

ONE WATER WIMBERLEY REGENERATIVE DEVELOPMENT FOR WISD

“Connected by Living Waters”

WIMBERLEY VALLEY WATERSHED ASSOCIATION

MEADOWS CENTER FOR WATER AND THE
ENVIRONMENT

VENHUIZEN WATER WORKS

THE REGEN GUILD

November 5, 2018

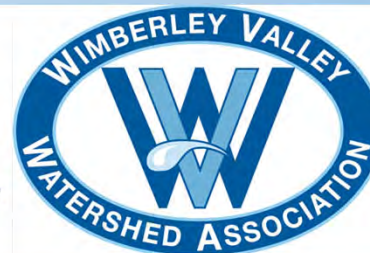


CYPRESS
CREEK

Let's keep it clean, clear & flowing



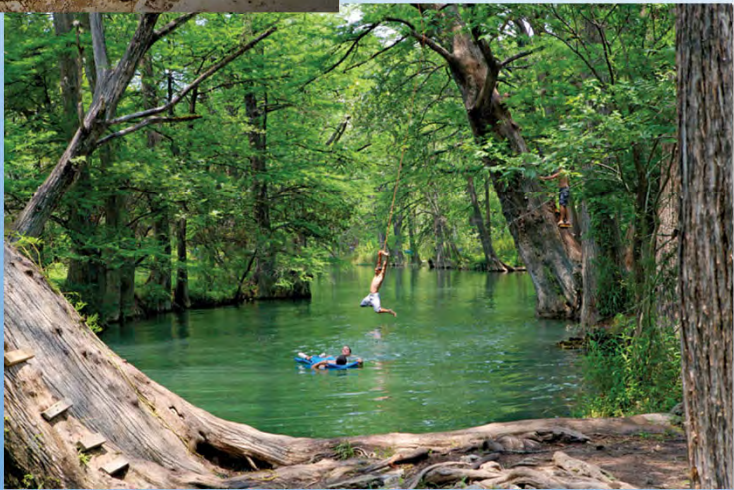
THE MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY



Objectives for Today

1. Feedback from last meeting
2. Share Regenerative Development Perspective
3. Introduce One Water Approach for Wimberley
4. Review Rainwater & AC Condensate Harvesting for Toilet Flush Supply
5. Review Low Impact Development and Green Infrastructure
6. Review Onsite Wastewater Reuse
7. Discuss How We Collaborate as a Team Going Forward

Connected by Water



Slide 3

- 1 This could also be a picture montage of the various ways in which the ISD could lead around water - lots of pictures of kids
Diane Miller, 11/1/2018

Cypress Creek: The Lifeblood of Wimberley



June 2008



June 2011

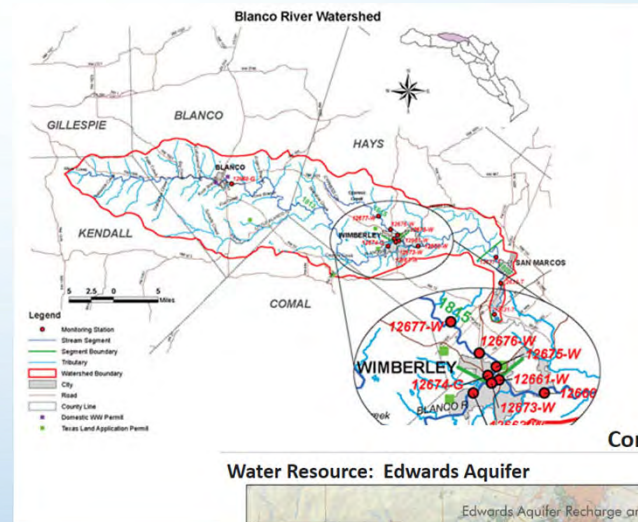
Slide 4

- 2 are there any stats about Blue Hole we can add or Wimberley water issues overall?
Diane Miller, 11/1/2018

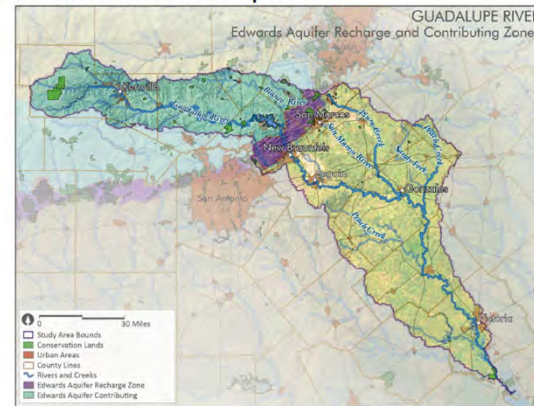
Healthy Watersheds = Healthy Wimberley

The New School Campus is Nested within Blanco/Guadalupe

Watershed



Water Resource: Edwards Aquifer



Conservation Resources

Cypress Creek Project Partners

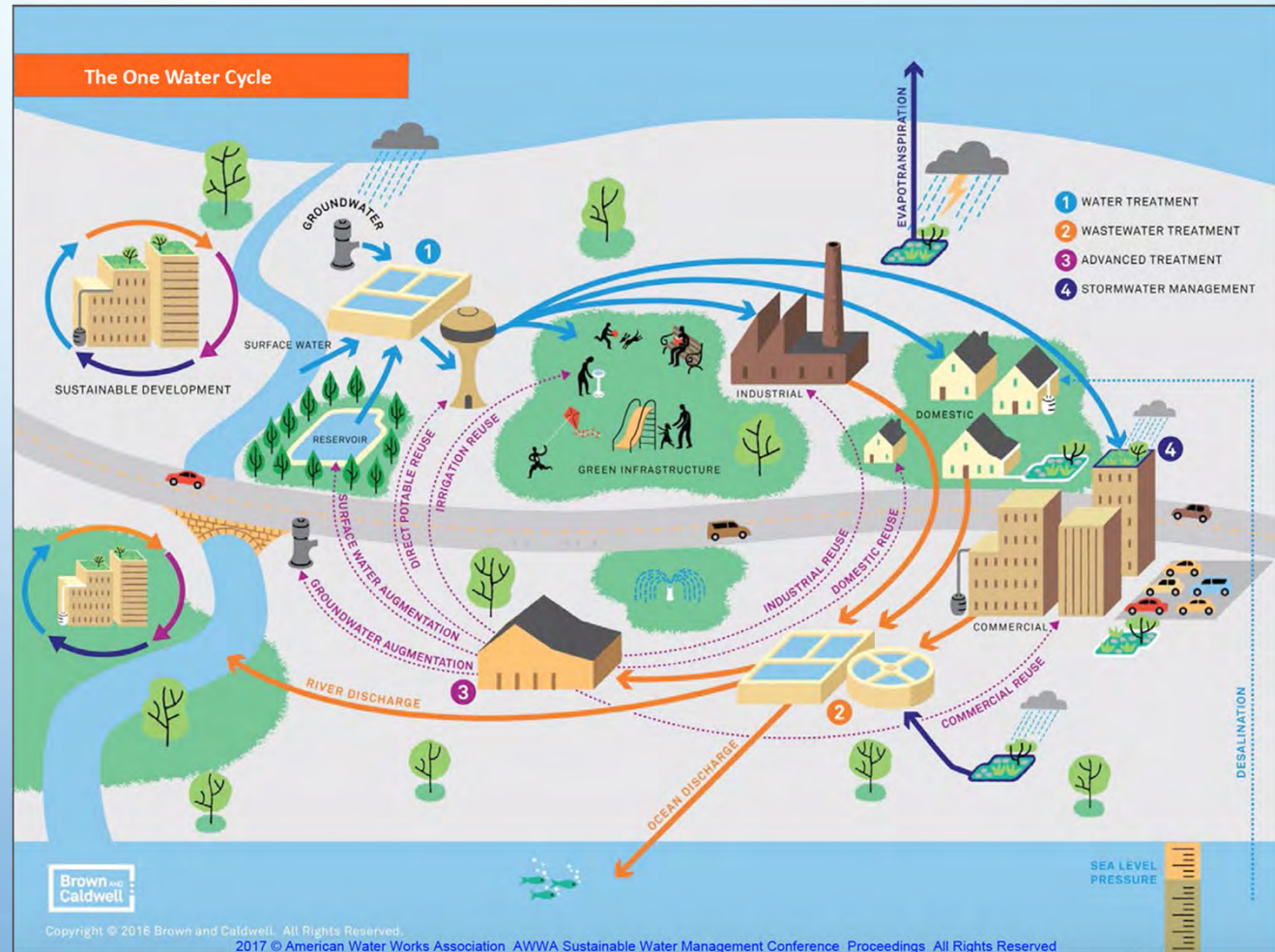


The Opportunity - Amazing Potential

- WISD AS LEADER FOR WATER STEWARDSHIP
 - Culmination of 10 year Cypress Creek Watershed Protection Plan effort to keep Cypress Creek clean, clear and flowing.
 - Creating a watershed culture in the Wimberley Valley
- NEW SCHOOL SITE AS CATALYST
 - Place-sourced education on this critical site near Jacob's Well and Blue Hole
 - A Living Lab for integrated water management.
- SERVING OUR COMMON FUTURE
 - Sense of belonging to the watershed
 - Healthier and smarter kids
 - Committed community partners and stakeholders



One Water: Valuing water at every phase of the water cycle



Regenerative Development Principles



WORKING IN WHOLES RATHER THAN PARTS

- Recognizing that the world works as systems of nested wholes helps us see interconnections and mutually beneficial contributions.



BEING OF SERVICE

- Being indispensable to a larger whole helps all parts of a system ensure long-term viability.



ACCOUNT FOR UNIQUENESS

- Reflecting, celebrating and enhancing the unique qualities and patterns of a place.



FROM SEPARATE TO ALIGNED WITH NATURE

- Appreciating our intimate relationship with natural systems and finding new opportunities to be positive contributors to these systems.



FROM PROBLEMS TO POTENTIAL

- Shifting our focus to realizing potential and increase vitality and viability at every turn.

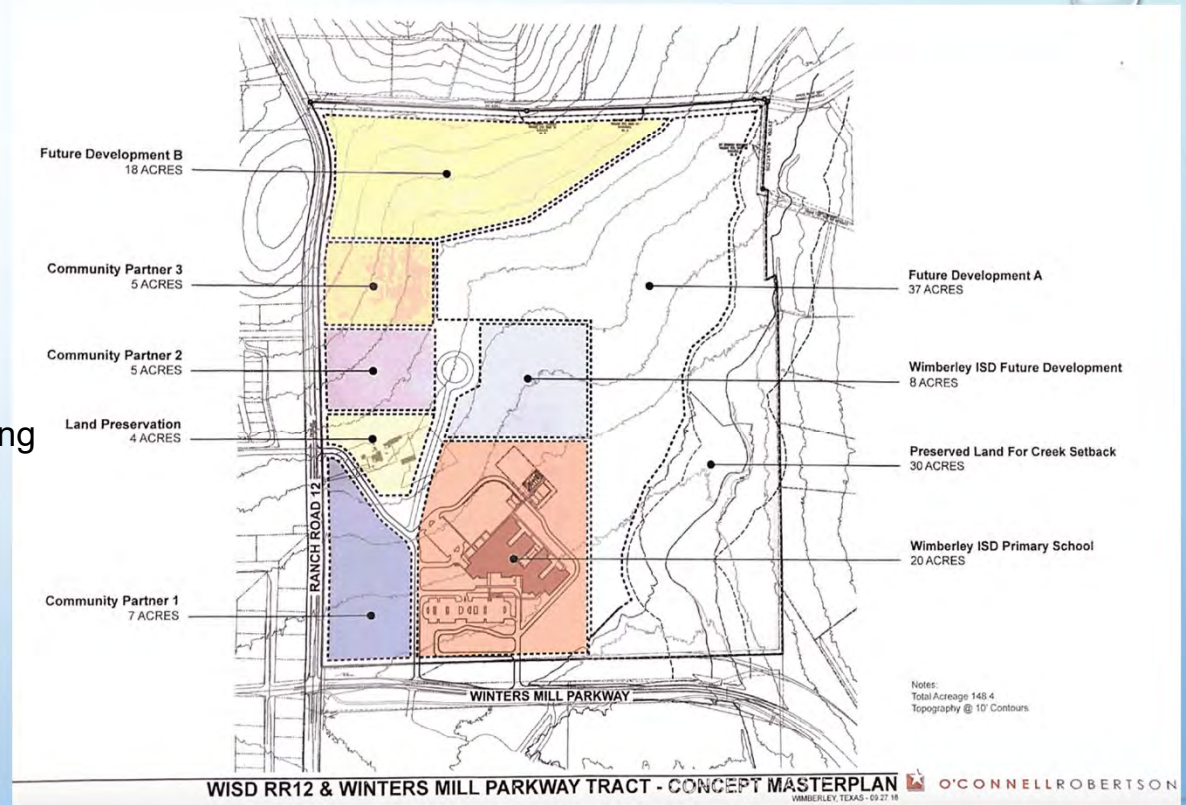
A Phased Approach

PHASE 1:

- Elementary School 20 acre site

PHASE 2 :

- Develop a vision for the 148 acre site
 - Continue to Engage the Community in Planning
 - Conservation Restoration Plan
 - Connectivity to Regional Resources



One Water: Valuing water at every phase of the water cycle

- **STORMWATER MANAGEMENT**
 - EQUIVALENT TO AN UNDEVELOPED SITE WITH NO IMPERVIOUS COVER
 - PROTECT WATER QUALITY
 - CONSERVE WATER QUANTITY
- **WATER CAPTURE AND RE-USE**
 - ON SITE WW TREATMENT → LANDSCAPE IRRIGATION
 - AC CONDENSATE + RAINWATER HARVESTING → TOILET FLUSHING
- **CONSERVATION**
 - LOW FLOW FIXTURES
 - NATIVE AND ADAPTED WATER-WISE LANDSCAPING & SITE REGENERATION

STORMWATER MANAGEMENT

- PROTECT WATER QUALITY
- CONSERVE WATER QUANTITY



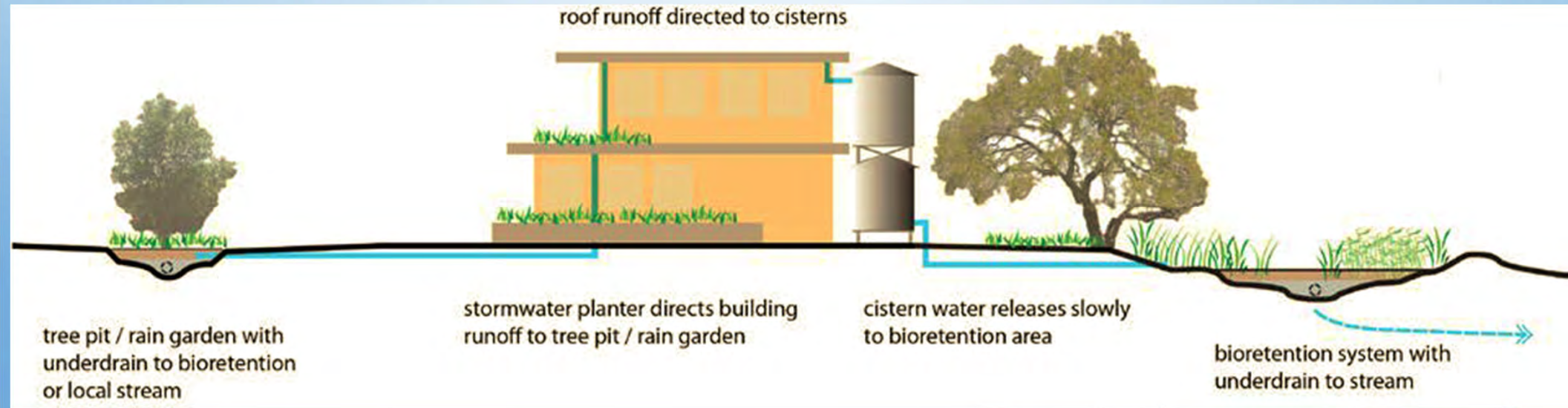
roof runoff directed to cisterns

tree pit / rain garden with underdrain to bioretention or local stream

stormwater planter directs building runoff to tree pit / rain garden

cistern water releases slowly to bioretention area

bioretention system with underdrain to stream



Onsite Wastewater Reuse

- RECIRCULATING PACKED-BED FILTER SYSTEM
- FIRST COST SAVINGS - \$500,000
- POTENTIAL SAVINGS VS CONVENTIONAL SYSTEM
 - OVER 30 YEARS ANNUALLY \$20,000-\$30,000
- CASE STUDY – ORENCO SCHOOL - ADVANTEX

CUSTOM SOLUTIONS FOR
Schools & Churches

Orenco[®]
SYSTEMS

Wastewater Solutions

Affordable Wastewater Treatment Solutions from Orenco Systems[®] Inc.

Schools and churches pose a challenge for engineers of decentralized wastewater systems because of their unique design considerations (see sidebar). Orenco's AdvanTex[®] Treatment Systems are ideal for schools and churches, and Orenco's wastewater equipment has been installed in more than 200 schools and churches throughout North America, as well as in Africa, New Zealand, and the Caribbean. In fact, an AdvanTex Treatment System for a school in Warren, Vermont, was honored with a 2001 "Engineering Grand Award for Water Resource Projects" by the American Consulting Engineers Council.



Orenco's AdvanTex[®] Wastewater Treatment System was installed at the Andriada Politechnico Palano High school campus near Tucson. (Story on back)

Wapsie Valley High School, Iowa

Excellent treatment despite variable flows

Wapsie Valley High School had surfacing wastewater flowing over the school's parking lot from a failed, 45-year-old drainfield. Wildly varying flows and site constraints posed additional problems. During the school year, wastewater flows averaged 5,000 gpd (18.9 m³/day), and big events strained the system's capacity to a peak of 13,000 gpd (49.2 m³/day). During the summer, however, flows dwindled to almost nothing. Most wastewater treatment technologies perform poorly under these conditions.

After evaluating the situation, the project engineer, Gary J. Solberg, P.E., chose an AdvanTex Treatment System manufactured by Orenco, for its ability to handle variable flows, as well as for its relatively low energy consumption and ease of installation/operation. Once the AdvanTex system was installed, the consistently high quality of the effluent took the strain off the existing drainfield, which was rehabilitated and placed back into service. Sampling showed that the system's effluent BOD₅, TSS, and NH₄-N were averaging less than 10 mg/L, 10 mg/L, and 5 mg/L, respectively.*

* Samples collected between 1-13-06 and 5-10-06

Design Considerations for SCHOOLS & CHURCHES

Because of their intermittent usage, schools and churches require the ability to start up quickly and handle highly variable flows, both weekly and seasonally. These facilities also require the ability to handle varying waste strengths. For example, schools with kitchens and showers vary significantly from those without.

AdvanTex[®] Treatment Systems use a multi-pass, packed-bed filter treatment technology that is well suited for these applications, especially in conjunction with equalization tankage (which also allows for downsizing of the treatment facility). AdvanTex offers increased process stability and more consistent effluent quality than conventional activated sludge systems, which are difficult to operate part-time with highly variable flows and waste strengths. Consequently, depending on local regulations, AdvanTex effluent can be reused for irrigation.

For a copy of Orenco's [AdvanTex Design Criteria](#), call 800-348-9843 or +1-541-459-4449.

WATER CAPTURE AND RE-USE

RAINWATER HARVESTING & AC CONDENSATE SYSTEM

- ESTIMATED COST SAVINGS \$9000-\$17,000 ANNUALLY
- = 99% OF ALL TOILET FLUSHING



Benefits: Bringing It All Together

- FOR WISD:
 - Reduced capital and operating costs
 - Establish leadership in the community on a flagship site
- FOR THE COMMUNITY
 - A catalyst for creating a watershed culture
 - A Living Lab for integrated water management and innovation
- FOR THE CHILDREN
 - Healthier and smarter kids
 - Engaging and Inspirational Learning Experience



Where does this lead us?



Future Vision Living Machine

COLLECT → TREAT → RE-USE → TEACH



THE Sustainable SITES Initiative

For Sustainable Land Design and Development



SITES GUIDING PRINCIPLES

These principles informed the development of specific and measurable criteria for site sustainability, and can also be applied to the land design and development process.

Do no harm.

Make no changes to the site that will degrade the surrounding environment. Promote sustainable design projects on sites where previous disturbance or development presents an opportunity to regenerate ecosystem services through sustainable design.

Apply the precautionary principle.

Be cautious in making decisions that could threaten human and environmental health. Some actions can cause irreversible damage. Examine a full range of alternatives (including no action), and be open to contributions from all potentially affected parties.

Design with nature and culture.

Create and implement designs that are responsive to economic, environmental, and cultural conditions and to the local, regional, and global context.

Use a decision-making hierarchy of preservation, conservation, and regeneration.

Maximize the benefit of ecosystem services by preserving existing environmental features, conserving resources in a sustainable manner, and regenerating lost or damaged ecosystem services.

Provide regenerative systems as intergenerational equity.

Provide future generations with a sustainable environment supported by regenerative systems and endowed with regenerative resources.

Support a living process.

Continuously re-evaluate assumptions and values, and adapt to demographic and environmental change.

Use a systems thinking approach.

Understand and value the relationships in an ecosystem. Use an approach that reflects and sustains ecosystem services and re-establishes the integral and essential relationship between natural processes and human activity.

Use a collaborative and ethical approach.

Encourage direct and open communication among colleagues, clients, manufacturers, and users to link long-term sustainability with ethical responsibility.

Maintain integrity in leadership and research.

Implement transparent and participatory leadership; develop research with technical rigor; and communicate new findings in a clear, consistent, and timely manner.

Foster environmental stewardship.

In all aspects of land development and management, foster an ethic of environmental stewardship—an understanding that responsible management of healthy ecosystems improves the quality of life for present and future generations.