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Axelson, John

From: Axelson, John
Sent: Tuesday, May 03, 2011 5:13 PM
To: 'Daryl and Cynthia Burkhart'
Cc: Baldwin, Debbie; Lindblom, Steven; Gintautas, Peter
Subject: RE: Dissolved metals

Cynthia and Daryl,

One of the COGCC staff members, Peter Gintautas, is a Ph.D. Chemist who also has an extensive background in geology and hydrogeology. He also formerly managed a laboratory that commonly performs the analyses we use when evaluating groundwater for potential impacts from oil & gas. He took the time to review the data and address your comments regarding Method 6010B below.

U.S. EPA SW-846 Method 6010 is well suited for analysis of a variety of matrices including relatively low TDS groundwater samples such as collected from the Burkhart water well. There are several parts of the process done during the preparation and analyses of these samples that do ensure that the lab can detect metals at the reporting limit concentrations quoted in their reports. I will outline three specific parts of the process below that you may not be aware of.

Samples collected on 03/16/2011 and 04/13/2011 from the Burkhart water well were prepared (digested) by SW-846 method 3010 for "total" fraction analysis. The digestion process results in a prepared sample aliquot that typically contains nearly 5% by volume hydrochloric acid. Samples for dissolved metals analysis are not always prepared in this manner but the prep and analytical methods require that the standards be matrix matched to the samples if the digestion was not performed.

Analytical standards are prepared in similar concentration acid to the prepared samples. This is known as matrix matching in analytical chemistry. Thus none of the samples or analytical standards are low TDS solutions. Also Method 6010 requires at a minimum a daily low-level calibration check at or near the reporting limits for each element. The low level calibration check is done to ensure that the lab can detect the lowest part of its calibration range.

The lab also performed a 6010 matrix spike/matrix spike duplicate on aliquots of the Burkhart samples collected on 03/16/2011. This process is part of quality assurance procedures done to enable the lab and the user of the data to determine if there are problems in analyzing the matrix provided to the lab. All of the matrix spike recoveries for the metals tested were within 90-110% of the spiked concentration. This indicates there were no problems encountered in analysis of the dilute groundwater samples provided from the Burkhart well as the recoveries are within the control limits for the calibration check standards and within much tighter windows than the statistically derived matrix recovery limits.

There are now multiple sampling and analysis events to evaluate. The reported presence of metals such as lead in only one of the samples and not in the other indicates that the source of the metals is not in the water pumped from the well but is more likely to be present as an artifact of the sampling or analyses. When you have one result showing presence and four or more results showing absence at or below the reported presence then the one reported presence is questionable.

The analytical methods and parameters chosen by COGCC staff are not intended to provide analyses as required for public drinking water supply systems. Your water well is a private supply system. The analyses and

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