**ater **T**reatment **P**lant **#1** is located at 21011 Seminole Drive, Lago Vista Texas 78645, was built in 1984, and consists two 1.0 MGD Enviroquip upflow clariers. WTP1 was last upgraded in 2017.

WTP2: **W**ater **T**reatment **P**lant **#2** is located at 21011 1/2 Dawn Drive, Lago Vista Texas 78645, was built in 1970, and consists two 0.5 MGD Roberts Package Plants. WTP2 was decommissioned in April 2017.

WTP3: **W**ater **T**reatment **P**lant **#3** is located at 6444 Marshall's Point Cove, Lago Vista Texas 78645, was built in 2015, and consists a 2.0 MGD Trident Package Plant. WTP3 can be expanded to 8.0 MGD and has the deepest water intake on Lake Travis.

Wholesale Purchased Water Customer: an entity that purchases bulk water for construction purposes or resale to agricultural, residential, commercial, industrial, or governmental end users.

Section 1: Introduction

The City of Lago Vista (CoLV) Municipal (Purchased) Water Conservation Plan (WCP) has been developed to meet the Lower Colorado River Authority (LCRA) water conservation rules in accordance with the LCRA Firm Water contract administrative rules. This Municipal WCP recognizes that purchased water conservation is a valuable tool in managing water utility systems. Benefits of purchased water conservation include: extending available water supplies; reducing the risk of shortage during periods of extreme drought; reducing water utility operating cost; improving the reliability and quality of water utility service; reducing customer cost for water service; and enhancing water quality and the environment.

All LCRA firm water users are required to develop and formally adopt WCPs for their own systems in accordance with Title 30 Texas Administrative Code (TAC) Sections 288, Subchapter A, Water Conservation Plans, and Subchapter C, Required Submittals. Furthermore, being located within the regional water planning area of Region K, a copy of the WCP has been provided to the Region K Water Planning Group.

This Municipal WCP applies to all of CoLV's retail water customers located with its water service area, as defined in its Water Supply Contract with LCRA. Because the CoLV has a zero discharge permit for its Wastewater Treatment Plant (WWTP), the CoLV Municipal WCP does not apply to reuse water purchased by any CoLV water customer.

Section 2: Utility Profile Information

As of October 2017, there were approximately 3,642 connections in the CoLV's water service area. Based on the 2015 Texas State Data Center calculations, there are 1.9 persons per household in this service area, so the September 2017 estimated population is 7,065. The projected population at full build out is estimated to be approximately 40,000 persons, or 17,334 additional connections. The population is expected to grow at 5.4% per year until 2022 and when the growth rate increases to 8.0% per year with full build out projected in 2040.

Table 1 in Appendix A provides information on monthly purchased water use data for the past five years. The 5 year average monthly purchased water use was 118.388 AF. The five year average purchased water loss was 12%. The five year peak for monthly purchased water use was 157.505 AF.

Table 2 in Appendix A shows residential water use for the past five years as 88.731 total residential gallons per capita per day (RGPCD) and 188.555 purchased water gallons per capita per day (GPCD).

Section 3: Water Conservation Goals

Water conservation five and ten year goals are required for overall water use, residential water use and water loss. The goals proposed by the CoLV are as follows:

	5-year goals	10-year goals
Gallons per person per day (GPCD)	182.899	179.127
Residential gallons per person per day (RGPCD)	86.513	84.295
Water loss	10%	8%

Section 4: Water Conservation Strategies

4.1 Water Loss

4.1.1 Universal Metering, Meter Replacement, and Meter Repair

The CoLV requires that the following end users be metered:

- All municipal utility purchased water customers must be metered.
- All municipal irrigation purchased water customers must be metered.
- All wholesale purchased water customers must be metered.
- All construction projects both private and public using purchased water must be metered.
- All purchased water bulk water sales from a fire hydrant must be metered.
- All CoLV buildings and facilities using purchased water must be metered.
- All irrigation for CoLV medians and parks using purchased water must be metered.
- All CoLV water treatment plants must have the following water meters:
    - raw water meters
    - process water meters
    - finished water meters.
- All CoLV booster pump stations must be metered.
- All CoLV water distribution flushing must be metered.
- All CoLV wastewater treatment plants using purchased water must be metered.
- All CoLV lift stations using purchased water must be metered.

The CoLV requires all water meters to be accurate within plus or minus 5 percent of the indicated flow over the possible flow range.

A regularly scheduled maintenance program of meter repair, replacement and calibration will be performed in accordance with recommended meter manufacturer guidelines following the minimum schedule by meter size:

- Finished water meters: test once a year.
- Master water meters: test once a year.
- Water meters larger than 1": test per manufacturer's recommendations.

- Water meters 1" or smaller: test per manufacturer's recommendations.
- Automatic Meter Reading (AMR) registers and brass meter bodies will be replaced system wide every 7 to 10 years.

Zero consumption accounts will be checked monthly to see if water is actually being used and not recorded. In addition, the meters will be checked for proper sizing for all new installations and during reconnections. The CoLV plans to continue to change out its AMR water meters every 7 to 10 years. The last CoLV water service area meter replacement program was completed in 2013.

4.1.2 Distribution System Leak Detection and Repair

In order to meet the CoLV's purchased water loss goal and in accordance with Texas Water Development Board (TWDB) rules, the CoLV will:

- repair all purchased water leaks in a timely fashion.
- conduct purchased water distribution leak detection audits as needed.
- monitor current purchased water loss through monthly water production and usage reports.
- conduct and submit yearly purchased water loss audits to the TWDB.

New measures and strategies to proactively reduce purchased water loss will be considered as feasible, including measures to reduce water lost within the water treatment process, line flushing and identifying/repairing waterline leaks quickly.

4.1.3 Additional Water Loss Best Management Practices

The CoLV currently utilizes the following water loss best management practices:

- AMR water meters and computer based water auditing software. The AMR software alerts the CoLV utility billing staff to end users with slow leaks, high usages, defective irrigation systems or any combination of these situations.
- The CoLV has abandoned the use of the leaky legacy PVC and ductile iron piping systems, becoming the second City in the US to adopt the sole use of the leak free fused HDPE pipe for all future distribution piping that will be installed in its water, wastewater, and reuse water distribution systems. Currently, 30% of the water distribution system, 65% of the wastewater force main system, and 41% of the reuse water transmission lines are leak free fused HDPE pipe.
- CoLV strategies to minimize distribution flushing water losses that include the following:
    - Looping dead end waterlines within a pressure plane.
    - Looping dead end waterlines between pressure planes.
    - Developing an innovative tank mixing process for ground storage tanks that eliminated the need to flush the Ground Storage Tank (GST) because of high Trihalomethanes levels.

- Chlorine injection stations have been placed strategically throughout the water distribution system in order to avoid the need for excessive flushing in order to keep chlorine residuals in compliance with Texas Commission for Environmental Quality (TCEQ) regulations.
- A proactive leak detection program is being used to decrease water loss in the water distribution system.
- At Water Treatment Plant #1 (WTP1), backwash water and sludge blanket draw down water is sent to the WWTP where it is processed into reuse water.
- Water Treatment Plant #2 (WTP2) was decommissioned in April 2017.
- At Water Treatment Plant #3 (WTP3), backwash water is decanted and mixed with the raw water inflow to the water plant.
- Reuse water from the WWTP is used to irrigate the Lago Vista Golf Course (LVGC) and Highland Lakes Golf Course (HLGC). The Grille at Highland Lakes uses reuse water to irrigate its 2 acres of grass surrounding the restaurant.
- The CoLV is planning to start irrigating local ball fields with reuse water instead of purchased water as the supply of reuse water increases and becomes available.

The CoLV received three water conservation awards for water loss best management practices in 2017:

- The Water Conservation Advisory Council's (WCAC) 2017 Blue Legacy Award for Municipal Water Suppliers Retail Water Supplier ~ [Population < 10,000] System Water Loss Reduction under "Other" Program
- The Texas Water Development Board's (TWDB) 2017 Innovative Water Supply Award (Conservation Category) for Ground Storage Tank Mixing/ TTHM Removal Project
- The Texas American Water Works Association's (TAWWA) 2017 Texas Water Conservation & Reuse Award Small Utility Direct ~ [Population < 50,000]

The CoLV is considering a multi-year City-wide Water Distribution Pipe Replacement Strategy to upgrade to HDPE pipe as our future "standard pipe type" as displayed in Appendix C. Implementation details have not been developed as of this plan approval. By migrating to one standard HDPE pipe type that has 100 year life, CoLV expects savings in the following areas:

- Water loss per mile of distribution system pipe will be reduced as the legacy Galvanized, Ductile iron, PVC class pipe, PVC C900 pipe and AC pipe are replaced with leak free HDPE pipe.
- The elimination of the 5 legacy piping systems will result
    - in a standardized piping system that is easier and faster to fix with less water losses.
    - the elimination of a large legacy pipe repair parts inventory and tooling that can be difficult to work with during emergency repairs.
    - the elimination of future training hours for repairing legacy piping systems.

PVC class pipe will be scheduled for replacement first followed by galvanized pipe and ductile iron pipe types. The CoLV will be monitoring each legacy piping system to identify when that

particular legacy piping system start failing at a rate of one leak per mile per year, necessitating replacement per AWWA standards.

4.2 Water Rates and Records Management

4.2.1 Increasing Purchased Water Block Rates

The CoLV uses a base rate structure that promotes purchased water conservation with an increasing multi-tiered rate structure for residential, commercial, and irrigation purchased water end users. The CoLV reevaluates its rate structure periodically in order to promote purchased water conservation to the maximum extent possible. Future CoLV updated rates structures shall be submitted to LCRA within 30 days of adoption. The current rate structure can be found in Appendix B and is located on the CoLV utility web site.

4.2.2 Purchased Water Consumption Monitoring and Billing Records Management

The CoLV's utility billing staff maintains monthly records of purchased water sales, consumption reports, and utility bills on a central server that can be used to compile, present, and view purchased water-use and billing information.

The billing system is capable of separating water-use per customer type into the following categories: residential, irrigation, and commercial. Any new billing system purchased by the CoLV will be capable of reporting detailed water use data by single-family residential, multi-family residential, irrigation, commercial, industrial, institutional, agricultural and wholesale.

4.3 Water Reuse

The CoLV operates a 1.0 Million Gallon per Day (MGD) WWTP. Reuse water from the WWTP is used to supplement the irrigation supply needs of the following properties:

- 85 irrigated acres of the Highland Lakes Golf Course
- 113 irrigated acres of the Lago Vista Golf Course
- 2 irrigated acres of the Grille at Highland Lakes
- 67 irrigated acres of bird habitat at the Cedar Breaks Effluent Disposal Site

The treated wastewater effluent currently produces an average 0.412 MGD per day and 100% of that effluent is utilized for the beneficial irrigation uses listed above.

4.3.1 Additional Water Reuse Best Management Practices

The CoLV is planning to start irrigating local ball fields with reuse water instead of purchased water as the municipal supply of reuse water increases and becomes available.

4.4 Education and Outreach

4.4.1 Required measures

Throughout the year, purchased water conservation literature will be made available to end users regarding purchased water conservation, native landscaping, and other related topics to garden clubs, homeowner associations, and various others interested groups. CoLV staff may attend such events or request a presentation from LCRA staff to promote purchased water conservation.

4.4.2 Additional Best Management Practices

- Financial rebates: Customers will be offered irrigation technology and other rebates from the LCRA. CoLV will assist LCRA with promoting water conservation programs to its customers.
- Hotels currently being proposed will be strongly encouraged to adopt a hotel linen reuse option policy where linens are only changed out upon request during multi-night short stays.

4.5 Other Best Management

- Permanent landscape watering schedule for spray irrigation. This schedule limits outdoor spray irrigation for landscapes to no more than twice a week on the following days and times:
    - Residential addresses ending in odd numbers: Wednesdays and Saturdays
    - Residential addresses ending with even numbers: Thursdays and Sundays
    - Commercial customers: Tuesdays and Fridays
    - Watering times: Midnight to 10 a.m. and 7 p.m. to midnight
- Temporary landscape watering schedule variance for new landscapes. New landscapes can be watered according to the following schedule for the first 30 days after installation.
    - Days 1 through 21: spray irrigation allowed every day.
    - New variance application is required to continue temporary irrigation.
    - Days 22 through 42: spray irrigation allowed every other day.
    - No further variances allowed.
    - Watering times: Midnight to 10 a.m. and 7 p.m. to midnight.
- Landscape Conservation Requirements for new development: the CoLV shall incorporate Appendix D of this plan into its adopted rules and regulations.
- Swimming Pool Construction Requirements for new pools: the CoLV shall incorporate Appendix E of this plan into its adopted rules and regulations.

Section 5: Wholesale Water Conservation Plans

Wholesale treated water customers must develop a Drought Contingency Plan (DCP) and a Water Conservation Plan (WCP) in accordance with LCRA Water Contract Rules. The plans must include a governing board resolution, ordinance, or other official document noting that the plans have been formally adopted by the wholesale purchased water customers.

Wholesale purchased water customers must include in their wholesale water supply contracts the requirement that each successive wholesale purchased water customer must develop, implement, and regularly update their DCP and WCP, subject to CoLV and LCRA approval, and consistent with Title 30 Texas Administrative Code (TAC) Sections 288, Subchapter A, Water Conservation Plans, and Subchapter C, Required Submittals.

Section 6: Coordination with Regional Water Planning Group

The water service area of the CoLV is located within the Lower Colorado River Water Planning Area (Region K) of the State of Texas and the CoLV has provided or will provide a copy of this water conservation plan to the regional water planning group. The plan can be sent to the LCRA, c/o Water Contracts and Conservation, P.O. Box 220, Austin, Texas 78703.

Section 7: Authorization and Implementation

The City Manager of CoLV, or his/her designee, is hereby authorized and directed to implement the applicable provisions of this Municipal WCP. The City Manager, or his/her designee, will act as Administrator of the Water Conservation Program. He/she will oversee the execution and implementation of the program and will be responsible for keeping adequate records for program verification. A signed and dated copy of this plan by the City Manager or his/her designee will be sufficient to meet this requirement.

7.1 Municipal WCP Implementation

The CoLV has designated a water conservation coordinator, who will be responsible for the implementation of this water conservation plan. The current water conservation coordinator is the CoLV Director of Public Works. The City Manager, or his/her designee, may re-appoint this position. At that time, the CoLV will inform LCRA about this personnel change.

Approved and Accepted by the CoLV Authorized Representative:

Approved and Accepted:

_____

Ed Tidwell, Mayor

_____

Date

Appendix A: Historical Purchased Water / Reuse Water Use Data

Table 1: Monthly Purchased Water Use (AF)

	2013		2014		2015		2016		2017			
Month	**Purchased AF**	**Reuse AF**	**Purchased AF**	**Reuse AF**	**Purchased AF**	**Reuse AF**	**Purchased AF**	**Reuse AF**	**Purchased AF**	**Reuse AF***	**Average Purchased**	**Maximum Purchased**
January	108.832	5.186	95.053	2.190	105.294	1.848	96.142	11.214	94.632	3.083	99.991	108.832
February	107.083	6.229	95.433	2.547	103.937	3.125	105.361	9.641	88.831	2.617	100.129	107.083
March	100.215	8.351	87.559	6.666	79.905	2.475	97.775	10.111	94.632	3.148	92.017	100.215
April	115.387	7.823	93.792	9.034	100.419	6.331	99.662	9.387	106.895	5.089	103.231	115.387
May	105.926	7.752	107.850	8.337	109.627	2.791	111.526	8.249	137.597	10.443	114.505	137.597
June	106.859	9.956	141.853	10.882	96.486	7.990	102.556	18.296	123.574	10.546	114.266	141.853
July	149.357	9.853	125.996	10.221	106.582	12.031	174.349	24.443	123.553	18.869	135.967	174.349
August	147.966	7.280	156.869	7.240	176.841	14.899	171.087	17.717	134.761	12.075	157.505	176.841
September	137.121	9.583	152.389	8.249	166.764	14.096	172.554	16.739	128.032	11.602	151.372	172.554
October	92.272	6.091	132.425	9.423	150.492	13.303	129.126	14.873	130.186	0.471	127.035	150.492
November	116.405	5.579	111.438	4.037	122.276	9.381	117.459	6.395	130.859	7.669	119.627	130.859
December	109.872	1.961	96.259	2.249	89.240	11.376	117.115	3.940	112.594	0.908	105.016	117.115
Total	**1396.995**	**85.644**	**1396.916**	**81.075**	**1407.863**	**99.646**	**1494.712**	**151.005**	**1406.821**	**86.521**		

*Effective October 1, 2017, the Highland Lakes Golf Course which was the primary end user of reuse water closed.

Table 2: Monthly Purchased Water Use (GPCD)

	2013		2014		2015		2016		2017	
Month	**Residential GPCD Pop 6,369**	**Purchased Water GPCD Pop 6,369**	**Residential GPCD Pop 6,478**	**Purchased Water GPCD Pop 6,478**	**Residential GPCD Pop 6,674**	**Purchased Water GPCD Pop 6,674**	**Residential GPCD Pop 6,869**	**Purchased Water GPCD Pop 6,869**	**Residential GPCD Pop 7,065**	**Purchased Water GPCD Pop 7,065**
January	77.88	179.615	60.34	149.616	69.34	165.834	59.09	147.122	64.15	140.794
February	72.64	195.664	67.21	166.308	62.62	181.236	63.22	178.504	67.16	146.323
March	68.71	165.394	59.48	137.820	56.35	125.848	67.09	149.621	54.29	140.793
April	104.29	196.781	86.42	152.552	74.09	163.428	78.89	157.592	68.25	164.340
May	88.15	174.819	77.24	169.758	64.54	172.659	65.47	170.663	68.05	204.717
June	88.44	182.237	106.48	230.722	68.79	157.028	69.97	162.168	97.84	189.982
July	144.97	246.497	98.99	198.321	97.48	167.863	112.78	266.798	90.76	183.822
August	107.31	244.201	106.28	246.915	124.45	178.519	106.89	261.807	124.95	200.498
September	146.10	233.846	98.99	247.859	185.08	271.403	130.66	272.853	101.90	196.836
October	86.65	152.285	86.01	208.440	115.76	237.020	97.83	197.596	89.78	194.695
November	68.46	198.006	83.73	181.253	91.82	199.000	95.86	185.734	100.85	201.182
December	75.66	181.331	63.58	151.514	71.77	140.550	69.37	179.216	67.88	167.518
Average GPCD	94.27	195.890	86.82	186.756	90.17	188.366	84.76	194.139	82.97	177.625

Pop = Population Con = Connections

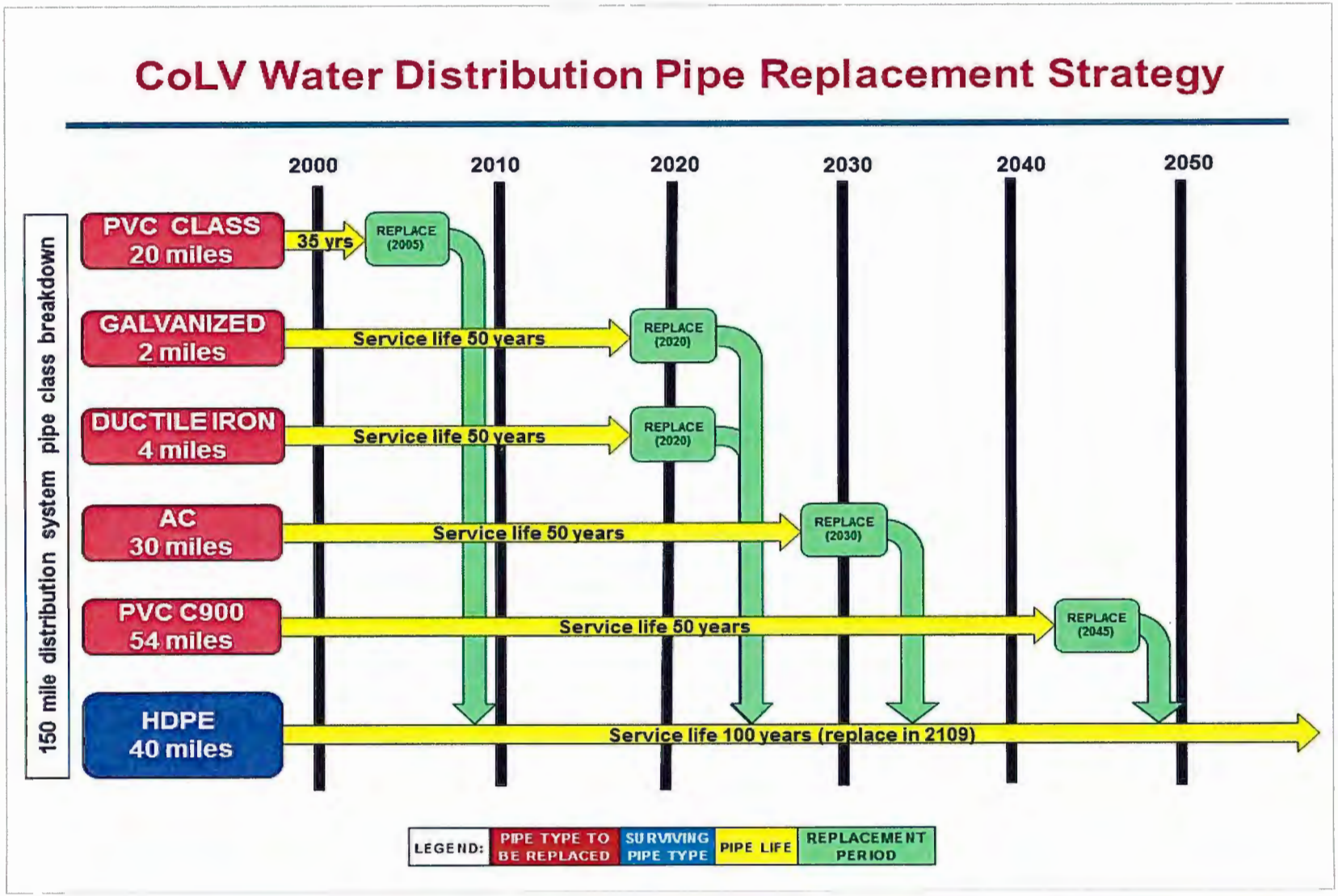
Appendix B - 2017-18 CoLV Rate Structure

Water Rates Residential	
Base	Base $36.52
0 - 2,000	Included in Base Rate
2,001 - 5,000	$5.04 per 1,000 gallons
5,001 - 10,000	$6.29 per 1,000 gallons
10,001 - 15,000	$8.29 per 1,000 gallons
15,001 - 25,000	$10.79 per 1,000 gallons
25,001 - 50,000	$13.79 per 1,000 gallons
50,001 -and above	$17.29 per 1,000 gallons

Water Rates Commercial	
Base	Base $36.52
0 - 2,000	$3.95 per 1,000 gallons
2,001 - 5,000	$4.95 per 1,000 gallons
5,001 - 10,000	$6.20 per 1,000 gallons
10,001 - 15,000	$8.20 per 1,000 gallons
15,001 - 25,000	$10.70 per 1,000 gallons
25,001 - 50,000	$13.70 per 1,000 gallons
50,001 -and above	$17.20 per 1,000 gallons

Water Rates Irrigation	
Base	Base $36.52
0 - 2,000	$4.65 per 1,000 gallons
2,001 - 5,000	$5.65 per 1,000 gallons
5,001 - 10,000	$6.90 per 1,000 gallons
10,001 - 15,000	$8.90 per 1,000 gallons
15,001 - 25,000	$11.40 per 1,000 gallons
25,001 - 50,000	$14.40 per 1,000 gallons
50,001 -and above	$17.90 per 1,000 gallons

Water Rates Industrial	
Base	Base $36.52
Flat rate per 1000	$4.17 per 1,000 gallons


CoLV Water Distribution Pipe Replacement Strategy
2000
2010
2020
2030
2040
2050
150 mile distribution system pipe class breakdown
PVC CLASS
20 miles
35 yrs
REPLACE
(2005)
GALVANIZED
2 miles
Service life 50 years
REPLACE
(2020)
DUCTILE IRON
4 miles
Service life 50 years
REPLACE
(2020)
AC
30 miles
Service life 50 years
REPLACE
(2030)
PVC C900
54 miles
Service life 50 years
REPLACE
(2045)
HDPE
40 miles
Service life 100 years (replace in 2109)
LEGEND:
PIPE TYPE TO BE REPLACED
SURVIVING PIPE TYPE
PIPE LIFE
REPLACEMENT PERIOD

Appendix D - Landscape Conservation Requirements

General

The Landscape Conservation Guidelines are modeled after the "Sensible Landscaping for Central Texas" guidebook for home builders and homeowners adopted by the Homebuilders Association of Greater Austin (http://www.hbaaustin.com) and are intended to provide builders and homeowners with a well-designed, water-efficient landscape.

Design

A. Turf shall not be planted on more than 50 percent, or up to 7,000 square feet, of the landscape. Longer leafed native grasses, low water consumption grasses that use low amounts of water are not considered turf grass in this context such as:
    a. Bermuda grass
    b. Zoysia grass
    c. Buffalo grass

    Wildflowers may also be used as a ground cover.
B. Automatic spray irrigation for each home or business shall be limited to 2.5 times the foundation footprint, with a 12,000 square foot maximum. The footprint may include both the house and the garage, but not the driveway or patio.

Soil

A. There shall be no less than 3" inches of high quality topsoil in planted areas for sodded lawns and 4" for hydro-mulched areas. The CoLV recommends that 6" inches of high quality topsoil in planted areas for sodded lawns and hydro-mulched areas as the additional depth of soil will make the lawns much more drought resistant.
B. Topsoil shall be native soil from the site, or non-native topsoil that contains no less than 25 percent organic matter (compost) blended through the soil. Topsoil shall not be of any admixture of subsoil or slag and shall be free of stones more than 1.5 inches in diameter, lumps, refuse, plants or their roots, sticks, noxious weeds, salts, soil sterilants or other material detrimental to plant growth. Delivered topsoil should be obtained from a well-drained site that is free of flooding.
C. Topsoil added to the site should be incorporated into existing surface in a 2-inch to 3-inch scarified transition layer to enable water to drain adequately through the different types of soil. Areas within the drip line of existing trees that will be retained should not be scarified as it may damage the trees.

Irrigation

A. The CoLV does not require automated irrigation systems for new landscaping. However, if an automatic irrigation system is installed, it shall be required to meet the guidelines outlined in this section.
B. All irrigation systems shall be installed in accordance with state law, Title 2 Texas Water Code, Chapter 34 and Title 30 Texas Administrative Code, Chapter 344 rules, as

regulated and enforced by the Texas Commission on Environmental Quality (TCEQ). Irrigation contractors who install the irrigation systems must be TCEQ Licensed Irrigators.

C. Drip irrigation shall be used for all irrigated landscaped areas, excluding turf. Turf may be irrigated with drip, but it is not required.
D. Areas planted with turf shall be in separate zones from areas planted with shrubs, trees or perennials.
E. Hydrozoning of automatically irrigated areas shall be scheduled with plants with similar watering needs.
F. All automatic irrigation systems are required to have a rain sensor, and a soil moisture sensor or a weather sensor connected to an irrigation controller in order to stop the irrigation cycle during and after a rainfall event. Rain sensors are to be installed in a location where rainfall is unobstructed and should be adjusted to the 1/4-inch setting.
G. Sprinkler irrigation is prohibited in median strips, parking islands and all landscape areas less than 10 feet from curb to curb or 10 feet in width. Areas less than 10 feet curb-to-curb or 10 feet in width can be irrigated with subsurface drip irrigation or drip irrigation low volume irrigation in order to avoid runoff and overspray onto the hardscape.
H. All new residential irrigation systems are required to have pressure regulation where the static operating pressure exceeds the sprinkler manufacturer's recommended operating range in order to eliminate extensive misting. These may include in-line pressure regulators, flow control valves or sprinkler devices equipped with pressure regulation stems or nozzles. Irrigation systems must have a controller that features multiple start times, rain sensor capability, a water budget feature and a non-volatile memory in case of power outage.
I. Scheduling recommendations shall be posted inside or close to the controller enclosure box for easy reference.
J. Homeowners shall be provided with a complete irrigation plan (or as-built drawing) that describes the location of each irrigation zone, control valves and sprinkler devices.
K. Sprinkler systems shall be designed with no overspray onto the hardscape.
L. Sprinkler zones located at the bottom of sloped terrain along curbs, sidewalks, driveways and other hardscapes should be equipped with devices such as in-line check valves and sprinkler heads with check valves that prevent low-head drainage after the sprinkler zone is turned off.

Plant Choice

Plants used for landscaping must be native and drought tolerant. The City of Austin's Grow Green Guide (http://austintexas.gov/department/grow-green/plant-guide) can be used as a reference for appropriate plants.

Turf grasses should be limited to low-water-use turfs such as bermuda grass, zoysia grass, and buffalo grass. St. Augustine grass is not an approved turf grass.

Invasive plants shall not be used. The City of Austin's Grow Green Guide can be used as a reference for invasive plants to avoid.

Plant Prepping

A. A hole dug for a plant or tree should be 2 to 3 times wider than the container or root ball the plant is being stored in, ensuring that water will be able to be absorbed by the plant's roots.
B. Before the sodding or seeding with a recommended turf grass, make sure that the existing soil has been blended with compost.

Plant Placement and Spacing

A. Proper plant placement and spacing is critical to plant health and long-term landscape quality. Proper plant spacing ensures good air flow and room for plants to mature without crowding
B. Plant placement too close to buildings can cause problems with plant disease, insects and structural problems.
C. The mature height and width of plants should be considered before planting them.

Mulch

A. All areas planted with trees, perennials and shrubs shall be finished with a 2-inch to 4-inch deep layer of high quality 50/50 blend of non-acidic organic mulch and compost blend.
B. Wood chip mulch must be clean wood chips free of man-made debris, shredded into coarse pieces ranging in size from 1 to 3 inches.
C. Rock mulch shall be used in planting beds only as temporary mulch until full plant coverage is achieved, or as permanent mulch in areas with native shrubs and perennials.

Maintenance

The CoLV recommends the following turf and plant maintenance schedule:

A. Replenishing the mulch/compost blend only during the fall or spring at a minimum of every other year.
B. Aerate turf grass within the first year of installation then twice a year after that during the fall or spring.
C. Top dress turf grass areas with quality compost twice a year during the fall or spring at a depth of 1/4-inch to 1/2-inch following the aeration and drag or rake it into the canopy and/or aeration holes.

Appendix E – Swimming Pool Construction Requirements

A. Private residential swimming pools shall not be installed with open pit sand media filters.
B. Pool water features installed with public swimming pools or private residential swimming pools must be designed so that the water feature can be turned off without affecting the filtering capabilities of the pool. Automatic pool fill features must be designed so that they may be turned off in both public swimming pools and private residential swimming pools.
C. Pools with shared water between the pool and spa shall be designed so that water can be shared without the necessity of an above ground water feature that cannot be turned off. If a water feature between the spa and the pool exists, the default setting will be for it to be turned off.
D. Automatic pool fill features must include an automatic pool shut-off feature.
E. Vanishing or negative edge pools must be designed with catch basins large enough to prevent splashing that leads to increased water use.
F. Backwash systems must be designed so they may be turned off.
G. Pool skimmers should be managed in such a way as to minimize water consumption. The range of allowable water within the skimmer fill range should allow for several inches of evaporative loss prior to filling.
H. All residential swimming pools filled with a garden hose shall have a hose end timer installed at the nearest hose bib location. In addition, a hose bib back-flow prevention device will be connected to the hose bib fixtures nearest to the pool.
I. The CoLV recommends that all residential swimming pools should be installed with a permanent automatic pool cover to minimize evaporative loss when not in use.
J. Pool companies that provide installation and/or maintenance services within the CoLV must provide in writing to every customer specific information on maintenance requirements that includes an emphasis on preventative measures for keeping pool water quality high and alternatives to draining pools to correct water quality problems unless draining is needed for physical repairs.

PASSED AND APPROVED THIS 18th DAY OF JANUARY, 2018.

CITY OF LAGO VISTA

Ed Tidwell

Ed Tidwell, Mayor

ATTEST:

Sandra Barton

Sandra Barton, City Secretary

On a motion by Councilman Smith, seconded by Councilman Williams, the above and foregoing instrument was passed and approved.