2012 Irrigation Presentation
Symphony Village Community

Irrigation System Background

- **Community Wide System**

  The community's irrigation system is quite large. Irrigation is spread throughout the entire community and includes irrigation of the front yards of all homes and common areas around the clubhouse and the front entrance road.

- **Supplied by 5 Wells**

  The system is supplied by 5 deep wells. Utilizing a pump for each well, water is drawn from underground and sent through main water lines to zone lines across the community. Although the entire system is divided into 5 sections, one for each pump, gate valves allow us to water all areas even in the event one pump breaks down.

- **126 Separate Zones**

  The irrigation system is divided into 126 separate zones that call all run independently of each other. In fact, the bed areas at each of the homes are water by separate zones than the turf in the front and side yards. This will allow us to treat the bed areas differently from the turf areas, based upon the needs of the plants and grass.

- **Water Usage Governed by MDE Permit**

  Currently, the Maryland Department of the Environment manages the water consumption from the wells through a water use permit. The permit has been in place since the opening of the community.

Water Usage

- **Permit Limit – 12 million gallons**

  The current permit allows for the drawing of 12 million gallons annually combined from all 5 wells that support the irrigation system. The requirements call for twice yearly reporting of the gallons drawn from the 5 zones.

- **Historical Usage – 16 million gallons**

  In 2011, the mid-year projected water use was 16 million gallons. This projection was based on the average daily usage coupled with the schedule that utilized a high frequency of watering. We were able to slightly reduce the total gallons drawn by the end of the year, due to the increase in precipitation we received in August and September. Although, to continue to water on the schedule set in previous years, our usage would exceed the permit limit and again reach the historical usage amount of nearly 16 million gallons.

- **Fines for Exceeding Permit Limits**

  The fine from MDE for exceeding the 12 million gallon limit could reach $5,000.00 per day. No fines have been levied by MDE, and we are working with them to stay within the limits imposed. Again, no fines have been charge to Symphony Village, although we are required to take the necessary steps to stay within the 12 million gallon limit.

- **Daily Average is 345,500 gallons**

  Running the entire irrigation system, through the course of on evening, including all turf and bed zones results in an approximate 345,000 gallons used.

- **Turf = 315,000 gal Beds = 30,000 gal**

Of the 345,000 total gallons, 315,000 are used for irrigating all turf areas and the remaining 30,000 gallons for the bed areas during each daily run of the irrigation system.

- **Full system-wide watering days = 34**

Using the above figures, we have calculated 34 'full watering' days available to water the turf and plant beds in the community.

At this point, knowing the parameters we must operate within, we began to analyze the turf and bed areas and explore ways to reduce waste within the system, while creating a plan to meet the irrigation needs of the community.

Identify Turf & Bed Needs

- **Turf vs. Beds**

The needs of grass are different than the needs of the bushes and plants in the bed areas, both at the homes and the community common areas. The water consumption needs of bushes, due to their root spread and root depth is far less than the needs of the Fescue grass in our region.

- **Seasonal Needs of the Turf**

The needs of the turf areas within the community vary throughout the growing season. At time more water is needed while at others less will be required.

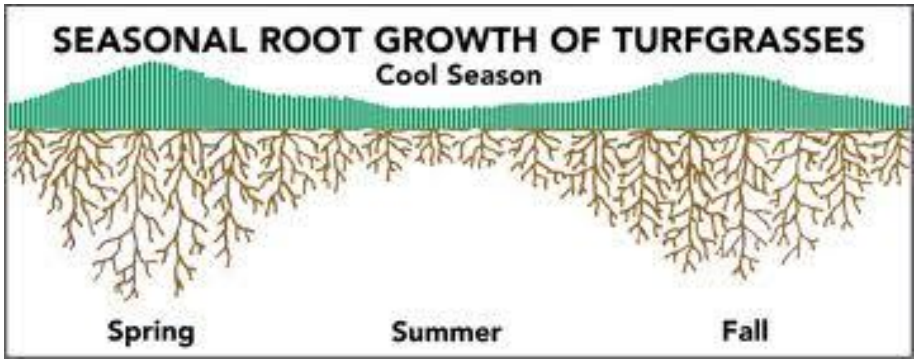
- **Soil Samples**

Soil samples are taken throughout the property at the beginning of each season. The results of these samples, whether it be changing the PH level in the soil or the need for organic material, will help us determine the true needs of the grass and bed areas and help improve the turf.

- **Root System Development**

Root system development is essential to the long term health of the turf. As depicted in the image below, root development is greatest during the turf non-dormant periods of March-June and September-November. Watering improperly can cause reduced root development. Proper root development is aided by the 'infrequent soaking of turf soils'. This means longer watering cycles less frequently during the year. Watering in this manner allows for water to get deep into the ground promoting deeper root growth. And, the deeper the root growth during the heat and humid summer months, the better chance for survival for the grass.

The soils supporting the turf areas need time to dry between waterings. Too frequent watering creates 'surface' water and turf will become dependent upon this ground level water, thus not fully extending its root grow deeper into the soil, where it is needed. Our irrigation schedule should allow time for surface drying which will force the turf roots to become more dependent upon sub-surface soil moisture. And this will greatly benefit the turf when the hot and dry months arrive.



This image shows turf root developed during three seasons of the year. It depicts both the depth and density of root growth.

Identify Waste in the System

- Runoff due to 'over watering'

  I am sure we have all witnessed the 'runoff' of water into the curb gutters. The constant, day to day watering prevents the soil from efficiently absorbing the water. The soil needs time between waterings to allow for better absorption.

- **Lake Effect between homes**

  Due to the overlapping of irrigation heads, from the side of one house to the adjoining house, turf areas between the some homes are being over watered. I say some homes because proper drying requires sufficient sunlight for drying. The orientation of the homes (east-west versus north-south) also play a part in the proper drying of the turf.

- **Plants Need Less**

  Due to the deeper root development, shrubs and trees need less water than the turf areas. A proper irrigation program should account for less water needed in these areas.

2012 Watering Plan –Goals

- **Staying within MDE Limits**

  This is our number 1 priority. Staying within the limits set by MDE will guarantee our avoiding the fines associated with the permit. We have requested an increase in the permit limit. But, MDE want to see 'proper conservation' and management under the current permit before entertaining an increase in the water usage.

- **Maintain Healthy Turf and Plants**

  As a landscaper, our job is to promote healthy turf growth, through both the growing and dormant seasons of the turf and shrub areas. With proper management, we can maintain healthy lawns and shrubs with the right balance.

- **Banking Days**

  From the beginning of the season, our goal should be to 'bank' watering days, saving the water for when it is needs most…during the hot and humid days of July and August.

2012 Watering Plan - Results

- **Frequency and Duration of Watering**

We will reduce the number of watering days (compared to last year) but increase the time for each watering cycle. We will allow for the proper drying of the soil between waterings to promote healthy root growth of the turf.

- **Seasonal Schedules**

We are setting our watering schedule to allow for the varied seasonal needs of the turf and shrubs.

- **Separate Bed watering schedule from Turf watering schedule**

Within the current system, we have separated the turf zones from the shrub bed zones. This will allow us to run the shrub bed zones less frequently, saving a little more water for the turf…where it is needed most.

- **Rain Gauge Management**

We will be monitoring the rainfall more closely. If a good rainfall occurs, we will delay the next watering day to allow for the proper soil drying. This will allow us to 'push' watering days to the middle of the summer when it is needed most.

- **Audit of system**

Each year, we will conduct a system wide audit with the Operations Committee. During these audits, we will look for, and correct, inefficiencies in the watering zones. An example would be shutting off some of the heads between homes that experience the 'Lake Effect' pooling of water each time the irrigation system runs.

- **Increase mowing height in the summer months.**

As your landscaper, we will also monitor the turf areas leading into the summer months. If we are unable to 'bank' more days for mid-summer watering, we may choose to slightly raise the mowing height of the turf areas. A slightly longer grass blade shades the soil areas and better deflects wind to reduce the evaporation of water from the soil. Retaining this extra bit of water will help the turf during their mid-summer dormant period.