

# CITY OF WHITEFISH IRRIGATION & LANDSCAPE MASTER PLAN

---

IRRIGATION ANALYSIS,  
INSTALLATION & RETROFIT  
REQUIREMENTS

SUREWATER





406.250.2241  
www.surewatersystems.com  
735 W Center St. Kalispell, MT 59901

## SPRINKLER & SPECIALTY WATER SYSTEM DESIGN, INSTALLATION, & SERVICE

# TABLE OF CONTENTS

<b>IRRIGATION ANALYSIS.....</b>	<b>1</b>
IRRIGATION ISSUES.....	2
ISSUE 1: OVER PRESSURE.....	2
ISSUE 2: WIND DRIFT.....	3
ISSUE 3: LOW SET HEADS.....	4
ISSUE 4: CROOKED HEADS.....	5
ISSUE 5: LIVES LEAKS.....	5
ISSUE 6: LATERAL LEAKS.....	6
ISSUE 7: ADJUSTMENT ISSUES.....	7
ISSUE 8: LACK OF AUTOMATED TECHNOLOGY.....	10
A) REMOTE CONTROL / WIFI CONTROLLER.....	10
B) FLOW MONITORING.....	12
C) WEATHER SHUT OFF DEVICES.....	13
<b>IRRIGATION RECOMMENDATIONS.....</b>	<b>13</b>
SOROPTIMIST PARK.....	13
MOUNTAIN TRAILS PARK.....	15
MEMORIAL PARK.....	18
ARMORY PARK.....	21
HIGHWAY 93 SOUTH.....	24
HIGHWAY 93 NORTH.....	26
<b>IRRIGATION INSTALLATION &amp; RETROFIT REQUIREMENTS.....</b>	<b>30</b>
INTRODUCTION.....	30
EQUIPMENT OVERVIEW.....	30
IRRIGATION CONTROL.....	30
AUTOMATED MONITORING.....	32
AUTOMATIC CONTROL VALVES.....	32
APPLICATION.....	33
MAINTENANCE.....	33
DESIGN RESOURCES AND TOOLS.....	34
<b>APPENDIX.....</b>	<b>35</b>

## IRRIGATION ANALYSIS

The City of Whitefish has historically used potable water to irrigate the City's right-of-ways and open spaces. The goal is to conduct an in-depth analysis of existing irrigation infrastructure to provide recommendations to improve efficiencies and thus use less treated water.

**See the Appendix for a list of City Parkland and Open Spaces selected for evaluation.**

### INTRO

After evaluating the various independent irrigation systems throughout the City of Whitefish, a common theme was discovered: many of the City's irrigation systems are aging and in desperate need of time-consuming attention and repair. Most of the systems are showing signs of major wear; internal mechanisms of the sprinkler heads are worn and malfunctioning making it, in most cases, impossible for them to maintain adjustments or for them to even be adjusted at all. The older systems are also becoming buried in the growing turf depth and many sprinkler heads are no longer able to completely "pop-up" above the soil and grass, causing a blockage to the intended application of the spraying water. Across the board, the irrigation system controllers are old and antiquated, and not utilizing even outdated forms of weather shut off devices. Over the many years of repairs, the systems have become a veritable hodgepodge boasting an incongruent variety of parts and heads all within one irrigated zone. The various applicators disperse water differently and at altered rates, making for very inconsistent water application. Even throughout the newer systems, applicators are out of adjustment, controllers are being under-utilized and where there are weather shut-off devices, they are not functioning properly.

After observing the general operations of the Whitefish City Parks and Recreation Department for a full season, it's abundantly clear that the countless, varied and overwhelming number of tasks and responsibilities they bear simply does not allow them enough time to keep up on irrigation system maintenance.

## IRRIGATION ISSUES

The problematic issues detailed below were observed throughout most of the irrigation systems managed by the City of Whitefish and the examples shown are not isolated only to the sites pictured.

### ISSUE 1: OVER PRESSURE

Over pressure occurs when the water pressure entering the system and exiting the sprinkler head, exceeds the manufacturer's recommended operating pressure for that sprinkler head. Higher pressure often results in inefficient application of the water being applied. It will cause water droplet size to shrink or even turn to mist, making them more likely to travel outside of the intended application zone. Pressure related wind drift is especially wasteful. It causes uneven coverage resulting in dry spots and ultimately forcing controller adjustment increases, wasting even more water.



Example 1A: Large amounts of mist drift up and away from the turf. This day at the Depot Park in downtown Whitefish, MT was not particularly windy but even light breezes can carry misted water away from the intended target.

## ISSUE 2: WIND DRIFT

Wind, even light breezes, can have tremendous effects on system efficiencies. Factors like high pressure and the sprinkler type will determine how much wind will affect the efficiency of sprinkler operation.



Example 2A: High pressure allows the wind to carry irrigation water far beyond the turf and onto the parking lot of the Mountain Trails Park and Ice Den.



Example 2B: Notice the area of wet pavement is almost the same size as the turf being irrigated at Railway St. along Depot Park in Whitefish, MT. Wet pavement, although a common sight, is NOT always a necessary evil. In this case it is mostly avoidable and clear evidence of high pressure related water issues coupled with wind drift and sprinkler type.

### **ISSUE 3: LOW SET HEADS**

As systems age, the turf base grows and sprinkler heads become buried. The annual fall die-off slowly decomposes, turning to soil and as the years pass, that soil base grows significantly. Sometimes sprinkler heads are improperly installed too low right from the start which impacts their operation almost immediately. But in the case of the City of Whitefish, it is predominantly system age that is causing this type of inefficiency.



EXAMPLES 3A + 3B: This sprinkler head located at the Hwy 93 South Commons, is so low that the water stream can barely make it beyond the turf that is impeding it. Notice the amount of water traveling down the curb directly towards the storm drain. These types of zones normally need to run for as much as an hour to achieve adequate watering requirements. This photo was taken after only a few minutes of operation and already shows significant water wastage. Imagine how much water is wasted in an hour of run time! This is only one head at one location, but low heads are present at nearly all Whitefish managed sites.

#### **ISSUE 4: CROOKED HEADS**

Angled and crooked heads have a drastic impact on efficiencies. A crooked head will apply water very heavily within a small area on one side, while spreading the same amount of water very broadly over a much larger area throughout the opposite side. This often results in water missing its intended target entirely which leads to both dry spots and flooding/swampy areas.



EXAMPLE 4A + 4B: Above are clear examples of crooked heads at Armory Park and Mountain Trails Park.

#### **ISSUE 5: LIVE LEAKS**

This occurs when water is leaking from a system even when the controller is not running.



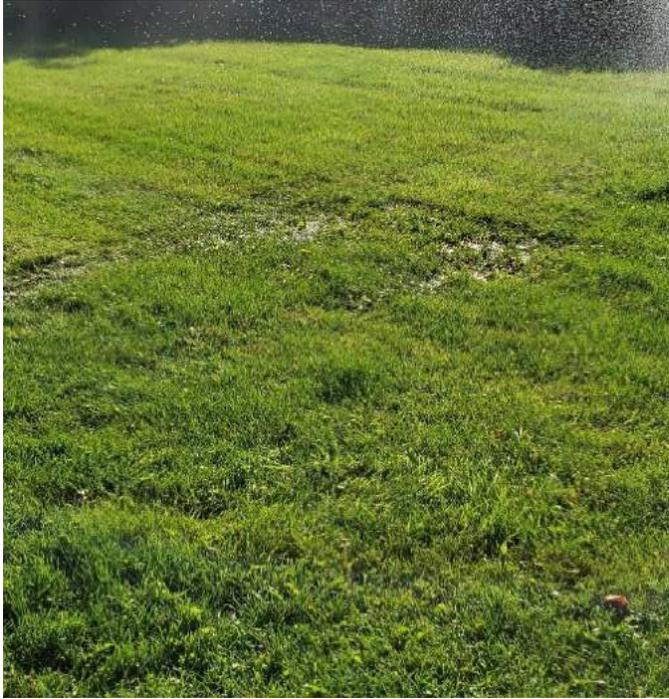
EXAMPLE 5A: This live leak at the Highway 93 West Commons is located at the irrigation point of connection. Even slow leaks eventually add up to considerable water wastage throughout the operating season. The leak was dug up by the City prior to our arrival but was not fixed, indicating to us that the repair was intended but there was no time available to execute it. The over-engineered installation specifications of this backflow preventor makes repairs like this one extremely difficult for City employees and clearly does not offer additional protection for the backflow prevention equipment.

## ISSUE 6: LATERAL LEAKS

Lateral leaks consist of any unintended water loss down the line from the automatic control valves. This loss of water only occurs when the system is actively running during a programmed time on the controller.



EXAMPLES 6A + 6B: Water wastage was not due to a broken component, but rather mismanagement of this system. This is a drain valve used for seasonal services and it appears to have been left open throughout the 2020 operating season. This valve connects to 1/2" pipe which means that tremendous amounts of water poured through it, flooding the box and soaking the ground around it whenever the low volume drip zone operated. Drip zones are generally programmed to run for up to several hours at a time - this means hours and hours of water pooling into the surrounding area every time the drip ran. Location: Downtown Public Library - Whitefish, MT.



EXAMPLE 6C + 6D: In 6C, a sprinkler head located at the Public Library in Whitefish, MT has broken from the connective fitting and the water from the break flows across the sidewalk, building up in the adjacent lawn creating a swamp-like area with standing water in 6D.

### **ISSUE 7: ADJUSTMENT ISSUES**

Throughout the City of Whitefish, countless sprinkler heads are simply out of adjustment and are no longer applying water to the intended turf areas. In some cases, this is due to aging system components that have worn out to the point that they are no longer adjustable. In other situations, the components were never adjusted properly when initially installed.



EXAMPLE 7A: This sprinkler head at the Public Library in Whitefish, MT is clearly adjusted into the rocks and onto the sidewalk, missing the lawn entirely.



EXAMPLE 7B: Not only is there too much water pressure to this sprinkler head, it is also mis-adjusted resulting in water running directly into the gutter and also spraying directly into the storm drain.



EXAMPLE 7C: After only three minutes of the fifteen minute runtime, water has made its way almost all the way down the gutter to the storm drain at the Public Library.



EXAMPLE 7D: In this section of turf at the Whitefish Library, the sprinkler heads are adjusted to spray just as much into the street, as they are adjusted to spray onto the actual turf.



EXAMPLE 7E: In this section of turf along Highway 93, the sprinkler heads are also adjusted to spray just as much onto the street, as they are adjusted to spray onto the actual turf. It appears that they were never adjusted properly even upon installation.



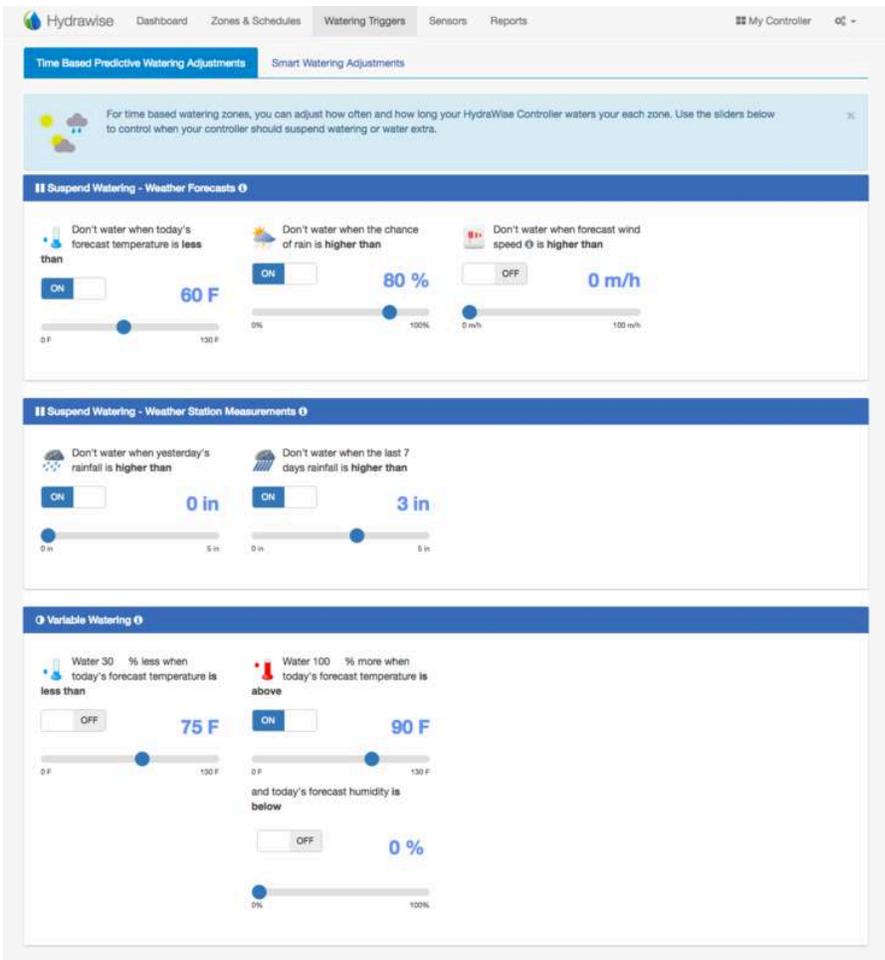
EXAMPLE 7F: Above is an example of multiple issues located at Highway 93 South location: Low heads, high pressure and mis-adjustments all make quick work of sending water straight into the gutter and down the storm drain

### **ISSUE 8: LACK OF AUTOMATED TECHNOLOGY**

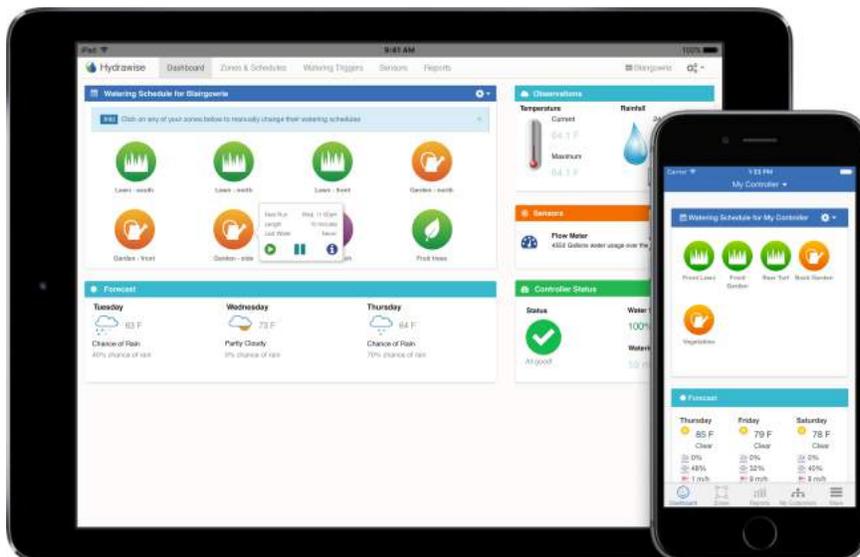
The technology trifecta: a wifi based controller, mini-weather station/water shut off device and flow monitor all work together to eliminate tremendous amounts of water waste.

#### **A. REMOTE CONTROL / WIFI CONTROLLER**

Hunter's Hydrowise Cloud Based Water Management Software will allow irrigation managers to monitor systems and make scheduling adjustments remotely. Furthermore, Hydrowise Predictive watering software uses forecasted or onsite weather data to automatically make scheduling adjustments to save water.



EXAMPLE A1: Predictive watering is even more effective by tailoring the parameters to needs of each specific site



EXAMPLE A2: The Hydrawise software interface can be accessed via phone, tablet or computer from anywhere!

## B. FLOW MONITORING

Flow monitoring sends instantaneous alerts in the event of high flow, low flow or unscheduled flow conditions. In the event of a break, an alert can be sent directly to the water system manager for inspection and repair. Given the sheer size and scope of the Parks and Recreation managed sites, this technology is imperative.



EXAMPLE B1 and B2: Hydrawise software records and manages flow data in order to generate detailed usage reports.

## C. WEATHER SHUT OFF DEVICES

A Weather Shut Off device is a piece of automated equipment that interrupts the automatic watering schedule during adverse weather conditions: rain, wind and freezing temperatures. They save water and can potentially prevent washout, soil depletion, overwatering, freeze breaks and groundwater flooding. Only one out of the twenty-seven inspected irrigation systems in the City of Whitefish is fitted with a weather shut off device and it is NOT functioning. This means that at most site locations, sprinklers are probably often running in the rain.



EXAMPLE C1: This is a mini weather system that measures rain, wind and temperature.

## IRRIGATION RECOMMENDATIONS

The following text covers the evaluation of selected sites along with irrigation recommendations.

### **SOROPTOMIST PARK**

This park has an aging system that was installed properly but the components are wearing out. When the playground equipment was installed, the automated control system wiring was damaged and never repaired, resulting in the need for multiple controllers across a small site. This makes it very difficult for system managers to efficiently schedule automated watering times. As repairs were made over the years, multiple unrelated products and brands were used leading to a very uneven and inefficient application of water as this myriad of applicators are distributing water at various and incongruent rates.

### Irrigation Recommendations for Soroptimist Park:

1. Repair or replace control system wiring to get down to one controller.
2. Replace controller with Wi-fi capable model i.e. Hunter Hydrowise or equivalent.
3. Install a flow sensor and master valve to monitor and control unintended water use.
4. Install mini weather station to prevent unnecessary water use during adverse weather conditions.
5. Retrofit all sprinkler heads with the appropriate pressure regulating model for a more balanced water application.

### System Details for Soroptimist Park:

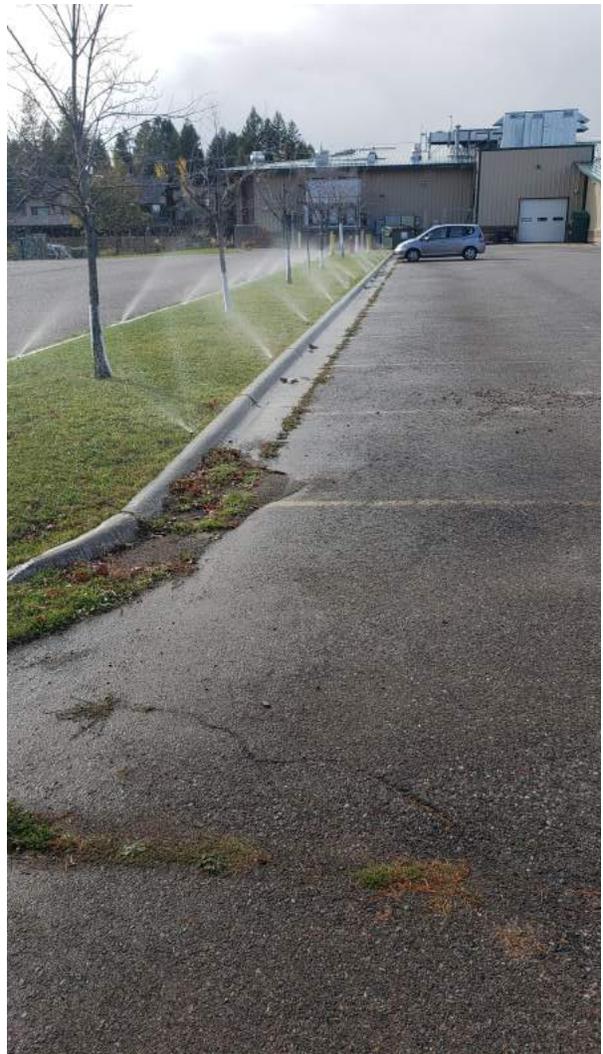


- Water Meter: Newer 1" Meter in Pit
- 2018 - No Data
- 2019 - 38,240 gallons
- 2020 -
- Automatic Valves: Primarily 1" Hunter globe style
- Applicators: Hunter PGP rotors and PS 4" sprays
- Weather Shut-off device: **NO**
- Infrastructure: Unknown piping, PVC Valve Manifolds
- Controller: Hunter Pro-C, Hunter 2 station Node

## MOUNTAIN TRAILS PARK

Several areas of unnecessary irrigation/turf exist in this park (consider landscape alternatives), along with head mis-adjustments, crooked heads, and easily corrected wiring issues (zones wired together) due to an undersized automated controller. When incongruent zones are wired together it's a problem because they have mismatched watering requirements. This system has higher than optimal water pressure, resulting in water waste due to wind drift.





## Irrigation Recommendations for Mountain Trails Park:

1. Eliminate turf area sprinklers between Alpine Market and Mountain Trails Park and replace with low volume drip (consider more appropriate landscape alternatives).
2. Isolate or eliminate unnecessary irrigated zones on the eastern side of the East Mountain Trails Parking Area.
3. Retrofit all spray style heads and nozzles with Hunter MP Rotator Nozzles and PRS40 Pressure Regulated Spray Bodies or eliminate spray altogether and convert to drip for new landscaping.
4. Replace controller with Wi-fi capable model i.e. Hunter Hydrowise.
5. Install a flow sensor and master valve to monitor and control unintended water use.
6. Install mini weather station to prevent unnecessary water use during adverse weather conditions.



### System Details for Mountain Trails Park:

- Backflow Preventer: 1" Wilkins Double Check
- Water Meter: 1" meter in pit
- 2018 - 9,240 gallons
- 2019 - 604,140 gallons. Leak/Break in August?
- 2020 -
- Automatic Valves: Varied
- Applicators: Primarily Hunter PGP Rotors, Hunter 4" Pro Spray
- Weather Shut-off device: **NO**
- Infrastructure: Unknown piping, PVC Valve Manifolds
- Controller: Hunter Pro-C 13 Stations

### MEMORIAL PARK

Memorial Park has a very conventional system comprised of two different points of connection and two controllers. The system has been relatively problem free over the years, but suffers from a lack of general maintenance. Heads are mis-adjusted and/or crooked. One zone near the basketball court has a variety of mismatched applicators that could benefit from a retrofit or it could be removed entirely and repurposed into something more useable for individuals enjoying the basketball and pickleball courts (picnic tables, etc).





### **Irrigation Recommendations for Memorial Park:**

1. Retrofit all spray style heads and nozzles in various sections with Hunter MP Rotator Nozzles and PRS40 Pressure Regulated Spray Bodies.
2. Eliminate turf in unused northern section along East 2<sup>nd</sup> Street and Pine Ave and replace with native landscape, utilizing drip irrigation.
3. Significant head adjustments needed.
4. Replace controller with Wi-fi capable model i.e. Hunter Hydrowise.
5. Install a flow sensor and master valve to monitor and control unintended water use.
6. Install mini weather station to prevent unnecessary water use during adverse weather conditions.



### System Details for Memorial Park:

- Backflow Preventer: 1 - PVB720A; 2 - Unknown
- Water Meter: 1' and 2" (flooded vault)
- 2018 - 395,900 gallons
- 2019 - 515,820 gallons.
- 2020 - 378,070 gallons
- Automatic Valves: Irritrol 1"
- Applicators: Hunter PGP Rotors, PS 4" Spray Head
- Weather Shut-off device: **NO**
- Infrastructure: Unknown
- Controller: 2 Hunter Pro C

## ARMORY PARK

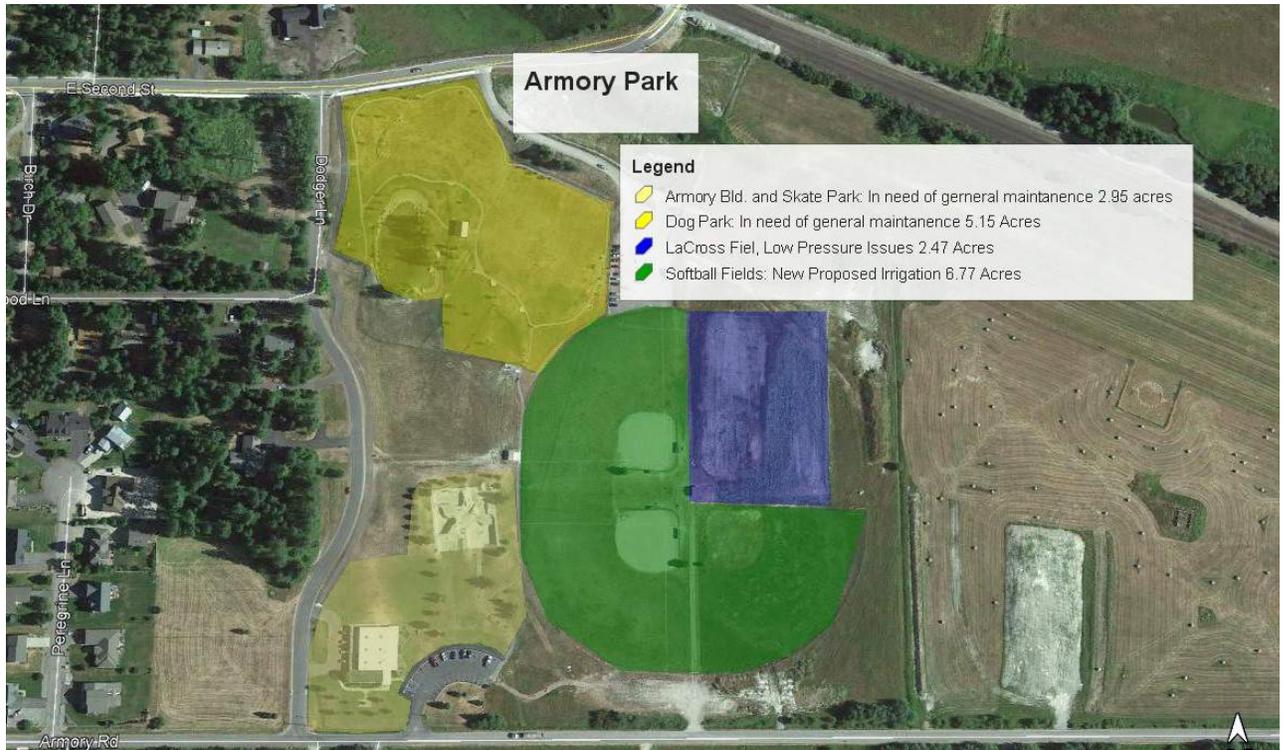
“Armory Park” encompasses multiple locations including the Armory building, the Dog Park, the Skate Park and the Softball & Lacrosse Fields. Of the Parks and Recreation managed locations, this is the largest water user coming in at 2,905,600 gallons on average annually. This number will climb when the softball fields become irrigated in the coming years. Armory Park underwent six phases of installation (soon to be seven) and the styles & design standards differ from one section to the next, making it incredibly difficult to schedule efficient automated watering across the board. Most sections have high pressure with the exception of the Lacrosse field which is experiencing low pressure due to friction loss from poor system design. This large site and limited water availability add further challenges to the irrigation schedule. There is one point of connection and two controllers for part of this system. Only one controller can run at a time. Simply put, there is just not enough hours in the preferred watering window to adequately water all of the zones.





### **Irrigation Recommendations for Armory Park:**

1. A solid system run through - massive head adjustments and straightening of crooked heads.
2. Combat pressure issues by utilizing Hunter AccuSync Pressure Regulators or equivalent.
3. Address low pressure issue at lacrosse field by re-nozzling the current heads to use less water, thereby reducing friction loss and increasing pressure.
4. Replace controllers with Wi-fi capable models i.e. Hunter Hydrowise or equivalent.
5. Eliminate water window constraints by installing a second point of connection or a point of connection that can handle the irrigation demand of the entire site. There is promising potential for a water well at this location, which would eliminate 3 million gallons of treated water use annually.
6. Install a flow sensor and master valve to monitor and control unintended water use.
7. Install mini weather station to prevent unnecessary water use during adverse weather conditions.



**System Details for Armory Park:**

- Backflow Preventer: 2" Wilkins PVB
- Water Meter: 2"
- 2018 - 2,915,500 gallons
- 2019 - 2,857,600 gallons
- 2020 - 2,212,900 gallons
- Automatic Valves: 1"- 2" Hunter PGV Globe Style
- Applicators: Predominately Hunter PGP and Hunter I-20 Rotors; Rainbird 8005
- Weather Shut-off device: **NO**
- Infrastructure: Unclear / Mixed
- Controller: Dog Park - Hunter ICC; Lacrosse Field - Hunter Pro C; Armory Building/Skate Park - Hunter Pro C
- Flow Monitoring: **NO**

## HIGHWAY 93 SOUTH

The Highway 93 South Commons area is among the oldest of the city-managed irrigation systems and one of its largest water users, consuming on average, 2,647,100 gallons of water annually. The system exhibits nearly all of the issues previously outlined (over pressure, wind drift and each of the sprinkler head related problems) and it also often experiences live and lateral leaks which require repeated repairs made by Parks and Recreation staff.





### **Irrigation Recommendations for Highway 93 South:**

1. Sprinklers in these areas may be converted to low volume drip.
2. Replace all rotor sprinklers with 6" pressure regulated sprinkler head. At time of replacement, ensure that they are level and set at the correct depth. Adjustments for proper application to be made upon installation.
3. Replace controller with Wi-fi capable model i.e. Hunter Hydrowise or equivalent.
4. Install a flow sensor and master valve to monitor and control unintended water use.
5. Install mini weather station to prevent unnecessary water use during adverse weather conditions.

### System Details for Highway 93 South:

- Backflow Preventer: 3" Wilkins RP
- Water Meter: 4"
- 2018 - 2,915,500 gallons
- 2019 - 2,857,600 gallons
- Automatic Valves: 2" Toro
- Applicators: Varied
- Weather Shut-off device: **NO**
- Infrastructure: 3" PVC mainlines
- Controller: Toro Osmac - Radio Controlled
- Flow Monitoring: **NO**

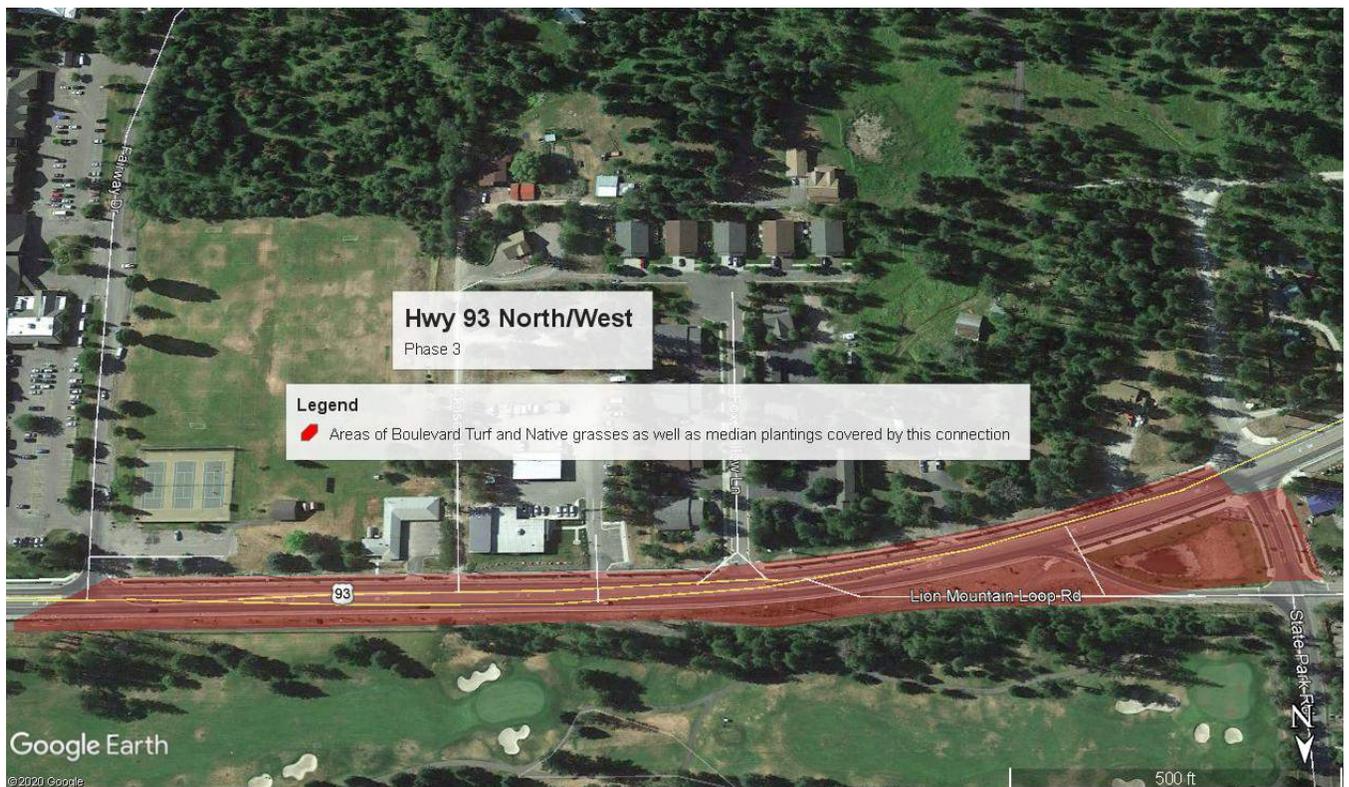
### HIGHWAY 93 NORTH

The newest phase of the Highway 93 North / West boulevard irrigation system is a perfect example of how a newer system, even utilizing today's technology, can still be incredibly inefficient. This system boasts many of the technologies we are recommending to be included in the new city standard, including pressure regulating sprinkler bodies and Hunter MP rotator nozzles, all set level and at the appropriate depth, although those heads seem to have never been adjusted upon their installation. One thing the system is lacking is remote control and flow monitoring equipment. There were many broken nozzles that would have been discovered immediately had flow monitoring been installed.



### Irrigation Recommendations for Highway 93 North/West:

1. Remove this system from City Water and add to the Whitefish Golf Course water source, saving on average 406,200 gallons of treated City water annually.
2. Replace controller with Wi-fi capable model i.e. Hunter Hydrowise.
3. Install a flow sensor and master valve to monitor and control unintended water use.
4. Install a mini weather station to prevent unnecessary water use during adverse weather conditions.





### System Details for Highway 93 North/West:

- Backflow Preventer: 2" PVB 720A, 2"Unknown Double Check Valve Assemblies
- Water Meter: 32"
- 2018 - 854,600 gallons
- 2019 - 916,200 gallons
- 2020 - 761,400 gallons
- Automatic Valves: 1" PGM100MB, 2"PGV200, Hunter PGM Drip Control Zones
- Applicators: Hunter MP Rotators, Pressure regulated spray bodies
- Weather Shut-off device: **NO**
- Infrastructure: PVC Mainlines
- Controller: Hunter Pro C and Toro Osmac

**NOTE**

Data for the other Whitefish City Parks and Recreation managed sites has been collected, but has not yet been compiled into this document. The sites listed below are exhibiting some or all of the common problems discussed in the report above.

These sites include:

- City Beach
- Kay Beller Park (includes Whitefish Manor Bike Path)
- Riverside Park
- Kiddie Park
- Grouse Mountain Park
- Depot Park
- Whitefish Library
- O'Shaughnessy Center
- 2<sup>nd</sup> Street Parking Lot
- Edgewood Overflow Parking
- City Hall
- Low volume systems like the hanging baskets and bulbout planters around downtown (these low volume systems are likely connected to the systems listed above)

# IRRIGATION INSTALLATION & RETROFIT REQUIREMENTS

## INTRODUCTION

In 2020 an evaluation of the irrigation systems managed by the City of Whitefish Parks and Recreation Department was performed by Sure Water Systems, Inc of Kalispell. A list of new irrigation system requirements was created from those findings. The institution of the requirements set forth in this document are designed to provide the City of Whitefish, MT Parks and Recreation with the level of control and monitoring they need to most effectively manage and maintain the irrigation systems in their care. Through better control, monitoring and management, the Parks and Recreation Department will be able to help the City of Whitefish substantially reduce their overall treated water use. Contractors awarded with the responsibility of installing or retrofitting landscape irrigation systems for the City of Whitefish, Montana, will adhere to this very clear set of standards. By doing so, they will greatly aid the city in their efforts and overall goal of using less treated water to maintain their public landscapes.

## EQUIPMENT OVERVIEW

Based on the 2020 evaluations, it was clear the primary brand of irrigation related equipment currently in use by the city was manufactured by Hunter Industries. To maintain a high level of efficiency, all new installations, as well as the retrofit and rehabilitation of existing irrigation systems, will utilize only the Hunter Industries components discussed in this document. The purpose of this manufacturer choice is to provide congruency throughout the city's irrigation systems. This will allow city employees to handle maintenance related issues faster and more efficiently. Instead of having to carry and/or purchase a plethora of varied irrigation related repair components, they can stock these core items and have them on hand for repairs. These components include: hydrowise enable automatic controllers, pressure regulated spray, pressure regulated single stream rotors, accu-sync pressure regulators, flow sensors, and weather shut-off devices. The exceptions to these requirements are **components related** to the distribution of water throughout the landscape. These exceptions include point of connection related parts and piping, backflow prevention, mainline piping, lateral line piping, drip piping, pipe fittings, the connections between lateral lines and the applicators, and drip related applicators. The choice of manufacturer of the above listed exceptions will be left up to the landscape irrigation designer or installation contractor and will most likely be dictated by current product availability.

## IRRIGATION CONTROL

A software-based form of irrigation control will become the city's standard for all Parks and Recreation managed systems. Hunter Industries' Hydrowise software equipped controllers

will allow city employees to control the irrigation systems remotely, eliminating the need to make specific site visits for simple water scheduling adjustments. This software will integrate seamlessly with the flow monitoring and weather shut off devices located at each site. Although there are other remote software options available through Hunter Industries, the sheer number of small independent sites managed by the Parks and Recreation Department makes the Hydrowise software and its associated components the best and most perfect option. The controller and controller related components available are listed below. They are to be specified for use during the design process of future irrigation related projects prepared for the City of Whitefish, MT. The applicable option will be up to the discretion of the designer and should be sized to accommodate the project in question as well as any future potential use at the project site. If there is a possibility of future expansion, a controller that offers a two-wire decoder option shall be specified.

- HPC-400 4-station base: Domestic 120 VAC indoor/outdoor controller
- HPC-FP Hydrowise retrofit front panel for Pro-C controllers (March 2014 or newer models)
- PCM-300 3-station plug-in module: Use to increase station count from 4 to 7, 10, or 13
- PCM-900 9-station plug-in module: Use to increase station count from 7 to 16
- PCM-1600 16-station plug-in module: Use to increase station count to 23
- HCC-800-PL8-station base model, plastic outdoor, wall mount
- HCC-800-M8-station base model, gray metal outdoor, wall mount
- HCC-800-SS8-station base model, stainless steel, wall mount
- HCC-800-PP8-station base model, plastic pedestal
- HCC-FPUP Retrofit upgrade kit for ICC and ICC2
- ICC-PED Gray pedestal for metal wall mount cabinet
- ICC-PED-SS Stainless steel pedestal for stainless wall mount
- ICC-PWB Optional pedestal wiring board for metal pedestals
- WIFI-EXT-KIT Wi-Fi antenna extension kit
- ICM-400 4-station plug-in module with enhanced surge protection
- ICM-800 8-station plug-in module with enhanced surge protection
- ICM-2200 22-station expansion module (maximum one per controller)
- EZ-DM54-station decoder output module (one per controller)

- EZ-1 Single-station EZ decoder

## **AUTOMATED MONITORING**

All future irrigations systems will be fitting with flow monitoring and weather shut off devices. Below is the list of approved Hunter Industries options that will integrate with the Hydrowise remote software. It will be required to have one weather shut-off device coupled with one appropriately sized flow meter and one wireless flow meter kit installed on every new installation.

- WR-CLIK Wireless Rain-Clik sensor and receiver
- MWS Weather station combines wind and rain sensors
- W-HC-FLOW Wireless HC Flow Meter Kit, includes transmitter and receiver (domestic 900 MHz)
- W-HC-FLOW-TR Wireless HC Flow Meter, transmitter only (domestic 900 MHz)
- W-HC-FLOW-R Wireless HC Flow Meter, receiver only (domestic 900 MHz)
- HC-075-FLOW HC Flow Meter with 3/4" male thread, U.S. gallon reading
- HC-100-FLOW HC Flow Meter with 1" male thread, U.S. gallon reading
- HC-150-FLOW HC Flow Meter with 1 1/2" male thread, U.S. gallon reading
- HC-200-FLOW HC Flow Meter with 2" male thread, U.S. gallon reading

## **AUTOMATIC CONTROL VALVES**

All automated irrigation control valves will be manufactured by Hunter Industries. Since the appropriate valve is determined by so many factors, the exact valve choice will be up to the discretion of the system designer.

The specification of a master valve fitted with an adjustable Hunter Accu Sync pressure regulator is required and will be installed downstream of the appropriately sized HC flow meter.

Zone control valves do not always require the use of an Accu Sync pressure regulator, for example, when the design specifies for the use of applicators (sprinkler heads) that offer built in pressure regulation. Any zones that specify the use of Hunter I-25 rotors or larger, a Hunter Accu Sync is required.

## APPLICATION

The use of pressure regulating equipment is important in the city's goal to using less treated water. The specification of applicators that offer built in pressure regulation is required when the design allows for it. In conjunction with pressure regulation all applicators must be installed with check valves. In the event applicators that do not offer built in pressure regulation are specified, the use of a Hunter Accu Sync fitting to the zone control valve is required. Below are the sprinklers heads approved for City of Whitefish irrigation installations.

- PGP-04-PRB-CV
- I-20-04-PRB-CV
- I-20-06-PRB-CV
- Any other I-Class Hunter rotor used in conjunction with Accu Sync pressure regulator
- PROS-00-PRS40 = 40 PSI regulated shrub adapter
- PROS-04-PRS40-CV = 40 PSI regulated 4" pop-up with drain check valve
- PROS-06-PRS40-CV = 40 PSI regulated 6" pop-up with drain check valve
- PROS-12-PRS40-CV = 40 PSI regulated 12" pop-up with drain check valve
- PROS-00-PRS30-CV = 30 PSI regulated shrub adapter
- PROS-04-PRS30-CV = 30 PSI regulated 4" pop-up with drain check valve
- PROS-06-PRS30-CV = 30 PSI regulated 6" pop-up with drain check valve
- PROS-12-PRS30-CV = 30 PSI regulated 12" pop-u with drain check valve

## MAINTENANCE

The following maintenance requirements must be noted within the invitation to bid: all new irrigation installations must come with a four (4) visit per season maintenance package for three (3) consecutive years. Along with the maintenance package, a craftsmanship warranty of at least three (3) years must be included. The Hydrowise controllers installed with new systems will be managed by Parks and Recreation employees. Installation contractors will be given remote access to the controller during the three (3) year period.

## **DESIGN RESOURCES AND TOOLS**

[https://www.hunterindustries.com/resource\\_guide/written-specifications](https://www.hunterindustries.com/resource_guide/written-specifications)

[https://www.hunterindustries.com/resource\\_guide/installation-details](https://www.hunterindustries.com/resource_guide/installation-details)

[https://www.hunterindustries.com/resource\\_guide/tech-and-education-guides](https://www.hunterindustries.com/resource_guide/tech-and-education-guides)

<https://www.hunterindustries.com/marketing-resources/designers/cad-legends>

<https://www.hunterindustries.com/hydrawise-wifi-contractor>

**APPENDIX**

City of Whitefish Parkland and Open Spaces selected for evaluation.

**Parkland and Open Spaces**

<b>Developed Parkland</b>			
<b>Park</b>	<b>Acres</b>	<b>Irrigation</b>	<b>Irrigation Comments</b>
City Beach	2	Yes	Grass area only
Soroptimist Park	1	Yes	All
Mountain Trails Park	4.5	Yes	Grass area only
Kay Beller Park	1	Yes	
Riverside Park	5	Yes	
Kiddie Park	2	Yes	
Memorial Park	9.5	Yes	Southeastern portion not irrigated / Twins on well
Armory Park	30	Yes	Softball fields and undeveloped land not irrigated
Grouse Mountain Park	7.8	Yes	Irrigated from lake water
Depot Park	2	Yes	All
James R. Bakke Nature Reserve	4	No	Nature Reserve
Roundhouse Landing	.5	No	River access point and bike path connection

<b>Undeveloped Parkland</b>			
<b>Park</b>	<b>Acres</b>	<b>Irrigation</b>	<b>Comments</b>
Trailview Park	1.3	No	Will be trailhead, parking lot, and restroom facility
Cottonwood Park	.33	No	Not yet accepted. Will be accepted when adjacent lot develops.
Cloud 9 Park	.5	No	Connects to Cottonwood
Creekwood Park	4.43	No	Drainage area, undevelopable
Canoe Park	.8	No	River access
Rivertrail Park	.77	No	River corridor and bike path
River's Edge Park	3.67	No	River corridor and bike path
Riverwood Park	4.5	No	Drainage
Riverlakes Park	20.8	No	Pond and river corridor
Skye Park	.5	No	River access point

<b>Other Irrigated Spaces</b>			
<b>Location</b>	<b>Distance</b>	<b>Irrigation</b>	<b>Irrigation Comments</b>
Whitefish Library	.5 acres	Yes	Grass area and north boulevard area
O'Shaughnessy	.33 acres	Yes	Grass area and north boulevard area
Hwy 93 S	1.28 miles	Yes	Intermittent connections
Hwy 93 N	2.5 miles	Yes	Sections never have worked properly since installation, including medians
Whitefish Manor Bike Path	.09 miles	Yes	Along bike path
2 <sup>nd</sup> Street Parking Lot	.06 miles	Yes	Boulevard irrigation
City Hall	.07 miles	Yes	Boulevard irrigation
Edgewood Overflow Lot	.04 miles	Yes	Boulevard irrigation
Bulbouts on Central Ave	16 bulbouts	Yes	Bulbouts
Flower baskets	75 plus	Yes	Driplines
Landscape beds		Yes	Dripline in parks