

Commercial  
Site  
Assessment™  
Tier II

Prepared for:

Stone

Borough HOA

21309 Hytrail Cir.

Lakeville, MN 55044

2021 Season



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## Irrigated Area



### **Commercial Site Assessment™**

Date of Tier I CSA: September 29, 2021

Certified Technician: Jake Mathre CLIA, CIC, CIT

Date of Tier II CSA: June 30, 2021

Certified Technician: Jake Mathre CLIA, CIC, CIT

Irrigated Acres: 2.49

Irrigated *ft*<sup>2</sup>: 108,707 *ft*<sup>2</sup>

## **Stone Borough Audit Observations**

Stone Borough HOA has one water source and one controller with 20 zones.

### **Controller and Sensor:**

The onsite irrigation system controller is a Hunter ICC controller with 20 zones. This controller is not a smart controller (weather based) that is capable of remote monitorization, which results in inefficient watering. The controller programming is correct with most zones running for 30 mins every other day.

**Solution:** Retrofit the controller with a Hunter Hydrowise controller and a hot spot

There is a rain sensor on the system, however it is 15 feet in the air which makes testing it annually difficult without a higher ladder. Typically, 8 ft. ladders are carried by irrigation technicians.

**Solution:** Move the rain sensor to an appropriate height that allows for annual testing

A brass tee that is part of the water source piping is leaking.

**Solution:** Have a plumber fix the leak.

### **Zone by Zone:**

While walking the property, we found 47 of the 267 rotors need to be replaced. Also, 4 heads need to be raised or straightened for proper coverage.

**Solution:** Replace 47 rotors and Raise 4 rotors

There were some rotors in zones that had the wrong nozzle size installed for their area of coverage. Nozzles of rotors should change depending on area of coverage. If all nozzles are the same and the heads turn at a fixed rate, then areas covered by a 90° head will get more water and those covered by a 360° head will get too little.

**Solution:** Retrofit the remaining 220 rotors with new heads and correct nozzle sizes

The rotor zones along the back side of all the buildings had poor coverage/spacing. These zones need more heads added and some moved for correct spacing and coverage.

**Solution:** Move 12 heads and add 19 heads

## Water Rates:

Meter Reading Interval:  Monthly  Quarterly  Other \_\_\_\_\_

Units Measured As:  1000 gallons  CCF

Converted Units:  1 unit = 1000 gallons

<b>WATER RATES</b>	<b>Irrigation Metered System</b>
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:

<b>Year</b>	<b>Annual Water Usage (gallons)</b>	<b>Annual Water Cost*</b>
<b>2016</b>	670,000	\$4,235.64
<b>2017</b>	957,000	\$6,384.48
<b>2018</b>	639,000	\$4,026.96
<b>2019</b>	1,014,000	\$6,987.96
<b>2020</b>	1,129,000	\$7,354.56
<b>5 Year Average</b>	991,450	\$6,578.78

\*\* Average Taken from months with recorded water. Zero usage removed from average. Assuming if system ran, what would the average be?

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

Plant Material: **540,208 gallons** Cost: **\$3,047 /year**

$$Eff \% = \frac{\text{water need}}{\text{water use}} \quad Eff \% = \frac{540,208}{991,450} = 54.49\%$$

Minimum EPA efficiency standard = **75%**

## Water Usage Goals:

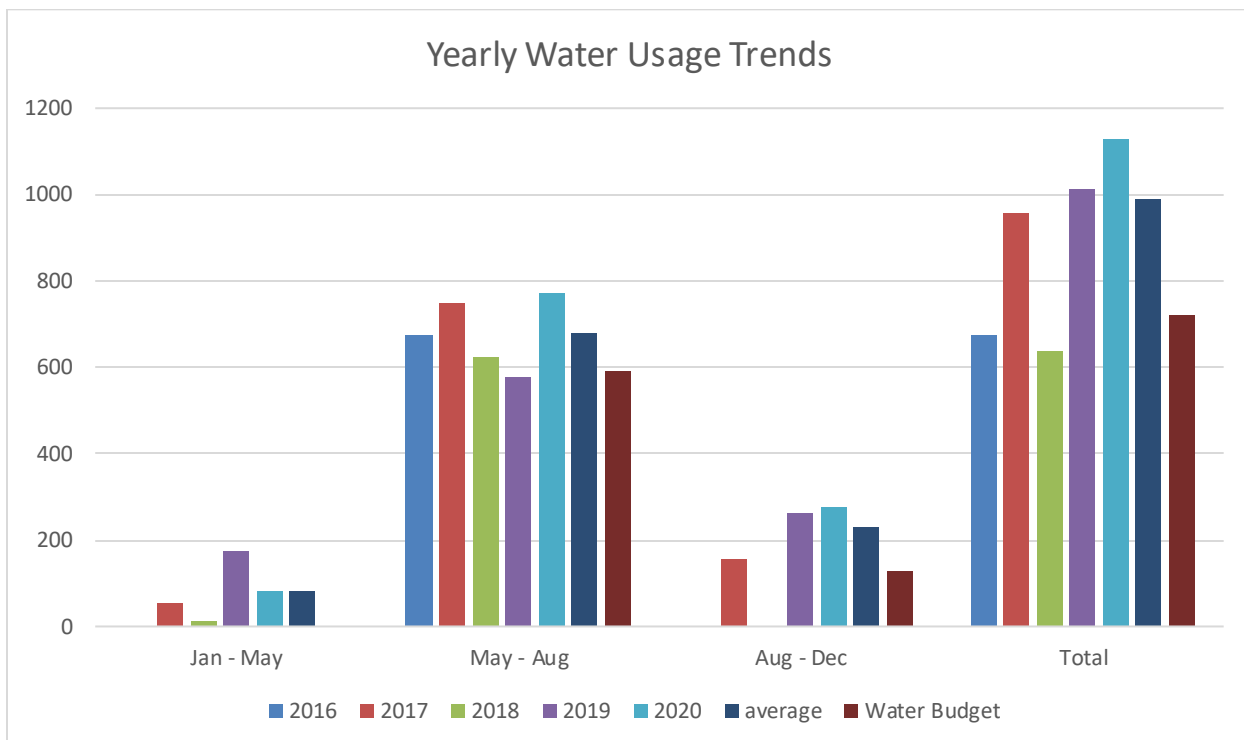
$Eff = 75\%$  : 720,277 gallons used at an annual cost of **\$4,626**

$Eff = 85\%$  : 635,539 gallons used at an annual cost of **\$4,148**

$Eff = 95\%$  : 568,640 gallons used at an annual cost of **\$3,771**

## Water Budgeting

	2016	2017	2018	2019	2020	average	Water Budget
Jan - May	0	54	14	173	80	80.25	0.00
June - Aug	676	749	625	578	773	680.2	590.06
Sept - Dec	0	154	0	263	276	231	130.21
<b>Total</b>	676	957	639	1014	1129	991.45	720.28



**Water Source and Backflow Prevention:**

WATER SOURCE						
<b>Water Source</b>	Location Address	21311				
	Water Source	City				
	Backflow Device					
	Brand	Wilkins		Model		
	Type	RPZ		Size	2"	
	Visual Inspection	Leaks?	No	Notes	Looks Good	
	Date of Last Backflow Test	6/11/2021			Unknown	
	Meter / Deduct Meter					
	Brand	Neptune		Model		
	Type	Digital / Analog		Size	2"	
	Serial Number	1568997606				
	Reading	383,231			Leak Detector Spinning?	No
	Visual Inspection	Leaks?	Yes	Notes	Leak on Brass Tee	

## Controller Data:

IRRIGATION CONTROLLER										
Location:		21309 - 21311								
Brand:		Hunter			Model:		I-Core		Zone Count	20
Start Times	#	Program A	Program B	Program C	Program D	Auxiliary	Sensors:		Rain	Weather
	1	11:00 PM	11:00 PM				Installed?		Yes	
	2						Bypassed?		No	
	3						Tested?		no	
	4						Functional?		no	
	5						Notes	15' High		
	6									
Water Days		Even					Remote Access Installed?			
							Cell Card		Active?	
							WiFi		Active?	
							Hand Held		Active?	
Ohm Reading	Zone	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Type	R = Rotor S = Spray D = Drip MP = MP Rotator B = Bubbler		
	1	30						9 Volt Back-up Battery		
	2	15						Installed?	Tested?	Voltage
	3	30						yes	yes	
	4	30						Controller Working?		
	5	30						Powered Up?	LCD Panel and Buttons Working?	
	6	45								
	7	30						yes	yes	
	8	30						Seasonal Adjust		
	9	30						Global Adjust %		none
	10	45						Monthly Adjust		
	11		30					Month	Currently Set As	Recommend
	12		30							
	13		30					January		
	14		30					February		
	15		30					March		
	16		30					April		
	17		30					May		
Open	18		30					June		
	19		40					July		
Open	20		30					August		
	21							Sept		
Open	22							October		
	23							November		
	24							December		
	25							Time Based should be Solar Sync		
	26									
	27									
	28									

Irrigation Controller

**Zone by Zone Findings:**

ZONE DATA											
ZONE	1	2	3	4	5	6	7	8	9	10	Totals
TOTAL # of Rotors	16	8	19	9	11	19	15	11	18	8	134
4" Rotor Broken	3		3	2	2	6	1	2	3	1	23
Add Heads			2	2	1		3	4	1		13
Eliminate Heads							1				1
Move Heads		1	2	2			2	2			9
Raise / Straighten											-

ZONE DATA											
ZONE	11	12	13	14	15	16	17	18	19	20	Totals
TOTAL # of Rotors	12	12	22	14	16	15	8	12	14	8	133
4" Rotor Broken	2	3	4	2			2	4	5	2	24
Add Heads		1	4							1	6
Eliminate Heads											-
Move Heads									2	1	3
Raise / Straighten		2	1	1							4



## Critical Repairs and Adjustments

Repairs	Price (each)	Count		Total
Installed Rotor	\$ 65.00	47		\$ 3,055.00
Fix Leak on Tee for Meter	\$ 200.00	1		\$ 200.00
Raise/Straighten Head	\$ 15.00	4		\$ 60.00
Move Rain Sensor	\$ 50.00	1		\$ 50.00

## Design Issues

Repairs	Price (each)	Count		Total
Heads Needing to be Moved	\$ 150.00	12		\$ 1,800.00
Heads Needing to be Added	\$ 150.00	19		\$ 2,850.00

## Recommended Efficiency Upgrades

Repairs	Price (each)	Count		Total
Smart Controller Upgrade	\$ 1,500.00	1		\$ 1,500.00
Upgrade ALL Rotors w/ Proper Nozzle Size	\$ 65.00	220		\$ 14,300.00

# Stone Borough HOA



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

## **Next Steps:**

- Fix critical repair issues
- Upgrade controller with smart controller
- Redesign areas along backside of units
- Annually maintain and monitor property