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October 3, 2017

CERTIFIED MAIL NO. [REDACTED]

[REDACTED]

Re: 58 Pa. C.S. § 3218 Determination
Water Supply Request for Investigation No. 280020
Moreland Township, Lycoming County

Dear [REDACTED]

The Department has completed its investigation of your water supply located at the above address ("Water Supply"). On March 8, 2012, the Department issued you a letter indicating that the Water Supply had been impacted by oil and gas operations. Based on the review of subsequent sample results and supplementary information obtained to date, the Department has determined that the source of the impact appears to have been mitigated, and the Water Supply has returned to a background condition. Nevertheless, please note that your water quality does not meet (*i.e.*, is worse than) the following health and/or aesthetic statewide standards:

Parameters	Unit	Statewide Standards or Recommended Levels	Your Sample Results that Are Above Statewide Standards/Levels
Manganese	mg/L	0.05	0.069

Based on current post-remedial system sampling, the remedial system that was previously installed on the Water Supply appears to be effectively alleviating the levels of the above results. The Department's investigation into your complaint is set forth below.

Summary of Investigation

On May 20, 2011, you complained to the Department that methane gas had impacted your Water Supply. During inspections conducted by the Department and others, methane gas was observed in the water and the headspace of the Water Supply. Samples from the Water Supply were collected as shown in the attached tables, and submitted to a Pennsylvania-accredited laboratory for analysis.

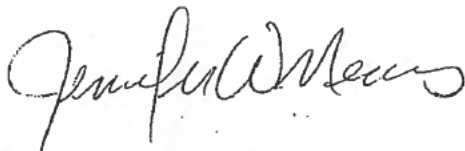
Initial results of samples from the Water Supply showed that the Water Supply had levels of methane above background conditions. However, additional sampling results revealed that the source of the stray gas has been mitigated and that those levels have returned to levels which are consistent with pre-drilling samples collected from the water supply. The enclosed tables

compare those results. Continued use of the previously installed treatment system should continue to mitigate any low levels of dissolved methane still present in the Water Supply.

Manganese, a common metal associated with groundwater in the region, remains above its secondary maximum contaminant levels (SMCLs) in water samples collected from the Water Supply. The most recent concentration detected (0.069 mg/L) is consistent with manganese concentrations observed during pre-drill sampling (0.06 mg/L). The most likely source of manganese is from the bedrock from which the Water Supply derives its water and geochemical reactions within the Water Supply.

Based on the Department's investigation, the Department has determined that the impacts on the Water Supply were temporary and that the quality of the Water Supply has returned to background conditions.

Please contact William J. Kosmer, P.G. at 570-974-2613 should you have any questions concerning this matter.



Jennifer W. Means
Environmental Program Manager
Eastern Oil and Gas District

Enclosures:
Laboratory Analytical Tables
"How to Interpret A Water Analysis Report"

cc:
William J. Kosmer, P.G.
Stephanie Wharton
Sharon Steinbacher
Complaint File # 280020



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DISTRICT OIL AND GAS OPERATIONS

3/8/2012

[REDACTED]

CERTIFIED MAIL NO. [REDACTED]

Re: Act 223, Section 208 Determination
Complaint No. 280020
Moreland, Lycoming County

Dear [REDACTED]

The Department has investigated the possible degradation of your water supply well located at [REDACTED] in response to a 5/20/2011 complaint that gas well drilling activities may have affected your water well. On 5/20/2011, the Department collected samples from your water supply. The samples were submitted to the Department's laboratory in Harrisburg for analysis. The analytical reports for the samples were previously submitted to you in a letter dated 7/7/2011. The sample results showed methane was present at 11 mg/l in your water supply. Since the initial sampling on 5/20/2011, several additional samples have been collected and analyzed from your water supply, and the results have been summarized on the attached Table 1 and Table 2. At this time, the Department's investigation indicates that gas well drilling has impacted your water supply.

Methane is the predominant component of natural gas. Federal water standard limitations have not been established for methane gas. The level of concern begins above 28 mg/l methane, which is referred to as the saturation level. At this level, under normal atmospheric pressure, the water cannot hold additional methane in solution. This may allow the gas to come out of the water and concentrate in the air space of your home or building. There is a physical danger of fire or explosion due to the migration of natural gas into water wells or through soils into dwellings where it could be ignited by sources that are present in most homes/buildings. Natural gas can also cause a threat of asphyxiation, although this is extremely rare.

When the Department is made aware of methane levels greater than 7 mg/l, we notify the water supply owner of the hazards associated with methane in their water supply. Please be aware however, that the methane levels can fluctuate. This means that even with a relatively low level of methane, you should be vigilant of changes in your water that could indicate an increase in methane concentration.

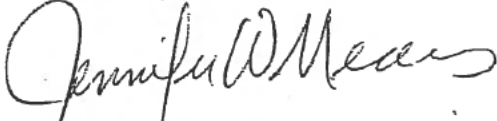
It is the Department's recommendation that all water wells should be equipped with a working vent. This will help alleviate the possibility of concentrating these gases in areas where ignition

3/8/2012

would pose a threat to life or property. Please note that it is not possible to completely eliminate the hazards of having natural gas in your water supply by simply venting your well.

The Department is continuing to work to permanently resolve this issue. Should you have any questions concerning this matter, please feel free to contact William J. Kosmer, P.G. at 570-974-2613.

Sincerely,



Jennifer W. Means
Environmental Program Manager
Oil and Gas Management

Enclosures:

Table 1 and Table 2

"How to Interpret A Water Analysis Report"

cc:

Jennifer Means

John Ryder

William J. Kosmer, P.G.

Jeremy Daniel

Complaint File 280020

German Run Gas Migration File