



STATE OF
COLORADO

Allison - DNR, Rick <rick.allison@state.co.us>

USAF water well sample results

Allison - DNR, Rick <rick.allison@state.co.us>

Wed, Oct 26, 2016 at 4:19 PM

To: "WRIGHT, SHAIN L GS-11 USAF AFGSC 90 CES/CEIEC" <shain.wright@us.af.mil>

Hi Shain,

I have attached the results of the stable isotope analysis for methane, if present. Methane was only present in the N01 sample. The stable isotope data confirm that the methane is biogenic in origin and not thermogenic. Thermogenic methane is produced by the heat and burial of organic material in rocks and is the type of methane produced by the oil and gas wells in the area. Biogenic methane is produced from the microbial decay of organic matter in an oxygen starved environment, such as the Upper Pierre Aquifer. The plot on the third page of the file shows this. This is similar to the results for many of the private water wells we have sampled as part of this project.

Please let me know if you have any questions about these results.

Best Regards,
Rick

Richard Allison, P.G.
Environmental Protection Specialist, Northeast Colorado



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On Fri, Oct 21, 2016 at 10:20 AM, WRIGHT, SHAIN L GS-11 USAF AFGSC 90 CES/CEIEC <shain.wright@us.af.mil> wrote:

Rick,

Thank you for the data and review.

Respectfully,
Shain L. Wright
Water Program Manager
F. E. Warren AFB
Tel: 307-773-4357 DSN: 481-4357

-----Original Message-----

From: Allison - DNR, Rick [mailto:rick.allison@state.co.us]

Sent: Friday, October 21, 2016 9:21 AM

To: WRIGHT, SHAIN L GS-11 USAF AFGSC 90 CES/CEIEC <shain.wright@us.af.mil>

Subject: USAF water well sample results

Hi Shain,

COGCC received the analytical results for the L01 and N01 locations yesterday afternoon. I have attached both laboratory reports to this email, along with the field data sheet for field parameters measured during the sampling event. In addition, if you would like to access the data in the COGCC sample database, you can do so at the

following links. You can also download a CSV file from these links:

AFB N01: <http://cogcc.state.co.us/COGIS/EnviroSample.asp?facid=755061>

AFB L01: <http://cogcc.state.co.us/COGIS/EnviroSample.asp?facid=755062>

The sample for the L01 site appears to be high quality water with a TDS of 200 mg/l and no methane or VOCs detected. This makes me think that this well is not completed in the Upper Pierre Aquifer, which is likely based on its depth and location. It also indicates that the sample may be collected post-treatment. We just don't see that low of TDS in a bedrock aquifer in this part of the state.

The sample for the N01 site just north of New Raymer is similar to many of the samples we have collected from water wells in the Upper Pierre Aquifer. The sample has a TDS of 1400 mg/l composed mainly of sodium-bicarbonate with some chloride. None of the individual parameters exceeds a drinking water standard. TDS exceeds the secondary maximum contaminant level of 500 mg/l. This is an aesthetic standard, and not health based. No VOCs were detected. Methane is also present at a concentration of 12 mg/l. There is no drinking water standard for methane, because it is not toxic. However, at the concentration detected there may be a potential safety hazard and you should take precautions to ensure the water system is adequately vented to prevent the buildup of methane. If the methane occurs at a high enough concentration and if it is allowed to accumulate in a confined space, such as a well pit, crawl space, closet, etc., an explosion hazard can be established. Initial indicators are that the methane is biogenic and occurs naturally in the aquifer due to the anaerobic bacterial decay of organic carbon in the aquifer. The trace detection of ethane and no detection of propane supports this. Further analysis of the stable isotopes of methane is pending, which will provide confirmation that the methane is biogenic in origin. Field notes indicate that this sample was collected upstream of the treatment system.

Please contact me if you have any questions about these results.

Best Regards,

Richard Allison, P.G.
Environmental Protection Specialist, Northeast Colorado

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2 attachments

 **JOB 16090705 COGCC - AFB L-01.pdf**
866K

 **JOB 16090705 COGCC - AFB N-01.pdf**
699K