

Larned Water – capacity & infrastructure enhancement

Larned takes its place in history noted for historic Fort Larned and the Santa Fe Trail. The Santa Fe Trail was a 900-mile long route that was envisioned in 1821 by William Becknell. Becknell and a party of five men loaded merchandise on ox-drawn wagons in Franklin, Missouri and headed on a journey that ended in present day Santa Fe, New Mexico. This same route was used for more than 50 years to transport trade goods across a five-state area. In Kansas the trail began in the Kansas City area and ran southwest past Council Grove, Fort Zarah, near Great Bend, Pawnee Rock, Fort Larned and Fort Dodge. During the 1800s Kansas was home to more than 50 forts filled with soldiers charged with protecting commerce, migrating travelers and early Kansas settlers. Today Fort Larned is one of only seven surviving Kansas forts that are open to the public.

Jon Steele
Tech Assistant



With nine restored buildings, it survives as one of the best examples of Indian Wars period forts and is a National Historic Site administered by the National Park Service.

The city of Larned looks a lot different than it did in the 1800s. The wild west of covered wagons, the local blacksmith shop and buffalo grazing from horizon to horizon gave way to the industrial revolution, electricity, irrigation and automobiles. Irrigation, cattle feeding, Larned State Hospital, all have supplemented dry-land wheat

The City of Larned looks a lot different than it did in the 1800s. The wild west of covered wagons, the local blacksmith shop and buffalo grazing from horizon to horizon gave way to the industrial revolution, electricity, irrigation and automobiles.

farming to build an economy that has evolved into Pawnee County's Larned of today.

Quality water heritage

Richard Lewis helped bring 20th Century water quality standards to Larned and was supervisor in charge of the water department when I first started calling on the city as Circuit Rider for KRWA. Richard was a stickler

for getting things done right. This attitude is alive and well, carried on today by all who worked with him in the Larned water department. I always admired Richard and his commitment to quality; he was also a friend. One of his last accomplishments before retirement was to complete installation of a computerized radio telemetry system that replaced an old pressure switch



Inside the pump house for Well #3, Larned Water Superintendent Robert Barker adjusts variable frequency drive controllers. There's ample space in this building – a welcome change to many well houses. The drive unit is a 100 hp motor.

model. Richard retired in 2001 and passed away two years later in 2003. He will be long remembered and sorely missed by co-workers, family, friends and neighbors in the Larned community.

near Larned, has the same concern for excellence that Richard had. I am always impressed with the efforts and accomplishments Larned workers have for providing the community with a first class

feet of new six-inch and eight-inch main that replaced the aging sand-cast pipe in the downtown area. The crews have been busy replacing or installing 11 new fire hydrants and 37 new valves. A



Both these pump houses were constructed by Larned city workers. The structure on the left houses Well #3; the brown stone building on the right houses equipment that pumps water to Larned State Hospital, three miles west of Larned.

Robert Barker, one of Richard's past employees, has moved up to fill Richard's position as water supervisor for the city. Robert, who grew up on a farm

water department. Recent accomplishments include a new well-house; complete new plumbing and well overhaul for Larned City Well #3; and 5000

major project went on line recently that upgraded service for getting water to Larned State Hospital. It included installation of three miles of new 10-inch line

FLUID EQUIPMENT

CHEMICAL FEED

CLARIFICATION

DISINFECTION

FILTRATION

HEADWORKS

PROCESS

SCADA

SOLIDS

Water and Wastewater SOLUTIONS

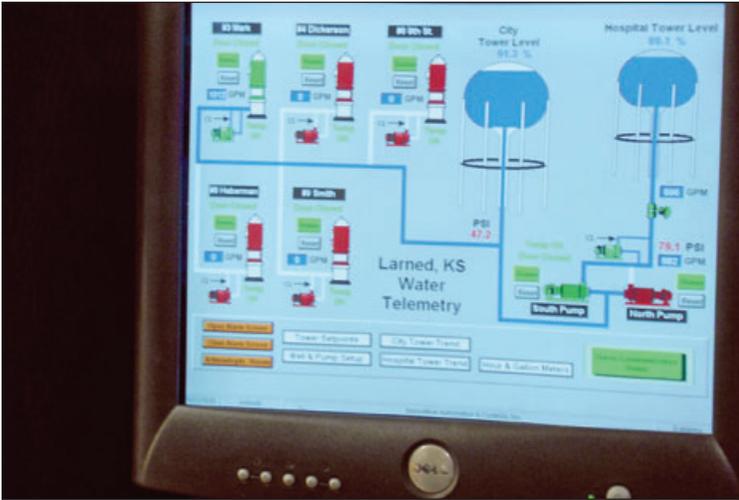
WWW.FLUIDEQUIP.COM

Western MO & Northeast KS

4225 NE Port Drive
Suite 200
Lee's Summit, MO 64081
816.795.8511

Kansas & Oklahoma

3500 North Rock Rd.
Building 100
Wichita, KS 67226
316.630.0075



This display of the telemetry system monitors and controls Larned's water system operations.

with four hydrants, seven valves and a new pump station.

Pump house bargain at \$10,000

The new pump house is especially impressive and was constructed entirely by city employees. The old building had served its time and was in dire need of replacement – too small to properly plumb the master meter

to meet today's standards. Robert decided that they could do it themselves and save a lot of money over bidding it out. The pump house was constructed with block filled with concrete and included a concrete roof at a total cost of only \$10,000. The department takes

a lot of kidding about the building having great potential as a bomb shelter. All jokes aside, masonry construction like this is the preferred design when it comes to a pump or well house. Having seen plenty of rotted wood and rusted metal buildings used as well houses and pump stations, I'd say this building will last a lifetime. The new facility is also roomy which makes it nice if the need arises to work on anything inside. The interior measures 13

feet x 19 feet, which is ample room to properly plumb the water meter with the required amount of straight pipe on both sides of the meter. I advise that regardless of the structure to be built, design enough space to comfortably work inside and allow for 10 pipe diameters of straight pipe upstream and five diameters of straight pipe downstream of the meter. Having that amount of space will meet any foreseeable standards.

Well rehab

The City refurbished and thoroughly cleaned Well #3, installing a new 100 hp motor with rebuilt pump. Layne Western provided the service on the well. A Yaskawa VFD drive and a pressure transducer were installed to enable the city to run without the tower when needed. A smart-valve was installed to allow the chlorinator to adjust with demand based on flow. Security alarms and pressure alarms were integrated into the telemetry system. The city financed the project from reserve funds and bond proceeds.

Main enhancement, downtown

The downtown pipeline project was completed to replace aging cast iron mains and to loop lines for better water flow. As mentioned earlier, a total of 5000 feet of four-inch and six-inch mains were replaced with six and eight-inch C-900 PVC. Six hundred feet was bored to avoid the mess of open cutting the historic brick streets downtown. Schwab-Eaton, P.A. of Manhattan, Kan. was the project consultant. Shears Construction was the contractor and the city served as its own inspector, making all the service taps.

Larned water heads west

Supplying Larned State Hospital with water was a sizeable

py **PONZER-YOUNGQUIST**
Consulting Engineers & Land Surveyors

ENGINEERING SOLUTIONS FOR KANSAS COMMUNITIES SINCE 1973

- ❶ **WATER**
Supply-Treatment-Storage-Distribution
- ❷ **WASTEWATER**
Collection-Pumping-Treatment
- ❸ **STREETS**
Residential-Collector-Commercial-Asphalt-Concrete
- ❹ **STORMWATER**
Collection-Open Channel-Piping-Structures
- ❺ **DEVELOPMENT**
Planning-Platting-Utilities
- ❻ **SURVEYING**
Boundary-Topographic-Alta

227 E Dennis • Olathe, KS 66061 • PH 913-782-0541 • FAX 913-782-0109
 Visit us on line at www.pyengineers.com

and necessary project, even though the hospital has always had its own wells, water tower and distribution system. A nitrate problem in the Hospital's well water was the reason to connect to Larned. The project required a pump station, three miles of 10-inch main with an additional seven valves and four hydrants added to supply water to the rural fire department. The city was also able to gain five new customers along the way including the Santa Fe Trail Center, a museum located three miles west of Larned on Hwy 156.

The three miles of transmission line was constructed with C-900 PVC with ductile iron fittings. The pump station includes two 20 hp pumps capable of 670 gpm each at 78 feet of head. There are two meters – one located at the pump station and one located on hospital property. The one located at the pump house was put there at Barker's

request to permit close monitoring of water loss. The peak demand for the hospital is about 670 gpm with average use approximately 150,000 gallons per day. The system is connected to city telemetry and is monitored and controlled from the Larned Water Department shop. The cost of this project was \$400,000. It was paid for by the hospital with the city of Larned handling system maintenance. Nowak Construction, Goddard, Kan., was the contractor while Schwab-Eaton P.A., Manhattan, Kan., provided design services.

Great rates

Larned's 2100 customers enjoy reasonable water rates; no rate increase was necessary to pay for all these upgrades. The Larned rate is \$10 minimum with 5000 gallons included with the minimum and \$1 per thousand gallons thereafter. To help keep these prices low in the future, Robert Barker has other practical

goals for the Larned water system in mind. He hopes to upgrade the city's other four wells from the present 2300-volt system to a much safer 480-volt system with VFD drives. This will further reduce the water hammer problems and save cost on main line breaks.

It is great to showcase Larned's community water system. It's one that I've had the pleasure of working with for many years. Also for me, it's a special pleasure to work with, learn from and help folks who are doing such a good job to sustain their Kansas community.

It's nearly annual conference time. This event is a very good investment for any city or RWD to attend. There are a variety of topics that concerning well maintenance and water quality issues. I hope to see you there. The program is reprinted on page 54 of this issue.

Arsenic Removal Made Easy!

3 FILTRATION MEDIA SOLUTIONS:

- LayneOx™** Arsenic, Iron & Manganese Removed Together
Co-precipitation BAT Process
- FERRISORB™** Granular Iron-based Media
Ideal for Pump & Treat
- Advanced AMBERPACK™ Municipal** Low Waste Ion Exchange
Hi-rate, Low Profile, Compact

Layne Call about pilot study evaluations

Layne Christensen Company • 913-321-5000
www.laynewtd.com • rrapard@laynechristensen.com