

## Gaining Ground

PVC well casing is growing in popularity in steel country.

By Steve B. Gross

**E**d Squires, president of Hydro Logic Inc., a hydrogeological consulting firm in Boise, Idaho, is an avid promoter of PVC well casing for large-bore wells in a state that has been slow to embrace the use of PVC for that application.

Steel well casings remain the standard with drilling contractors throughout Idaho, owing to the fact that more than 80% of drilled wells are drill-and-drive air rotary domestic wells.

Another impediment to the use of PVC casing is a rule requiring drilling contractors to first apply for a waiver from the state government allowing them to use PVC. Although the waiver rule is more geared toward ensuring that drillers who use PVC casing do not use a low-grade PVC, it still creates yet another regulatory requirement for the contractor.

However, a change may not be too far down the road. Squires and other drilling professionals are currently working with state ground water agencies to promote the benefits of using PVC well casing and the open-hole drilling methods that facilitate its use. By doing this, they hope to give well owners and drillers more incentive to use PVC.

“We’re trying to make it easier for Idaho well drilling professionals to include PVC in their projects,” says Squires, a consulting hydrogeologist for more than 15 years. “We’re gaining a foothold with an impressive number of highly productive and trouble-free plastic wells now in use.”

He predicts that more ground water consultants, hydrogeologists, and drilling professionals will be using PVC casing in Idaho in the future as other states have done.

Over the years, Squires, who also teaches a class in field hydrogeology at Boise State University, has designed and inspected the construction, development, and testing of about 300 large-bore municipal, commercial, and irrigation supply wells in such fast-growing Idaho cities as Meridian and Caldwell. Hydro Logic has also designed irrigation, snow-making, and municipal wells at Tamarack Resort, a new, high profile all-season resort in Donnelly, Idaho.

Using CertainTeed Certa-Lok SDR 17 PVC well casing for all operations, Squires has designed and installed four wells in Meridian and Caldwell and three at Tamarack. There are also six more supply well projects now in the planning stages for these locations.

Squires engineered the first large-diameter municipal well in Meridian using a PVC casing, and continues to design PVC supply wells for a variety of other uses across the state, including a supply well for a new Pepsi Cola bottling plant in Nampa, Idaho.

“The Treasure Valley is one of the highest growth areas of the country,” Squires says. “The unprecedented population growth has led to a demand for additional water supply wells. We have two surface water treatment plants in our region, but

most of the Treasure Valley is 90 percent dependent on ground water.”

The foremost benefit of using PVC well casing is durability against outside elements found in wells. For instance, PVC is completely immune to electrolytic and galvanic corrosion and to virtually all chemicals normally used in wells, including chlorine-based disinfectants and highly corrosive acids used for well rehabilitation. Moderately corrosive waters in the Treasure Valley can cause steel well casing to corrode and oxidize. This can result in problems with water quality (staining) and a shorter well life. Steel well casings can also support the growth of iron bacteria and associated slimes, which can cause reductions in yield.

The corrosion of steel casing is apparent during the rehabilitations of older wells. Squires and his team have worked on a few jobs relining 30-year-old municipal steel wells by inserting a PVC casing inside a larger steel casing, centering it, and sealing it with bentonite grout. However, one of Hydro Logic’s municipal clients has recently had to line a heavy-wall, steel-cased well that is only nine years old. The old steel casings of these wells had deteriorated, but with their new PVC linings, they have been revitalized.

“The wells were fine, but the casings were corroded away,” Squires says. “Lining it with PVC will not only extend the life of the wells, but it also saves the client a lot of time, effort, and money.”

Squires uses no mild steel products in his current well designs, preferring to use only PVC pipe and stainless steel screens.

Another advantage found by Hydro Logic’s drilling contractors is the easier installation of PVC well casings, most important in an area where demand for new wells is on the rise. PVC has a lighter weight than steel and is easily assembled with couplings that lock and seal each casing length into place. It speeds up well drilling operations considerably. Staff at Treasure Valley Drilling & Pump Inc. in Weiser, Idaho — the firm which has drilled and installed most of the PVC wells designed by Squires — thinks it has saved lots of time on the jobs.

“We can set 600 feet of 17-inch PVC casing in place in less than a day,” says John Post, president of Treasure Valley Drilling & Pump. “That would have taken us two days with a steel casing. The Certa-Lok casing fits together beautifully. It helps the whole well go in a lot quicker. It’s excellent for direct mud rotary or reverse rotary open-hole drilling.”



Dave McLeran, owner of McLeran Well Drilling LLC in Fruitland, Idaho, prepares a PVC casing to be installed as the new lining in a corroded, old steel well in Meridian, Idaho.



A 17-inch PVC casing is ready for installation in a new supply well in Meridian, Idaho.

Treasure Valley Drilling & Pump, which is licensed to drill in six states, uses the direct mud rotary drilling method. The weighted fluid used in the well allows the borehole to stay open on its own, *PVC/continues on page 24*

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which enables the driller to install a full-depth well seal (grout), a stainless steel sand screen, and PVC well casing. Treasure Valley crews fabricate their own casing drive shoes on site by cutting a PVC coupling in half and fitting it, forming a stronger seal at the bottom for the casing. The PVC drive shoes can be forced to some extent into the clay formation at the top of the target aquifer.

Treasure Valley Drilling's direct mud rotary method also allows for easy installation of a sand filter envelope around the well screens, essentially eliminating problems in fine-grained sand formations. The PVC casing is set in place and supported with centralizing staves at joints and by a pressurized bentonite or cement grout seal that is placed from the top of the aquifer to land surface, forming a complete seal around the circumference of the PVC casing.

Direct mud rotary drilling allows for greater flexibility in determining how deep to bore for a well and often cuts costs for the customer. The superior seals created by this method prevent surface waters and shallow contaminated ground water from entering new wells.

Post and Squires say they have had nothing but satisfied customers in their municipal PVC well installations to date. Post has even begun using Certa-Lok SDR-17 PVC casing in the individual domestic well side of his business, having completed several subdivisions. Squires has extended his use of PVC products to include Certa-Lok PVC drop pipe, which he recently specified in the design of two 100-horsepower municipal pumping plants.

In fact, Squires believes some of the recently completed jobs could be on the track to becoming "100-year wells." [WWJ](#)