

WHITE PAPER

Reclaimed Water

A Solution for
Irrigating the World

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Overview

Earth's growing population continually demands a higher standard of living—a fact that is putting more pressure on our natural resources. Water is one example of a natural resource that now requires more conservation and management than ever before. Over the years, communities have learned the importance of recycling or reclaiming water in order to ensure continued economic growth and development. While some drought-prone and arid regions have used reclaimed water since the 1920s, its use has become more widely accepted in other areas over the past few decades. Worldwide appreciation for water as a vital resource has drastically improved over the past twenty years, and Rain Bird Corporation supports those visionary groups and individuals who have taken on the challenge to conserve natural resources and use water more wisely. Reclaimed water offers both benefits and challenges, and it has become an integral part of Rain Bird's efforts to help its customers meet their irrigation needs.



History

Many years ago, California experienced a sharp increase in population, along with a resulting higher demand for water to irrigate agricultural and urban areas. In the 1920s, the Los Angeles area became an early leader in water conservation by recognizing that there is a need to manage our limited resources. As far back as 1929, the City of Los Angeles provided reclaimed water for golf course irrigation. However, the development

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of communities in mostly arid desert regions like Nevada and Arizona during the 1960's led to the need for greater efficiencies in utilizing all forms of reclaimed water. The 1990s saw even a broader definition of reclaimed water from various sources and for use in other areas. Rain Bird has been at the forefront in working with these water consumers and helping them meet their demands. What follows are some of the insights that Rain Bird has developed over the past few decades and would like to share with our customers using reclaimed water throughout the United States.

Types of Water and Their Use

Initially, water reclamation, or recycling, was seen as a single, total process where water that was not intended for human consumption was simply mixed and used in other applications. However, both source and application requirements forced



suppliers into finer identification, segmentation and management of “recycled” water. For instance, the acceptable constituents of potable, or drinking water, are strictly regulated along with microbial content, taste and odor. Reclaimed water, on the other hand, has a variety of uses depending on the source and level of water reclamation. Certainly, water can be purified to a very high degree. However, higher levels of purification can be quite costly to achieve. In short, the more purified the water, the more expensive it is.

Consequently, the challenge for reclaimed water suppliers and their customers has been to match the level of water reclamation to the requirements of the water for a given application. This process is much more complicated than it initially appears, with many factors requiring consideration.

For example, as water is reclaimed, its level of salinity increases. This higher salt content can harm not only the soil and the fauna, but also the

irrigation equipment used to deliver this water. This has led to a major effort at separating water into various, yet potentially overlapping categories, such as reclaimed water, gray water, brackish water and run-off, just to name a few. Identifying water in this way helps suppliers and consumers

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better communicate water requirements and applications. Rain Bird has worked very closely with water suppliers, including the Irvine Ranch Water District in Irvine, California. The

company has also supported users of reclaimed water by offering valuable information about the options available for their specific applications, such as LEGOLAND® California, a family theme park in Carlsbad, California. Today, reclaimed water consumers are not only major golf courses with residential developments, but even municipalities who recognize the importance of conserving water through reclaimed water use.

Greater Understanding for Use of Reclaimed Water

Use of reclaimed water has numerous and obvious benefits. However, it also has numerous and very subtle challenges of which users need to be aware. Potable water has very strict requirements for consumption, while, in many areas of the world, the guidelines for reclaimed water use are not nearly as stringent. Furthermore, maximum constituent levels in drinking water may be constant at any point in time; in reclaimed water, these levels are averaged over a 24 hour period. This requires that users of reclaimed water have a deeper understanding of their water needs as well as the potentially harmful reclaimed water constituents that will be entering their facility on a daily basis. Under these guidelines, reclaimed water quality varies not only from day to day, but possibly from hour to hour.



Benefits of Reclaimed Water Use

When used wisely, reclaimed water offers the following benefits:

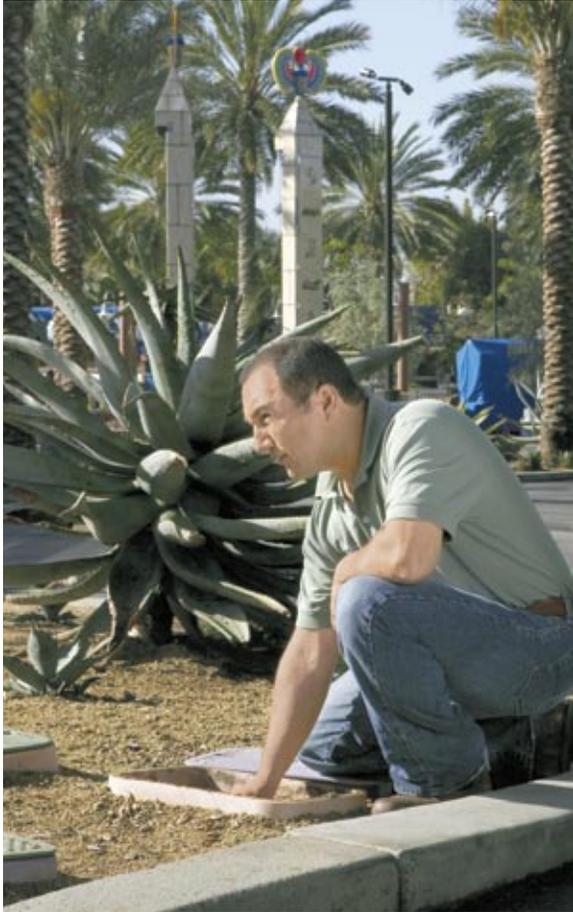
- Conservation of potable water resources.
- Decreased water use expenses.
- Greater independence from natural water cycles.
- A positive community image for organizations willing to take on the challenges of reclaimed water use.

As the demand for water increases and the availability of local and imported supplies is stretched to its limits, water reuse becomes an essential and cost-effective means of developing “new water.”

Challenges of Reclaimed Water Use

There are numerous challenges to utilizing reclaimed water that can vary from location to location, and even from season to season:

- Reclaimed water quality can vary from day to day, and even within a day.
- Often there are no strict reclaimed water specifications, only guidelines.
- Not all reclaimed waters may be suitable for every irrigating area based on the amount of time the area is frequented by humans and pets.
- Reclaimed water often contains constituents, such as salts, that can build up in a soil and cause challenges to grass and fauna growth. Greater soil management is often necessary.



- Unlike drinking water, where only minerals can build up in a water delivery and irrigation system, more constituents and even microorganisms can build up in reclaimed systems. Therefore, these systems must be monitored closely.
- Appropriate understanding of water reclamation extent is necessary in order to better understand where and how to use the reclaimed water. For instance, water reclamation from municipalities moves through various stages. Each stage provides greater reclamation, but also increases the cost of the

water. Therefore, optimum economic use of reclaimed water requires matching the level of water reclamation to the intended application.

The Rain Bird Commitment

Regardless of all the challenges that reclaimed water presents, its use is here to stay – both in the United States and throughout the world. Recycling water makes sense for a cleaner and greener environment. Rain Bird will remain steadfastly committed to developing irrigation system components that better withstand the effects of reclaimed water for more intelligent water management across the globe.

The Rain Bird Advantage

Rain Bird has a great deal of experience in working with our customers seeking to use reclaimed water for irrigation. Since each customer has unique needs, Rain Bird works closely with its customers to help them better understand the challenges and benefits of reclaimed water use for their particular applications. As the demand for water increases and the availability of local and imported supplies is stretched to its limits, water reuse becomes an essential and cost-effective means of developing “new water.” Promoting the use of reclaimed water is just one more example of how Rain Bird Corporation supports The Intelligent Use of Water.™

The Intelligent Use of Water.™

LEADERSHIP • EDUCATION • PARTNERSHIPS • PRODUCTS

At Rain Bird, we believe it is our responsibility to develop products and technologies that use water efficiently. Our commitment also extends to education, training and services for our industry and our communities.

The need to conserve water has never been greater. We want to do even more, and with your help, we can. Visit www.rainbird.com for more information about The Intelligent Use of Water.™



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