



December 10, 2018



CERTIFIED MAIL NO. [REDACTED]

Re: Water Supply Request for Investigation ID: 331774
58 Pa.C.S. § 3218 Determination
Ridgebury Township, Bradford County

Dear [REDACTED]

The Department of Environmental Protection (Department) has been investigating the possible degradation of your water supply located at the above referenced address (“Water Supply”), in response to a complaint received on January 9, 2018, that recent oil and gas activities may have affected your Water Supply. The Department’s investigation, prompted by information you provided, has determined that your Water Supply was adversely affected by oil and gas activities, including but not limited to the drilling, alteration, or operation of an oil or gas well. The information upon which this determination is based is summarized below.

Summary of Investigation

On January 9, 2018, the Department was notified by UGI of an occurrence of stray gas migration at your property, which they investigated on January 7, 2018. The Department and a third party contractor on behalf of EOG Resources conducted sampling of your Water Supply on January 10, 2018. Both the Department’s and EOG’s sample results indicated methane was present in your Water Supply at concentrations above Department action levels. The Department collected additional samples from your Water Supply on April 23, 2018 and May 23, 2018. Methane levels were also elevated during those sampling events. The Department’s samples were collected as shown in the enclosed table, and submitted to the Department’s laboratory in Harrisburg for analysis. The attached sample results table shows that the following analytes also exceeded Department standards during one or more of the sampling events: aluminum, barium, chloride, iron, manganese, total dissolved solids (TDS), turbidity, total coliform bacteria, and *E.coli*. Note that Primary Maximum Contaminant Levels (MCLs) are intended to reflect potential dangers to human health, while secondary Maximum Contaminant Levels (SMCLs) reflect the aesthetics of the water (i.e. taste, smell, etc.). Sampling conducted by the Department on May 23, 2018 also indicated the presence of iron-reducing bacteria, sulfate-reducing bacteria, and slime-forming bacteria, for which there are no standards. Pre-drill samples had not been collected from your Water Supply prior to any oil and gas activity in the area.

CID 331774 WS Exceedances and Bacteria Detections					
Results in mg/l unless otherwise noted.	EOG Sample 1/10/2018	DEP Sample 1/10/2018	DEP Sample 4/23/2018	DEP Sample 5/23/2018	MCL (mg/l) *
	2288002001	0973-173 & 174	3243-352 & 353	3243-378 & 379	Denotes Primary MCL
Aluminum	0.81	1.117	<0.2	<0.2	0.2
Barium	2.9	2.92	2.719	2.902	*2
Chloride	347	366	357	355	250
Iron	1.8	2.144	0.778	1.124	0.3
Manganese	0.2	0.152	0.062	0.079	0.05
TDS	651	800	808	768	500
Turbidity	33.1 NTU	29.52 NTU	5.64 NTU	7.91 NTU	*1 NTU
Iron-reducing bacteria	-	-	-	~9,000 cfu/mL	No Standard
Sulfate-reducing bacteria	-	-	-	~325 cfu/ml	No Standard
Slime-forming bacteria	-	-	-	13,000 cfu/ml	No Standard
E. coli	-	-	-	1/100 ml	*1/100 ml
Total coliforms	-	-	-	>200/100 ml	*1/100 ml
Methane	23.9	51.6	49.5	48.7	**7

** 7 mg/L represents the Department's unofficial action level for dissolved methane in groundwater.

BOLD - Exceeds a Standard

The post-complaint laboratory analytical results from your water supply indicated dissolved methane concentrations ranging from 48.7 mg/L to 51.6 mg/L in the samples collected by the Department.

Samples of the methane from the Water Supply were collected and sent to a specialized laboratory for isotopic and compositional analysis. These analyses allowed for a more detailed characterization of the gas present in the Water Supply. The results are attached for your records. The water quality analysis, isotope and compositional analyses, elevated concentration of dissolved methane, and presence of combustible gas in the headspace of your water well indicate that the stray gas in your Water Supply is most likely associated with oil and gas activities.

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 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 regarding this investigation, please contact Caleb Woolever at 570-327-0546.

Sincerely,



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

Enclosures:

Laboratory Analytical Results Table

cc:

Stephanie Wharton (email)
Caleb Woolever (email)
Matt Nuss (email)
Complaint File # 331774