Daily Nonpareil
Council Bluffs, Iowa

BUSINESS: *Coming back to the Bluffs to make the water better*

CHAD NATION, Staff Writer
04/17/2005

Dave Fox always thought that he would like to work in his hometown one day.

"It was always in the back of my mind," the 1960 Thomas Jefferson High School graduate said.

He takes personal satisfaction in the newest project that the firm he started, FOX Engineering Associates Inc. of Ames, recently completed in Council Bluffs.

FOX and the city have teamed up on a variety of projects over the past eight years. The most recent effort, which included the planning and design of improved preliminary treatment screening and grit removal facilities at the Council Bluffs Wastewater Treatment Plant, has earned the firm an Engineering Excellence Award from the American Council of Engineering Companies of Iowa.

The award recognizes work in a project that is indicative of the innovation and application of new technology that FOX uses in engineering municipal water and wastewater systems, said Fox, the chairman of the firm's board.

"Everyone in the company takes pride in trying to maintain ourselves on the cutting edge," he said. "It's fun to do new things, and we've done a lot of innovative things; not because they are innovative, but because they work."

That is the case with the wastewater treatment plant. FOX's project manager, Keith Hobson, and project engineer, Laurie Twitchell, applied several unique features to the project, including the use of "headcell" technology to remove smaller particles of grit more efficiently from higher volumes of wastewater.

It's particularly important in Council Bluffs because of the very small grit particles from the sugar sand of the Missouri River valley.

Honored are the innovative efforts for the design of the $2.5 million screening and grit removal facilities for preliminary treatment of Council Bluffs' wastewater at the plant.

The City of Council Bluffs contracted with FOX in February of 2003 to evaluate and design the improvements to the plant's preliminary treatment facilities. Construction was

started in October of 2003 and improvements were operational in September of 2004.

As the wastewater enters the plant, debris and grit particles such as sand, gravel and other inorganic material are removed with the new facilities. The material is then cleaned and transported for disposal. The new grit removal equipment provides more efficient removal and extraction of smaller silt particles present in the Council Bluffs wastewater.

The new headcell technology was developed in Oregon, and the Council Bluffs installation is currently the largest in the world, providing more than 30 million gallons of treatment per day.

Currently, FOX is involved in an Iowa State University research project on nutrient reduction.

"That's probably going to be the next set of regulations to be handed down," Fox said.

Basic design of water and wastewater treatment hasn't changed all that much since Fox graduated with distinction from Iowa State University with a degree in civil engineering and a master's in sanitary engineering the following year. What has changed is the level of sophistication and the ability to control the outcomes, he said.

Fox didn't start out to be an environmental engineer. He was good in math and science in high school.

"That was the time of Sputnik, and anyone who showed those talents was encouraged to be an engineer," he said.

Environmental engineering is one of the softer, more touchy-feely aspects of engineering, Fox said. It's a cross between engineering and biological science.

The goal is clean water, and environmental engineering relies on living things doing much of the work toward that goal. "But the bugs don't always read the textbooks, and they don't always do what they're supposed to do," he said.

Experience and computer-collected data means that engineers now have a better understanding of why things work the way they do, Fox said.

"We have more information than when I started, more detail," he said. "As a result, we discovered more problems that we didn't know were there. We found contaminants we didn't know were there, so now we have to remove them."

One result is cleaner water. Another, Fox said, is regulators demanding that you prove not only that design technology works but that you know why it works.

"From a design standpoint, it's economical to standardize and use the same process every time," Fox said, "but we never thought that way. We have tried to find a better way of doing things."

That has meant working with equipment manufacturers trying to develop new, better, more efficient, faster and cheaper methods.

"We've always tried to keep an eye on those new offerings, to sort out which worked," Fox said. "The basic steps are the same, but at each step of the way someone may come up with an improvement."

That's sometimes a challenge for engineers, who Fox describes as being, by definition, naturally risk-averse.

That is why Fox said that despite all the research and the computer monitoring that have helped improve water and wastewater treatment, the most critical thing is common sense - to know that the data from the computers makes sense before you follow the data down the wrong track.

"That differentiates the keepers from the others when it comes to hiring engineers," he said.

Fox describes himself as an environmentalist who approaches environmental issues from a practical standpoint.

"We know what works and what doesn't, and there always is a cost factor involved," he said. "We want to do things for the environment that will improve it, but we aren't willing to spend a lot of money until someone can show me there actually is a problem to be fixed instead of fixing something that isn't broken."

In his 40 years, Fox said, there have been improvements and the environment is better off than when he started.