Fact Sheet

Suitability of Fiberglass and Other Polymeric Well Casing Materials for Groundwater Monitoring Applications

BACKGROUND

Work by our laboratory and others has shown that none of the commonly used well casing materials (stainless steel, PVC [polyvinyl chloride], and PTFE [polytetrafluoroethylene]) is ideal for all monitoring applications and groundwater environments. The purpose of this work was to assess the suitability of four alternative well casing materials: acrylonitrile butadiene styrene (ABS), fluorinated ethylene propylene (FEP), and two fiberglass products, fiberglass-reinforced epoxy (FRE) and fiberglass-reinforced plastic (FRP).

FINDINGS

Performance rankings (from least affected to most affected):

- Degradation by chemicals:
  FEP, PTFE < FRE < FRP < PVC < ABS
- Sorption of organic solutes:
  FRE, PVC < FEP, PTFE, FRP << ABS
- Leaching of organic constituents:
  PVC, FEP, PTFE < FRE < FRP << ABS
- Sorption and leaching of metals:
  FEP, PTFE < PVC < FRE < FRP and
  FEP, PTFE < PVC < FRE < SS 304, SS 316

Conclusions:

- PVC remains the best choice when monitoring for both metals and organics.
- FRE is a good substitute for and is less expensive than stainless steel.

PUBLICATIONS

Ranney, T.A. and L.V. Parker (1994) Sorption of trace-level organics by ABS, FEP, FRE, and FRP well casings. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 94-15.

Ranney, T.A. and L.V. Parker (1996) Sorption and leaching of trace-level metals by polymeric well casings. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 96-8.

Ranney, T.A. and L.V. Parker (1997) Comparison of fiberglass and other polymeric well casings. Part I: Susceptibility to degradation by chemicals. *Ground Water Monitoring and Remediation* **17**(1): 97–103.

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