

# Drip Irrigation



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## **Optimizing Home Drip Irrigation**

Mr. Jackovich and his wife Nancy retired and moved to Rio Rancho in early 2012 because they always enjoyed the southwestern United States. He is a licensed professional engineer and has worked on several wind-farm projects over the last few years; he still works on a part time basis as a consultant.

Our home in Rivers Edge 2 was built in the mid-1990s and the original drip irrigation system needed to be updated in order to maintain the plantings and reduce water consumption. Until the system was repaired in early 2013, the entire yard had to be watered by hand once a week, a process that took almost 2 hours.

The property is ½ acre with no grass and many perennials, trees and shrubs. Total length of the mainline irrigation system is 1,725 feet and the total number of emitters is almost 350. Other than hiring an irrigation contractor to upgrade the valve station, I did all of the other repairs myself.

### **Noted deficiencies were as follows:**

- Emitters were located at the trunks of each plant, not at the tree or shrub drip lines. They also were not properly sized for the planting.
- Many plantings had been removed or died and emitters were still active.
- There were multiple leaks due to disconnected distribution lines or plant root invasion.
- Only 2 valve stations were installed, resulting in minimal flow at the ends of the mainlines.
- Irrigation mainlines were not zoned hindering efforts to identify leaks.

### **Action plan:**

- Hired an irrigation contractor to replace the original 2 valve station with four pressure regulated valves.
- Tied the new valve supply lines to the ends of the two existing runs and then split the systems in half.
- Re-routed the irrigation system mainlines into four definite zones (front yard, backyard north, center and south).
- Moved all emitters to plant drip lines. Replaced with properly sized emitters to correspond with the type of plant.

- Repaired all water leaks. I identified over-watered areas by observing where bushes have grown faster than others in a hedge, where birds were actively looking for bugs or where the perimeter brick wall was water stained. I found other normally undetectable leaks by inserting a “T” with a garden hose adapter near the end of the mainline, connecting a hose and pressurizing the system to over 80 psi which is the household water pressure in my area. Minor leaks became visible via small geysers or if it was quiet, I could hear the water leak by walking along the line. I found one water leak that was buried below a patio stone this way.
- Optimized each valve “on” time using the following procedure. I counted the number of emitters on each valve and totaled the gallon/hour usage. I ran the system for 30 minutes, noting the water meter readings both before and after. I then subtracted the two readings, multiplied by 2 and compared the resultant number with the emitter total. For example, if I used 400 gallons and have emitters totaled 200 gallons/hour I set that valve to run for 30 minutes each time. Basically, longer mainline and more emitters per valve translated into a longer runtimes due to the pressure drop and lower flow rates. For example my four valve runtimes are 35, 37, 40 and 45 minutes.

**End result:**

Before optimization the system used 985 gallons inefficiently each time it ran; after optimization usage is 610 gallons, a 40% savings. Below is a picture of Jackovich’s yard after optimization.

