



FIGURE 10.1

Using well construction materials inappropriate for site conditions can compromise sample integrity. In this case, corrosion of the galvanized steel casing and screen contributed metals (iron, zinc) to the samples, which resulted in anomalously high concentrations in analytical results.

- Improper selection and placement of filter-pack materials, resulting in well sedimentation, well-screen plugging, ground-water sample chemical alteration, or potential well failure (Figure 10.5).
- Improper selection and placement of annular seal materials, resulting in alteration of sample chemical quality, plugging of the filter pack and well screen, or cross-contamination from geologic units that have been improperly sealed off (Figure 10.6).
- Inadequate surface protection measures, resulting in surface water entering the well, alteration of sample chemical quality, and damage to or destruction of the well (Figure 10.7).

Any one or a combination of these monitoring well design and installation problems could cause a well or series of wells to be unsuitable for collecting representative ground-water data. On the basis of an examination of sampling results from thousands of wells, the authors estimate that more than 65% of ground-water monitoring wells installed in North America since the late 1970s suffer from more than one of the aforementioned problems, and thus are improperly designed for their intended purpose. As a result, many of these wells are producing water-level data, hydraulic conductivity test data, and ground-water samples that are not representative, in terms of the data expected from them. The consequences are: (1) inaccurate and misleading water-table or potentiometric surface maps and depictions of ground-water flow directions and hydraulic gradients; (2) inaccurate and misleading ground-water flow rate calculations; and (3) inaccurate and misleading depictions of ground-water chemistry and maps of contaminant plume

FIGURE 10.2

Using nonsta
drain pipe as
samples, and
analytical res

concentrati
missioned
design and
representa

FIGURE 10.3

Using a "one-
sand) usually
However, filt