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# LEAP OF FAITH

An in-house pipe bursting program provides a cost-effective solution for a California sewer authority's I&I reduction and capital replacement initiatives

By Suzan Marie Chin

**“H**ow will we know that your projections and expected benefits will play out?”

That's the question Brett Richards faced from the Ross Valley Sanitary District board of directors when he proposed an in-house pipe bursting program to rehabilitate the sewers.

With great confidence, Richards put together a pilot program built on trust in his staff's talent, his own extensive knowledge, and a local technology provider. His faith has proven justified with a rehabilitation program that is providing a long-range solution for

the district, in Marin County, Calif.

The district is replacing some 200 miles of aging sewer mains at a regular pace, saving almost 40 percent in costs per mile when compared with contracted pipe bursting service.

## Wettest in the West

Ross Valley has one of the wettest climates on the West Coast. Average dry-weather flow to its wastewater treatment plant ranges from 4.8 to 5.6 mgd, but that spikes into 20 to 30 mgd during wet weather. The spikes are unusual for any collection system, so when Richards came on board as general manager of the district in

October 2008, he soon recognized that the system had a significant inflow and infiltration (I&I) issue.

The district includes the town of Larkspur, which has areas situated at or below sea level. A significant amount of the I&I was saltwater intrusion through pipelines in those areas. CCTV inspection and hydraulic modeling revealed what Richards suspected as a widespread problem, and he knew he needed a plan to replace or rehabilitate all 200 miles of the collection system.

In recruiting Richards, the board made it clear what his mission and primary objective should



**PROFILE:**  
Ross Valley  
Sanitary District,  
Larkspur, Calif.

**FOUNDED:**  
1899

**POPULATION SERVED:**  
59,000

**EMPLOYEES:**  
32

**INFRASTRUCTURE:**  
200 miles of sewer mains,  
20 pumping stations

**ANNUAL BUDGET:**  
\$28 million

**WEB SITE:**  
[www.rvsd.org](http://www.rvsd.org)



Ross Valley Sanitary District program coordinator and assistant engineer Dennis Gavallos (left) works with the support of TRIC Tools' John Rafferty to attach a bursting head and cable to a 350-foot length of HDPE main pipe. (Photos courtesy of David Wren)



District maintenance employees Fred Guerrero and Albert Coats and John Rafferty of TRIC Tools (in pit) position the TRIC M50 puller, designed to burst up to a 10-inch main with 50 tons of pulling capacity.

be. “The directive I received was, ‘We want to be the front runner, a premier sewer organization. We want to solve our problems before they become problems,’” Richards recalls. “I knew after I had been here just a short time and saw the influx of I&I that pipe bursting would be a good solution and an excellent place to start combating the problem.”

### Contract or in-house

Looking around, Richards saw potential to solve a number of problems by drawing upon the talent and experience of his own staff. The majority of the crew had been with the district for at least seven to 10 years and had extensive experience in excavation, pipeline repair, and manhole and lateral replacement. That provided a head start in creating a successful program.

Before approaching the board, Richards conducted a financial and feasibility analysis. “Any time you’re talking about adding staff and equipment, the questions that come up are what are the long-term benefits, salaries, retirement, and so forth,” he says. “As a manager doing the analysis, you have to ask yourself: How long will it take our program to be completed? How many miles of pipe can we realistically complete over a stated period?”

“If your realistic ability to solve your problem completely is anything longer than 30 years, then you’ve got issues that are not going to be solved in a timely or cost-effective way unless you take dramatic action like bringing staff in-house.”

That’s how Richard built his case. To achieve the goal of replacing the entire system, at a feasible

## SHARING THE BURDEN

Ross Valley Sanitary District was well aware of its significant I&I issues. Although much of the problem was caused by aging infrastructure, studies confirmed that a large share of the problem came from some 200 miles of private laterals throughout the region.

A local group, the North Bay Watershed Association, had been discussing a lateral ordinance and repair program for residents for several years, but the process seemed caught in “paralysis by analysis.”

In 2009, the district performed a study of its lateral ordinance, rewrote it, and launched a lateral grant program, setting aside \$250,000 for the first year. A customer who experiences a sewer issue must request a service call from one of several dozen contractors approved by the district. Then the customer must submit a grant application form along with a CCTV inspection and a copy of the invoice for the initial investigative service call, detailing all work performed.

The district staff reviews the video, and if the findings meet the criteria for a repair, the district approves the grant and puts the project into the queue. The property owner then has until the end of the fiscal year to hire an approved contractor to perform the work.

The grant allows for up to \$4,000 or half of the lateral repair cost, whichever is less. Within eight months of inception, the district accepted about 75 applications and disbursed \$248,000 in grants. Because of its success, the district will continue the program and plans to increase the amount of grant funds available.



Albert Coats fuses 20-foot sections of new pipe with a McElroy pipe fusion machine to create a 350-foot length of replacement main.

rate of five miles per year, the program would run 40 years, meeting Richards’ criteria for an in-house operation.

In addition, the district had a history with pipe bursting for its existing capital replacement program and could document the cost of doing the work with outside contractors and consultants. The average was about \$1.4 mil-

lion dollars per mile. Richards calculated that he could outfit a crew, with salaries, benefits, supplies, equipment, maintenance and retirement plans, for less than \$800,000 per mile.

“When we plugged the data points into the analysis, it became obvious that it was in our best interests to bring in-house staff,” Richards says. Armed with the



Dennis Gavallos operates the pipe fusion machine.

facts, he approached his board with the concept of an in-house bursting crew. The work began with an 18-month pilot program that would enable the crew to go through two full seasons.

Within just a few months from the program's inception in June 2010, the district is achieving productivity numbers not expected to be reached until at least a year into the program.

### Distinct advantages

Richard cautions that not every agency should expect the same results. He credits the district's fast track to success to the depth of experience of his crew, notably crew leader Dennis Gavallos, and to the support of TRIC Tools, the pipe bursting technology provider.

Because the crews had experience with the preparatory work that goes with pipe bursting — trenching, excavating, locating and site inspection — they only had to come up to speed on the actual bursting process.

"I can't overemphasize TRIC Tools' assistance and its impact on our success," says Richards. "They were an open book. They assessed our needs and have been with us every step of the way." TRIC assisted with factory and field hands-on training for all facets of the bursting technology and process, including physical assistance with actual projects.

Pipe bursting involves numerous steps. Before bursting can begin, the line to be replaced is inspected, laterals are located, and any sags in the line that need to be repaired are pinpointed. If a



Brett Richards, RVSD general manager.

sag is not too extreme, the quality of the new pipe usually enables the crew to burst through without changing the alignment.

Small excavation pits are created at the entry point for the new pipe and at the exit connection point. Small lateral connection potholes are also dug. Once the prep work is complete, the crews determine the direction of pull. If possible, they pull uphill, as that makes it easier to lubricate the bursting head and pipe during the pull. Once the direction is established, a pulling cable is inserted through the pipe and is attached to the hydraulic cable pulling device.

The new sections of HDPE pipe are then fused with a "hot pad" device that monitors temperature and fusing angle. The entire length of pipe is then attached to the bursting head and pulled into place. Once the main pipe is installed, crews also burst the lower lateral connection portions, creating a completely new infrastructure.

Using a saddle connector, they connect the new pipe to the property owner's portion of the lateral, and the reinstatement hole is cut.



The bursting head followed by the new HDPE pipe enters the old clay main as a pipe burst begins.

**"It becomes economy of scale for us. Between the manholes and getting as many homeowners on board with lateral replacement as possible, our goal is to leave behind a section of the system that is 100 percent new."**

**Brett Richards**

A two-way cleanout between the new lower lateral and the property owner's lateral is installed to give the district multiple angles from multiple locations to service the line in the future.

### While in the area ...

In 2009, the district started an innovative Lateral Replacement Grant program for homeowners that saw overwhelming success in its maiden year (see sidebar).

When a main is scheduled for bursting, the district does aggressive outreach in the neighborhood to let residents know they have an excellent opportunity to have their own laterals inspected by a certified contractor and that, if they qualify, they can receive grant funds to have their laterals

replaced during the mainline replacement project.

If manholes connected with a bursting project need to be rehabilitated, Richards often opts to simply replace them at the same time. "Since we're digging a pit in the location anyway and the crews are going to be on site for several weeks, it makes much more sense to dig out the old manhole and put in a new one versus attempt an intermediate restoration," he says.

"It becomes economy of scale for us. Between the manholes and getting as many homeowners on board with lateral replacement as possible, our goal is to leave behind a section of the system that is 100 percent new."

### No magic bullet

For Ross Valley, an in-house bursting program has proven to be an excellent fit, but Richards cautions that it may not be the magic bullet for every agency. He believes the keys to his district's success have been genuine desire on the part of the board and staff to solve the problem, and willingness to be honest and candid with each other.

"As a manager, you need to do some serious thinking about whether you have the ability right here and now in-house to do the work," Richards says. "If not, you are at a distinct disadvantage. It would be very unusual that even the most progressive agency would fully fund the permanent hiring of an entire new crew with a demonstrated track record."

An agency considering a similar program must evaluate its system, in particular the total scope of the project. "Do your due diligence," Richards advises. "If the numbers work, then take that leap of faith in yourself and your team. For us, it has been an excellent step for taking the district to the next level in system efficiency and performance." ♦

### MORE INFO:

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