

HOT WATER

Depending on storm water in an arid setting

By Claire L. Zucker



Your average Tucsonan has a clear understanding that water is a scarce commodity in Arizona, one that needs to be used wisely and sparingly. Tucson receives approximately 12 in. of rain per year, much of it in flashy, very local, monsoon downpours, with the remainder in large dispersed winter storms. Between those times, it is dry—really dry. Most of the nation’s storm water management regulations, federal funding rules and perspectives on citizen engagement are generated in the wet part of the country and do not always translate well to the West. For example, arid regions often have receiving waters without actual water or associated water quality issues or total maximum daily load (TMDL) requirements. Also, many communities have separate storm sewers, and so may not have green streets mitigation projects that other areas gain as a consequence of combined sewer overflows and TMDL exceedances. Finally, citizens in dry regions often are deeply concerned about future water supplies, making them willing to personally invest in sustainable alternatives.

Tucson’s storm water generally arrives fast and furious, flowing down streets and surging into otherwise dry washes and rivers. Until the mid-2000s, storm water was viewed as a nuisance, not a resource. In the 1990s, storm water management focused on reducing pollutants through best management practices (BMP) under the NPDES regulations, or on keeping waterways free of debris or the river bank protected to ensure that storm water could exit the urban setting as quickly as possible. In the 2000s, the tables turned as many started to look at storm water’s value for outdoor landscaping to help green and

enhance the urban setting. These concepts were welcome in an area that already had embraced xeriscaping as a fundamental element of urban landscaping.

Greening Tucson

Over the years, governments and water providers played a vital role in promoting rainwater harvesting by first supporting low-water-use landscaping, then by developing more rigorous rainwater harvesting guidelines and ordinances. Municipalities embraced rainwater and storm water harvesting as a pollution prevention BMP, and as a water conservation and landscaping practice, and now are folding it into curb and right-of-way designs. Tucson’s 2013 Green Streets Policy and Active Practice Guidelines represent the latest step forward. This policy focuses on the use of street-transported storm flows to green the adjacent rights of way. City engineers, private practitioners, planners and staff worked together to develop green streets guidelines for all new streets and redevelopment projects that are publicly funded. The group identified the need for performance goals, project review teams and project reviews during both the design and the construction phases. This allows different perspectives to be considered and the green streets intent to continually be met.

Just a few of the region’s pivotal municipal accomplishments include:

- 1991: The Tucson Xeriscape Landscaping and Screening Regulations require low-water-use plants and limit the use of non-drought-tolerant plants;
- 2001: Pima County constructs Kino Environmental Restoration Project, which upgrades a detention basin to include environmental elements and

- storm water harvesting;
- 2001: The town of Marana Land Development Code: Landscape Requirements include requirements to implement low-water-use techniques and to landscape with drought-tolerant plants;
- 2003: The town of Sahuarita's General Plan Environmental Element promotes xeriscaping and water harvesting;
- 2005: The Tucson Water Harvesting Guidance Manual provides rainwater harvesting and construction designs;
- 2007 through 2012: Rainwater harvesting is installed at city ward offices that act as demonstration sites;
- 2008: The Tucson Commercial Rainwater Harvesting Ordinance requires new commercial developments to incorporate rainwater harvesting;
- 2010: The town of Oro Valley Landscape Conservation Code requires rainwater harvesting for new commercial developments;

- 2012: The Tucson Water Department conducts rainwater harvesting workshops as part of a rebate program;
- 2013: The Tucson Green Streets Policy-Active Practice Guidelines are developed with a broad range of professional input; and
- 2013 (expected): The Pima County Detention and Retention Manual update requires the use of green infrastructure (GI)/low impact development (LID) to retain first flush and allows design of GI/LID projects for flood control detention.

Local Experiments

Municipalities were spurred to explore storm water/rainwater/landscaping requirements, not only due to environmental mitigation requirements, but also because using storm water for urban landscaping offers tangible quality-of-life improvements in an arid environment. This important link between rainwater/storm water harvesting and streetscape

improvements was inspired, in large part, by citizen leaders.

Dryland water harvesting methodologies first were explored locally by Tucson Audubon Society staff as it conducted channel encroachment in lieu of mitigation as required under 404 permitting. Later, an Audubon practitioner, Brad Lancaster, wrote a landmark book, "Rainwater Harvesting for Drylands," which explains how to build successful dryland projects and brought international attention to the area's achievements. More recently, Watershed Management Group (WGM), a local nonprofit, created a hands-on community-based approach to harvesting projects and expanded that effort by working with municipalities to create policies and design criteria that promote green infrastructure. The University of Arizona, WGM and the Sonoran Institute developed "Conserve 2 Enhance," an innovative program that



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allows people to donate money saved through water conservation to riparian restoration projects. In each case, enthusiastic individuals worked to bring rainwater harvesting to their neighborhoods, streetscapes and yards, and to value and use storm water rather than urge its quick exit from the city.

Many Tucsonans are captivated by the idea of catching and using rainwater. They also are "water smart," in part because the community has been educating, incentivizing and pricing water to promote conservation for almost 30 years. Personal rainwater use has become even more appealing because citizens often find it difficult to understand, influence or impact major water decisions. In Tucson, managing water responsibly resulted in developing complex water evaluation and trading agreements. Tucson imports water via the Central Arizona Project from the Colorado River, more than 300 miles away, and as a result, has

reduced groundwater pumping dramatically. Water resources also are stretched because the reclaimed system provides water to more than half of the area golf courses, numerous turf areas and even to some riparian areas. There also are private and public water companies, state Assured Water Supply rules, federal Indian water rights agreements and interstate water banking agreements to deal with.

While aggressive water management systems safeguard potable supplies, they do very little to ensure that water will be available to support riparian areas or to keep properties vegetated. For an arid region facing significantly higher temperatures and likely reduced water availability over the next few decades, the concept of managing storm water by emphasizing water resource utilization brings opportunities to enhance and sustain the community. The future economic viability is greatly enhanced by the tourism associated with the watchable

wildlife industry and the beauty of the physical setting, but urban heat island effects threaten to make the metropolitan core increasingly inhospitable over time. Canopy cover in eastern Pima County is just 7%, compared with the national average of more than 30%. As traditional water resources shrink, shade and green cover will only decrease over time unless we take action. Innovative solutions are needed to maintain and improve our quality of life, and, right now, rainwater and storm water management appear to be the best bet. **SWS**

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