
Perchlorate in Groundwater—There's a New Kid in Town

2004-12-16

Sampling mandated in early 2004 by the Massachusetts Department of Environmental Protection (DEP) has identified perchlorate in many drinking water supplies throughout the Commonwealth. Most commonly associated with military ordnance and related activities, where it is used as a propellant, perchlorate for years also has been used in a number of more common settings, including by many blasting companies in construction work. Recent advances in sampling methods, somewhat uncertain risks relating to this substance, and the quickly evolving regulatory standards make this possible contaminant a particular challenge for developers, property owners, municipalities, and those in the construction industry. This email alert summarizes some of the information and issues of which parties should be aware regarding perchlorate.

The Perchlorate Problem

Perchlorate is an inorganic chemical that originates from the salts of potassium-, ammonium-, and sodium-perchlorate, which are primary ingredients in solid propellants for rockets, missiles, and fireworks. Production of ammonium perchlorate began in the United States in the mid-1940s. The substance first was discovered in the surface and groundwaters of the United States in the late 1990s. Ammonium perchlorate and other perchlorate salts can be found in a number of commercial and industrial applications. The most extensive use of perchlorate, however, has been by the Department of Defense (DOD)—and those associated with DOD—for explosives and rocket propellants. Because it can only be stored for a limited time, the ammonium perchlorate used by the United States in rockets and missiles must be replaced periodically, resulting in the need to dispose of significant amounts of the substance.

Perchlorate's profile as a water contaminant has been raised in recent years following discoveries of perchlorate in groundwater emanating from a variety of sites with current or historic ties to DOD and/or DOD contractors. As of April 2003, 26 states had reported perchlorate releases. Environmental regulators are proceeding with perchlorate standards for groundwater and drinking water based on claimed health risks.

Massachusetts's Response

DEP saw much evidence relating to perchlorate use and its aftermath in addressing conditions at

the Massachusetts Military Reservation (MMR) where DOD used perchlorate for decades. Following the discovery of perchlorate in Massachusetts drinking water supplies, the Commonwealth has taken a number of steps to address what it perceives is a potential public health threat by proposing drinking water and groundwater cleanup standards for the substance.

On January 26, 2004, presumably after reviewing data from work at MMR, DEP notified Massachusetts's public water suppliers that it planned to adopt emergency regulations that would require certain water systems to monitor for perchlorate over the next year. DEP asserted its desire to collect sampling data to determine the degree to which perchlorate exists in Massachusetts drinking water sources so that the agency could determine whether it should set a Maximum Contaminant Level (MCL) for perchlorate.

DEP promulgated a perchlorate emergency regulation effective February 13, 2004, mandating that groundwater systems take one sample at every entry point to their distribution systems (representative of each well after treatment) during the months of April and September 2004 and that surface water systems sample in March 2004 and then once in each calendar quarter until December 31, 2004. In spring 2004, DEP issued an interim Drinking Water Guideline of 1 ppb for perchlorate "directed at sensitive subgroups of pregnant women, infants, children up to the age of 12, and individuals with hypothyroidism." DEP's guideline provides that those subgroups "should not consume drinking water containing concentrations of perchlorate exceeding 1 ppb" and states that DEP "recommends that no one consume water containing perchlorate concentrations greater than 18 ppb."

DEP is proposing a reference dose (RfD) (an estimated dose to which a person can be exposed without appreciable adverse health risk) of 3×10^{-5} mg/kg-day to be used in site-specific risk assessments. Based on that RfD, the Department is proposing a groundwater cleanup standard of 1 ppb as part of its proposed revisions to the Massachusetts Contingency Plan (MCP). Massachusetts would be the first state in the nation to adopt a standard for perchlorate; the proposed standard is materially more stringent than some under consideration elsewhere, and orders of magnitude lower than the levels advocated by DOD. DEP has not yet formally proposed an MCL for perchlorate, but is following the interim guideline discussed above. The implications of Massachusetts's effort for New England businesses could be significant.

Other states also are considering setting standards for perchlorate. At the end of October, California's Department of Health Services (inadvertently, according to public statements) posted on its website a draft rule that would set a drinking water standard of 6 ppb. California previously had set an identical non-enforceable state Public Health Goal. Nevada has established an "Action Level" of 18 ppb for perchlorate.

DEP recently conducted a series of public meetings to discuss the proposed changes to the MCP, including the perchlorate standard. The comment period on the proposed MCP revisions, including the adoption of the RfD and the proposed groundwater cleanup standard, closed on December 10, 2004.

Where is US EPA?

Widespread perchlorate contamination was not observed in the United States until 1997, when a new analytical method allowed detection of perchlorate at the level of 4 ppb. Perchlorate contamination has now been reported in the majority of states. Also in 1997, US EPA issued an interim MCL guidance of 4-18 ppb. In 1998, US EPA placed perchlorate on the Contaminant Candidate List for possible regulation. In 1999, the agency required drinking water monitoring for perchlorate under the Unregulated Contaminant Monitoring Rule. Most recently, in January 2002, US EPA released an extensive draft perchlorate health assessment document, which recommended an oral reference dose (RfD) of 3×10^{-5} mg/kg-day and a resulting drinking water standard of 1 ppb. That assessment is under review by the National Academy of Sciences (NAS). NAS was expected to issue its findings the week of December 6, 2004, but those findings have not yet been issued. US EPA's interim MCL guidance for perchlorate remains 4-18 ppb.

Of course, because much of the perchlorate used in the United States was at the behest of the federal government, there is much controversy over what standard should apply and how it should be implemented nationally. Perhaps of greatest significance to the business community, government entities may bear a substantial share of responsibility for perchlorate contamination in certain contexts. Interested parties should watch these developments.

More Perchlorate Discoveries in Massachusetts

The sampling required by DEP's emergency rule has identified perchlorate in water supplies throughout the Commonwealth. Most of those data do not appear to relate to DOD activities. Indeed, the widespread nature of the data suggests similar investigations could identify perchlorate throughout the United States. The Department's proposed regulations are likely to be a precursor of things to come nationally. Businesses with interests at stake should act promptly to protect their interests as proposed regulations evolve, and to manage their risks and inform their conduct as relevant data develop. The possibility of a sudden surge in perchlorate data and the fact that relevant data have been available only for a few years suggest involved businesses should act promptly to best protect their interests.

Authors



Robert C. Kirsch

SENIOR COUNSEL

✉ rob.kirsch@wilmerhale.com

☎ +1 617 526 6779