Commercial Site Assessment™ Tier II

Prepared for:

Winslow Green Townhome Association

20022 Homestead Ct
Lakeville, MN 55044

2020 Season

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Conserva Irrigation's Methodology and Approach

1. Perform Commercial Site Assessment (CSA™)

- **Tier I CSA™:** High Level Water Use Assessment
  - irrigated acreage data from water purveyor
  - Obtain water usage reports from the water purveyor
  - Determine overall application efficiency
  - Develop water usage goals
- **Tier II CSA™:** "Boots on the Ground" System Assessment
  Tier I CSA, plus:
  - Full hydraulic and electronic asset assessment
  - Observe and record system functions
  - Perform risk assessment/exposure analysis
  - Document system repairs and improvements

2. Prioritize Critical Repairs/Adjustments to Optimize the System Performance

3. Recommend Efficiency Upgrades

- Replace inefficient spray nozzles with highly efficient Toro Precision™ Series Nozzles or Hunter MP™ Rotary Nozzles
- Recommend potential system additions and redesigns

4. Optimize the System Performance

5. Annually Maintain and Monitor the Irrigation System

Commercial Site Assessment™

Date of Tier I CSA: August 21st, 2020
Certified Technician: Garret Peterson, CLIA, CIT

Date of Tier II CSA: August 21th, 2020
Certified Technician: Garret Peterson, CLIA, CIT

Irrigated Acres: 3.24
Irrigated ft^2: 141,213.80 ft^2

Winslow Green Townhome Association - System Audit Observations

Winslow Green has 1 water source and 1 controller with 12 zones total.

- ***Controller:*** Hunter Pro-C (2016) 12 zone controller.
    - *Hunter Rain Click Wireless Rain Sensor* – Battery dead. Unfortunately, Hunter brand wireless sensor batteries cannot be replaced and the whole unit would need to be swapped out. Recommend switching to a wired rain sensor for increased life span/functionality.
    - *Program A:* Start 11pm, even days, zones 1-12

Controller is a basic "set and forget" controller. Recommend upgrading controller with a Smart Controller Faceplate with Hotspot for internet access to local weather data. Smart controllers manage water use based on weather data and plant need (evapotranspiration), reducing overall use and saving water.

Some zones across the property do not account for microclimate separation. These zones irrigate both front yards (dry hot microclimates requiring more irrigation) and backyards (wet cool microclimates requiring less irrigation) with the same amount of water. Irrigating differing microclimates on the same zone results in soaked backyards that can have standing water and promote disease as the front yards require more water. It can also cause under watered and dry front yards if you water less than normal to address the backyards watering needs. Without installing new zones, this issue is hard to resolve. Replacing nozzles (modifying application rates) for these areas is also not an option as the heads are an old model and the nozzles for the head are not made anymore.

Zone 1 has rotors watering in between houses about 12' and are not designed to be turned down below 26' of throw. This is creating poor coverage and over watering of the area.

- Solution: Redesign and install Hunter MP™ Rotary nozzle heads for those areas.

System Audit Observations Continued

Zones 2 & 6 by the front entrance have rotors that are watering over sidewalks and the fence. Water on the sidewalk ends up as run off into sewer lines and is wasted. Water hitting the fence can cause premature ware and/or staining and does not go through the fence well if the intent is to water the other side of the fence.

- Solution: Replace rotors with Hunter MP™ Rotary nozzle heads for efficient coverage and to reduce water waste and fence ware/stains.

Zone 8 has two heads right next to each other, likely due to moving a head for a new patio install.

- Solution: Move head to other side of patio to cover the area it used to cover before the patio was installed.

Water Rates:

Meter Reading Interval: ☐ Monthly ☒ Quarterly ☐ Other _____

Units Measured As: ☒ 1000 gallons ☐ CCF

Converted Units: ☒ 1 unit = 1000 gallons

WATER RATES	Irrigation Metered System
Price per unit (per 1,000 gals)	$5.64
Threshold per quarter	Irrigation Metered System
Sewer Rate per unit (if unmetered):	Does not apply

Historical Water Usage:

Water Source #1

Year	Annual Water Usage (gallons)	Annual Water Cost*
2019	378,000	$2,132.00
2018	865,000	$4,879.00
2017	1,177,000	$6,638.00
2016	1,097,000	$6,187.00
2015	821,000	$4,630.00
2014	778,000	$4,388.00
2013	1,834,000	$10,344.00
2012	1,449,000	$8,172.00
2011	845,000	$4,766.00
2010	1,100,000	$6,204.00
10 Year Average	1,034,400	$5,834.02

*Based on current Water Rates for best year to year comparison.

Plant Water Requirement (ET Data & Average Effective Rainfall):

Plant Material: **601,493 gallons** Spend: **$3,392/yr.**

$$Eff\ \% = \frac{water\ need}{water\ use} \qquad Eff\ \% = \frac{601{,}493}{1{,}034{,}400} = \mathbf{58\%}$$

Minimum EPA efficiency standard = **75%**

Water Usage Goals:

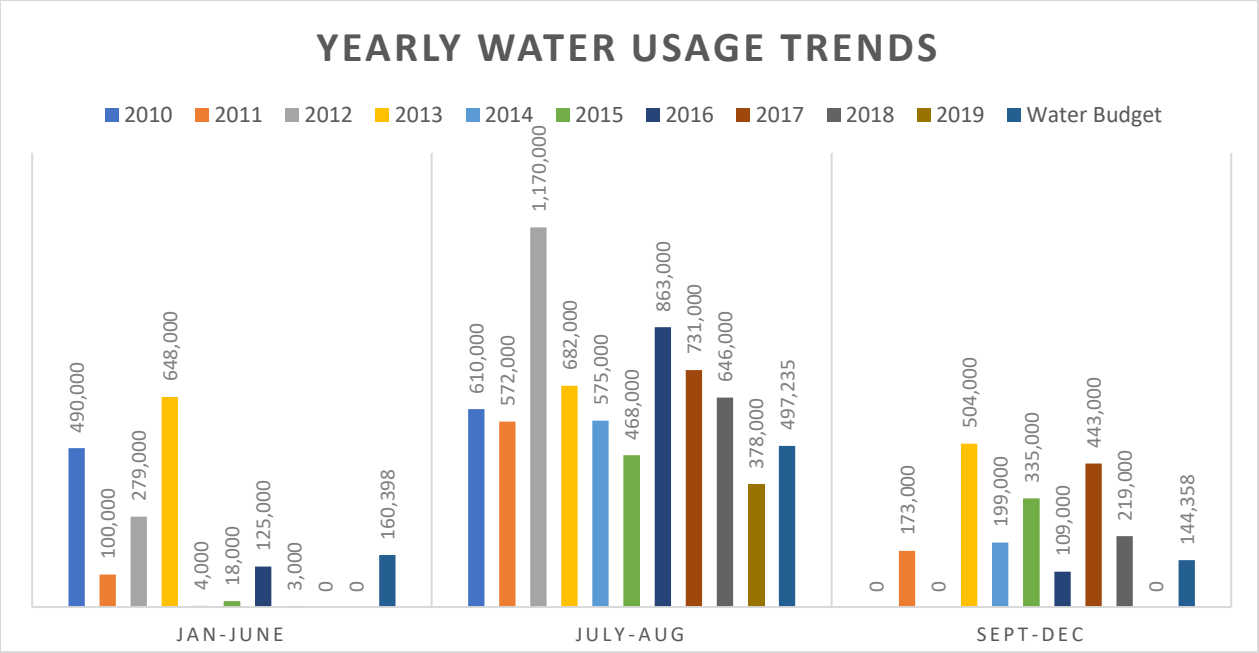
$Eff = 75\%$: 801,991 gallons used at an annual cost of **$4,523**

$Eff = 85\%$: 707,639 gallons used at an annual cost of **$3,991**

$Eff = 95\%$: 633,151 gallons used at an annual cost of **$3,571**

Water Budgeting:

Month	Jan-June	July-Sept	Sept-Dec	Total(gal)
2010 Usage	490,000	610,000	0	**1,100,000**
2011 Usage	100,000	572,000	173,000	**845,000**
2012 Usage	279,000	1,170,000	0	**1,449,000**
2013 Usage	648,000	682,000	504,000	**1,834,000**
2014 Usage	4,000	575,000	199,000	**778,000**
2015 Usage	18,000	468,000	335,000	**821,000**
2016 Usage	125,000	863,000	109,000	**1,097,000**
2017 Usage	3,000	731,000	443,000	**1,177,000**
2018 Usage	0	646,000	219,000	**865,000**
2019 Usage	0	378,000	0	**378,000**
Avg Usage	**166,700**	**669,500**	**198,200**	**1,034,400**
Water Budget	**160,398**	**497,235**	**144,358**	**(75eff)801,991**



System Components:

Water Source				Deficiency?
#1	Location	20022 Homestead Ct, Lakeville, MN 55044		
	Source	1 1/2” City Feed		
	Anti-syphon			
		Brand	Febco	
		Size	1 1/2”	
		Inspection Date	6-18-2020	
		Visual Inspection	No apparent leaks	
	Deduct Meter			
		Brand	Neptune	
		Size	1 ½”	
		Serial Number	61114115	
		Reading	581,700.50 Gallons	
		Visual Inspection	Good	
	Pressure Reducer			
		Brand	N/A	
		Size	1 ½”	
		Pressure Setting	90 psi	
		Visual Inspection	Good	
	Notes:			

Recommended Critical Repairs and Adjustments

	Zones												
Head Type	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***Total***
Total # Rotors	22	20	29	25	25	26	26	23	27	22	22	19	**286**
Total # Sprays													
Rotating Nozzles													
Mini Rotors													
High Pop Rotors													
6" Sprays													
12" High Pop Sprays													
Mixed Head Types													
Zone GPM	24	20	29	36*	30	29	27	27	28	25	28	24	-
Repairs	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***Total***
Damaged Rotors	3	2	2	1	2		1	2	3	3	4	1	**24**
Damaged 4" Sprays													
Damaged 6" Sprays													
Damaged High Pop Rotor													
Damaged High Pop Spray													
Line Leaks			1						1				**2**
Wrong Nozzles Sizing		3	2	10	2	2	2	2		15	10	9	**57**
Damaged Nozzles													
Raise/Straighten Heads		1	2		7	3		3	4	2	1	3	**26**
Design Improvements	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***Total***
Move Head				1			1	1					**3**
Add Head													
Cap a Head													
Zone Notes	Poor Design with rotors between houses	Poor Design by road entrance				Poor Design by road entrance							

Completed Critical Repairs and Adjustments

Repairs	Price (each)	Count		Total
1R.) Installed 5" Rotor	$ 50.00	24		$ 1,200.00
2R.) Move Head (per foot)	$ 15.00	3 heads total of 20'		$ 300.00
3R.) Poly line leak	$ 90.00	2		$ 180.00
				$ 1,680.00

Recommended Efficiency Upgrades

System Efficiency and Design Upgrades	Price (each)	Count		Total
1U.) Controller #2: Hunter Hydrawise Faceplate Upgrade w/Hot Spot for Internet access to local Weather Station Data	$ 250.00 + $ 15 a month	1		$ 250.00 + $ 15 a month ($180 per year)
2U.) Replace nonfunctional Rain Sensor	$ 150.00	1		$ 150.00
3U.) Zone 1- Convert rotors in short area to MP for better coverage	$ 200.00	1		$ 200.00
4U.) Zone 2 & 6 - Redesign with Hunter MP, eliminating overthrow and increasing efficiency	$ 600.00	2		$ 1,200.00
5U.) Change old rotor for a new rotor that can have a nozzle that matches the coverage area	$ 50.00	57		$ 2,850.00
6U.) Raise / Straighten Heads	$ 15.00	26		$ 390.00
				$ 5,220.00

In summary, completing the recommended critical repairs and upgrades will result in substantially more efficient water usage and healthier plant material.

Next Steps:

- ☐ Fix repair issues
- ☐ Move heads to a better position
- ☐ Upgrade controller to a Smart Controller based on weather
- ☐ Install new Rain Sensor
- ☐ Redesign areas not meant for rotors with pressure regulated and check valved spray bodies with MP rotary nozzles.
- ☐ Replace wrong nozzles or replace head if older model to match individual coverage areas
- ☐ Annually maintain and monitor property