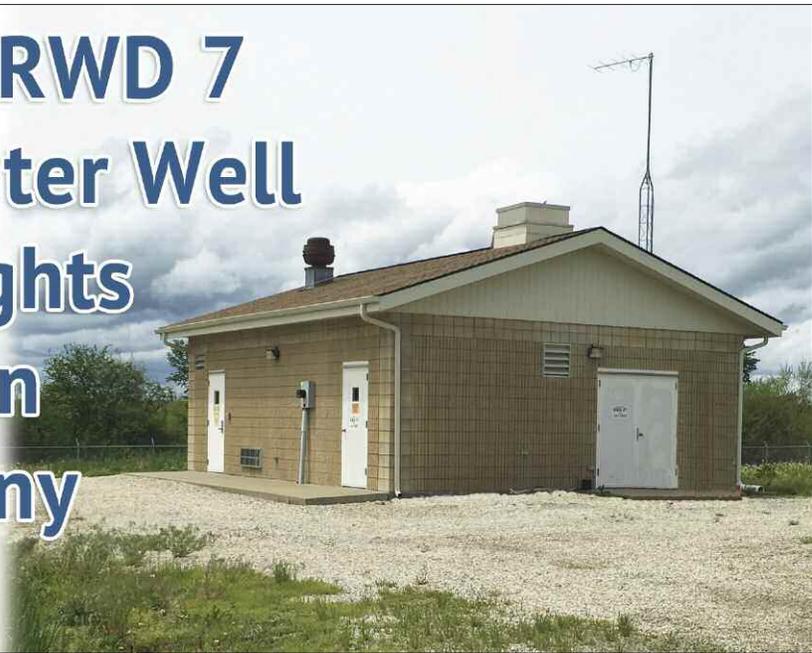


Leavenworth RWD 7 Purchases Water Well and Water Rights from Suburban Water Company



There have been a number of milestones that Rural Water District No. 7, Leavenworth County has achieved through the years. None may be bigger than the one that was accomplished earlier this year.

The district boundaries encompass approximately 31 square miles in southeast Leavenworth County. The area is generally south of the Kansas Turnpike, north of the Kansas River, west of Bonner Springs and east of Linwood. Approximately two square miles of southwest Wyandotte County is also in the district.

The establishment of Leavenworth RWD 7 was approved by the Leavenworth County Commission on September 7, 1964. For the first 35 years or so, water distributed by the district was supplied by the city of Bonner Springs. In 1999, the district

This is the wellhouse for Leavenworth RWD 7's Well No. 1. Well No. 3, which replaced Well No. 1 in 2016, is located behind the building.

decided to produce some of their own water from two different sources. The first water right application was for a location in the northern part of the district where it was believed that a buried glacial valley filled with sand and gravel could be located. They also decided to drill a well in the alluvium of the Kansas River valley, known for having ample supply, but often challenging water quality, as compared to glacial aquifers. In December 2000, the applications to develop water rights from the two new proposed wells were approved. Both wells were authorized to divert up to 104.270 million gallons per year (MGY) at a rate not in excess of 400 gallons per minute (GPM) each. The total quantity was further limited to 195.510 MGY.

The glacial aquifer well (Well No. 1) was drilled by Clarke Well & Equipment in December 2002 to a depth of 73 feet. In April of 2016, this well was replaced with a deeper well (Well No. 3) by

Brotcke Well & Pump. The depth of the new well is 84 feet. The Kansas River, or Kaw Valley, well (Well No. 2) was also drilled by Clarke Well to a depth of 53 feet. This well was completed on the day after Christmas in 2002.

In early 2005, nitrate concentration approached the maximum contaminant level (mcl) and the decision was made to adopt a wellhead protection plan to attempt to control this potential problem. No specific location was identified as the probable source of the elevated nitrate levels during the assessment phase of the plan development, although there were numerous rural residences with septic systems, farmsteads and cultivated fields that all could have contributed to the total concentrations observed. A plan developed by Kansas Rural Water Association recognizing these threats was adopted later that summer.

District Manager David Rinaldi was not satisfied with the plan only addressing probable causes of the elevated nitrates. His curiosity and determination to understand the problem was perfect for master degree level research. Margaret Townsend of

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the Kansas Geological Survey agreed to provide assistance to this project and by recording water level measurements and finding water well drilling logs, they were able to create a groundwater model showing the likely contaminant flow path. Nitrogen-15 isotope analysis of the nitrate was used to find that the nitrate had a biological source and not a fertilizer source. Using the flow predictions of the model, a former dairy farm was found to be the likely source of the nitrate. Because the dairy farm no longer has cattle, and observed nitrate levels have been decreasing with time, the problem appears to be much less significant than initially suspected. With the study results, Ms. Townsend was able to write a report in 2008 outlining her findings titled Use of the Nitrogen-15 Natural Abundance Method to Identify Potential Sources of Nitrate-N Contamination in Ground Water Utilized by Rural Water District #7, Leavenworth County, Kansas (http://www.kgs.ku.edu/Hydro/Publications/2008/OFR08_31/). David Rinaldi successfully earned a Master of Science degree from the University of Missouri - Kansas City by evaluating

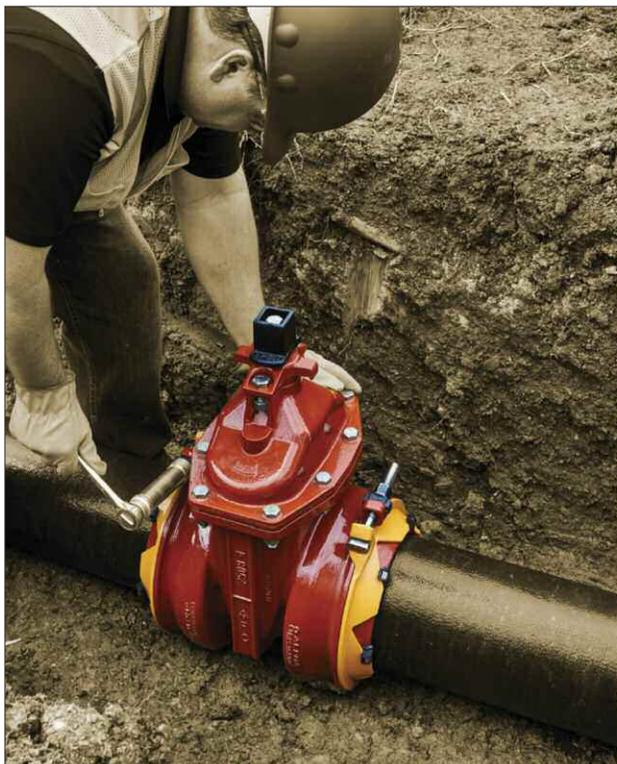
the impact that residential rural development near groundwater recharge areas has on pollution potential and groundwater recharge rates, using geographic information systems (GIS) to create an assessment procedure.

Off and on, over the years, informal requests to purchase the groundwater wells and chlorination system of Suburban Water Company of Basehor, Kansas, were made. The Suburban infrastructure is located less than 200 feet from the common service area boundary of the two water systems. Usually, the selling price that was

informally offered was in the millions of dollars. Serious negotiations were never held as there was very little urgency to accomplish the transfer. That was until 2018.

Back in 2006, Suburban Water Company filed a complaint with the Division of Water Resources that Leavenworth RWD 7 was impairing their previously established appropriations of water. Actual direct impairment was never established, at least to the point that Leavenworth RWD 7 had to reduce or suspend water diversions. Speculation is that since self-produced groundwater is cheaper than the water purchased from their other suppliers of water (in this case, Kansas City's Board of Public Utilities (BPU)), Suburban was pumping its wells 24 hours a day at the highest rate the aquifer could sustain. Eventually, this sustainable rate was down to 100 gallons per minute. In 2017, Suburban replaced the numerous water wells in this wellfield with a new single well drilled a depth of 96 feet, in an attempt to capture more water. In 2018, this single well with three water right permits authorizing 390 gallons per

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The customers of Leavenworth RWD 7 will be better served by their district when the new district office and shop building in Bonner Springs is completed later in 2019.

minute was only able to produce approximately 120 gallons per minute. The decline in the static water level at the Leavenworth RWD 7 well approximately 3,000 feet away was

eight feet, causing a 40 percent decrease in production capacity.

To prove the theory that it is more economical for a water system to develop its own water source and

produce its own water, Suburban Water Company decided to develop their own Kaw Valley wellfield. In late 2014 and early 2016, Suburban Water Company filed applications to develop water rights southwest of Linwood, Kansas. Both of these applications have been approved for 651.700 MGY at rates of diversion of 2,000 GPM each, limited to a total of 786.800 MGY when combined. The approvals were granted April of 2015 and December of 2016. As of May 16, 2019, the notices of completion for the wells and the installation of the required equipment like meters, water level measurement devices, etc., have not been submitted to the Division of Water Resources. Confidence in these new wells obviously remains high, as Suburban and Leavenworth RWD 7 entered into serious negotiations in 2018.

On October 7, 2018, the building housing Leavenworth RWD 7's connection to the city of Bonner Springs was destroyed when natural gas inside the building exploded. While the building did not have any connection to the nearby natural gas distribution system, escaped natural gas seeped underground until it was able to enter through an electrical conduit below the ground surface. It is believed that the gas escaped through a broken fusion of high-density polyethylene (HDPE) gas pipeline segments. Testing of this HDPE pipe to determine the exact reason for its breakage is not complete. Kansas Rural Water Association reported this event in the October 15, 2018, Weekly News (<https://www.krwa.net/enews>).

With Suburban having permits to establish two wells capable of pumping groundwater at a rate of diversion more than ten times greater than their existing glacial aquifer well, and with the geographic convenience for Leavenworth RWD 7 of Suburban's new glacial aquifer well and the receipt of a cash settlement for the destroyed interconnection building, both parties were ready to negotiate. They came to agreement and decided to transfer the assets on January 31, 2019. For \$300,000 at closing, and seven

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Suburban Well No. 13 was drilled in February of 2018 by Sargent Drilling, to replace a battery of shallower wells. This well and its water rights were purchased by Leavenworth RWD 7 in 2019.

additional annual payments of approximately \$46,429 with no interest, Leavenworth RWD 7 purchased Suburban Water Company Well No. 13, the chlorination building at Well No. 13, and three water rights (one certified, two in perfection) for a total of \$625,000.

Prior to closing the sale, Suburban Water Company suspended the use of its Well No. 13 in October 2018. In May 2019, the static water level at Leavenworth RWD 7's well has recovered five feet from the eight feet that was lost.

Leavenworth RWD 7 is also building a new office building on the outskirts of Bonner Springs. Their long-time office in downtown Bonner Springs was flooded last year by failed plumbing in an upstairs apartment above their rented storefront. Since then, they have been housed in the basement of a house converted into an insurance agency. While the staff has been excited about the expansion of the water supply infrastructure, they will be very happy when they get a modern office with windows and walls that can be decorated with framed pictures. Congratulations to Rural Water District No. 7, Leavenworth County on facing the disasters that came their way and seeing them as the opportunities that they really were.

Douglas S. Helmke has been the Water Rights Tech at KRWA since June 2000, and also a Wellhead / Sourcewater Protection Tech since 2003. He holds professional geologist certification in Kansas and Missouri. Doug received a bachelor degree in geology from Kansas State University.







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