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North America Division



April 7, 2009

Ms. Renee McClure  
21000 HWY 52  
Hudson, Colorado 80642

RE: Water Well Sampling Results  
21000 HWY 52  
Hudson, Colorado 80642

Dear Ms. McClure:

On March 25, 2009, LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted sampling of your domestic well at 21000 Highway 52 in Hudson Colorado. The purpose of the sampling was to determine if surrounding oil and natural gas production activities have impacted your water well.

General water quality parameter results have not been received from the laboratory as of the date of this letter. Noble expects these results within the next few weeks.

Gas samples collected from your well were submitted to Isotech Laboratories of Champaign, Illinois (Isotech) for analysis of gas composition and methane isotopes. Those results are quite similar to those obtained separately by the Colorado Oil and Gas Conservation Commission (COGCC), and reported to you in COGCC's letter of April 3, 2009. A summary of the results obtained by Noble is presented below.

### **Gas Composition**

Compounds detected during the gas composition analysis included methane and ethane, compounds which comprise biogenic gas. As you know from recent meetings and correspondence with COGCC, biogenic gas is commonly found in water wells throughout Weld County, Colorado that are completed in the Laramie-Fox Hills (LFH) Aquifer. The LFH Aquifer has multiple continuous coal seams which are known to produce biogenic gas.

As seen in the attached analytical report, certain heavier hydrocarbon compounds, ethylene through hexanes, were not detected in the gas sample from your water well. These compounds are indicative of thermogenic gas. These results from the gas composition analysis performed for Noble are in general agreement with the results obtained by COGCC, and would appear to be consistent with COGCC's conclusion that the gas present in the water well is shallow biogenic

gas and does not indicate that the aquifer has been impacted from surrounding oil and natural gas production activities.

### **Isotopic Analysis of Methane**

The deuterium/hydrogen isotope ratio for methane gas in the sample collected from your well is -280.3 parts per mil. The carbon 13/carbon 12 isotope ratio for methane gas in the sample collected from your well is -73.29 parts per mil. These results are also in general agreement with those obtained by COGCC.

### **Conclusion**

Analytical results for gas composition and stable isotopic analysis of gas obtained by Noble from your water well are in general agreement with those obtained by COGCC. The remaining analytical results from your water well sample will be submitted to you under separate cover once received by Noble's contractor.

Please call us at 970-785-5000 if you have any questions or comments regarding this report.

Sincerely,

NOBLE ENERGY, INC.



Mike Cox  
Environmental Coordinator

Attachment

cc: Debbie Baldwin, COGCC

**ATTACHMENT 1**  
**GAS COMPOSITION AND ISOTOPIC**  
**ANALYTICAL REPORT**

# ANALYSIS REPORT

Lab #: 159180 Job #: 11200  
 Sample Name/Number: Renee McClure  
 Company: LT Environmental  
 Date Sampled: 3/24/2009  
 Container: Dissolved Gas Bottle  
 Field/Site Name:  
 Location:  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 3/26/2009 Date Reported: 4/01/2009

Component	Chemical mol. %	Chemical Air Free vol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----					
Hydrogen Sulfide -----	nd	nd			
Helium -----	0.088	0.099			
Hydrogen -----	nd	nd			
Argon -----	0.43	0.37			
Oxygen -----	2.30				
Nitrogen -----	29.00	22.95			
Carbon Dioxide -----	0.23	0.26			
Methane -----	67.90	76.27	-73.29	-280.3	
Ethane -----	0.048	0.054	-46.67		
Ethylene -----	nd	nd			
Propane -----	nd	nd			
Iso-butane -----	nd	nd			
N-butane -----	nd	nd			
Iso-pentane -----	nd	nd			
N-pentane -----	nd	nd			
Hexanes + -----	nd	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 689  
 Specific gravity, calculated: 0.692

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100 percent. Mol. % is approximately equal to vol. %