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Buildings and water collection infrastructure are seen at Shield Ranch, where rainwater is collected, treated and distributed through one of Texas' first publicly approved rainwater-fed public water systems with distribution infrastructure. (Spectrum News 1/Agustin Garfias)

WATER

Central Texas ranch pioneers one of state's first public rainwater systems

BY AGUSTIN GARFIAS | TEXAS

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TRAVIS COUNTY, Texas — When storms roll across Shield Ranch in western Travis County, rainwater rushing off rooftops does not go to waste. Instead, it is collected, filtered, disinfected and distributed back out across the property as drinking water through a public water system designed around rainwater

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“We were 3 1/2 miles from the nearest municipal water source, so that really wasn’t an option for us,” said Blake Murden. “Groundwater in this area is just really not that reliable. We know that the aquifer is struggling.”

Murden said the system was designed around four main components: collection, storage, treatment and distribution. Rainwater falls onto roughly 7,300 square feet of rooftop collection area before flowing through screened gutters into storage tanks capable of holding more than 67,000 gallons of water.

From there, the water moves through multiple filtration stages designed to remove sediment and pathogens before chlorine is added for disinfection. The treated water is then distributed through pressurized pipes to sinks, kitchens and restroom facilities across the property.

Murden said the system is continuously monitored through a supervisory control and data acquisition, or SCADA, system that tracks water quality indicators such as turbidity, pH levels and chlorine residuals. A licensed water operator also visits the site daily to inspect equipment and conduct additional testing.

The ranch pairs the rainwater system with water conservation measures intended to reduce overall demand. The property uses waterless evaporative toilets, metered faucets and native landscaping that does not rely on irrigation.

“The average Texan uses about 87 gallons of water per person per day,” Murden said. “Our campers, through education and water conservation, use about 12 and a half gallons a day.”

The project required coordination with the Texas Commission on Environmental Quality (TCEQ) because rainwater is not currently recognized as a standardized public water source under existing Texas drinking water regulations.

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onsite rainwater system itself has enough capture area, storage, treatment and delivery capacity to serve customers reliably.”

TCEQ said Texas has approved other rainwater harvesting systems in the past, but additional review is required because rainwater systems do not fall under traditional groundwater or surface water classifications used in state regulations.

Under Texas law, a public water system is defined as one that has at least 15 service connections or serves at least 25 people at least 60 days each year. Shield Ranch is classified as a transient, non-community public water system, according to TCEQ.

Brian Hunt, a geologist with the University of Texas Bureau of Economic Geology, said projects like Shield Ranch could become part of a broader strategy to address Texas’ growing water demands.

“Diversification is needed,” Hunt said. “We still need our surface water reservoirs. We still need groundwater. But just having a diverse portfolio to try and get us through these really tough times.”

Hunt said concerns about rainwater harvesting reducing groundwater recharge are likely difficult to measure at the scale of most projects. He said broader adoption of rainwater harvesting might reduce reliance on groundwater pumping and surface water reservoirs if paired with conservation efforts.

“It’s going to take really everything,” Hunt said. “Conservation is going to have to be integral to that.”

Texas lawmakers and water planners have increasingly focused on long-term water supply challenges as the state continues to grow and experience recurring drought conditions. According to the Texas Water Development Board, the state's population is expected to continue rising in the coming decades, increasing pressure on existing water supplies.

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