pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

September 19, 2024

CERTIFIED MAIL NO. [redacted]

[redacted]

Re: Water Supply Request for Investigation ID: 360490 and 364626
58 Pa. C.S. § 3218 Determination
Lenox Township, Susquehanna County

Dear [redacted]

The Department of Environmental Protection ("Department") has been investigating the possible degradation of your home water supply ("Water Supply 1") and your commercial garage water supply ("Water Supply 2") located at the above-referenced address (collectively "Water Supplies") from oil and gas activities. The Department has determined that the Water Supplies were 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.

Please note that without any treatment, water quality sampling indicates that on occasion your water quality does not meet (i.e., is worse than) the following health and/or aesthetic statewide standards. 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.). Certain sample parameters in the Water Supplies were above a MCL and above some SMCLs, as set forth in the tables below.

Water Supply 1:

Parameters	**Unit**	**Statewide Standards or Recommended Levels**	**Your Highest Sample Results that Were Detected Above Statewide Standards/Levels**
Aluminum	mg/L	0.2	**16.30**
Arsenic	mg/L	0.010*	**0.0448**
Iron	mg/L	0.3	**20**
Manganese	mg/L	0.05	**0.824**
Methane	mg/L	7 (DEP Action Level)	**54**

"*" Denotes a Primary MCL

Please note that arsenic has not been detected in Water Supply 1 over its MCL since November 23, 2021.

Water Supply 2:

Parameters	Unit	Statewide Standards or Recommended Levels	Your Highest Sample Results that Were Detected Above Statewide Standards/Levels
Iron	mg/L	0.3	**1.2**
Manganese	mg/L	0.05	**0.28**
Methane	mg/L	7 (DEP Action Level)	**37**

Summary of Investigation

On November 11, 2021, the Department was notified that the water from Water Supply 1 had become effervescent with yellow discoloration. On June 6, 2022, the Department was notified that methane was detected in Water Supply 2 during ongoing screening related to the gas migration investigation. Subsequently, water quality samples were collected from the Water Supplies on several occasions by the Department and private consultants. The samples were submitted to the Department's laboratory in Harrisburg or to an accredited third-party laboratory for analysis. The analytical reports for the samples collected by the Department were previously provided to you, but are summarized for your convenience in the enclosed table along with sample results provided by Coterra Energy, Inc.

Samples of the methane from the Water Supplies 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 Supplies. The isotope and compositional analyses indicate that the stray gas in your Water Supplies appears to be 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, it notifies 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 Supplies by simply venting your wells.

The Department is continuing to work to permanently resolve this issue. Should you have any questions regarding the investigation, please contact Eric Rooney, P.G. at 570.346.5543.

Sincerely,

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

Enclosures:
Laboratory Analytical Results Table

c: Michael O'Donnell
Eric Rooney, P.G.
Briana Cunningham
Complaint Files # 360490 & 364626

CID# 360490	8/5/2011	8/20/2013	11/12/2021	11/15/2021	11/17/2021	11/22/2021	11/23/2021	11/23/2021	11/29/2021	12/13/2021	12/13/2021	1/6/2022	
	Cabot	Cabot	DEP	DEP	Coterra	Coterra	Coterra	Coterra	Coterra	DEP	Coterra	DEP	
Results in mg/L unless otherwise noted.	raw	raw	raw	raw	raw	raw	raw	treated	raw	raw	raw	raw	**MCL/Standard**
Methane	<0.1	<0.0050	**23.7**	**29.5**	**33**	**33**	**27**	**12**	**29**	**31.8**	**32**	**38.9**	**7
Ethane	<0.025	<0.0050	0.200	0.258	0.270	0.270	0.260	0.0051	0.260	0.395	0.290	0.540	No Standard
Propane	<0.05	<0.0050	<0.0142	<0.0142	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0142	<0.0050	<0.0142	No Standard
Alkalinity	~	86.1	~	85.8	~	~	89	94	~	88.6	83	85.0	No Standard
Aluminum	~	**0.867**	~	**16.300000**	~	~	**7.3**	**2.1**	~	**0.476**	**0.48**	0.232000	0.2
Arsenic	~	0.0037	~	**0.044800**	~	~	**0.012**	0.0030	~	<0.00300	0.0021	<0.00300	*0.010
Barium	~	0.0395	~	0.132	~	~	0.11	0.061	~	0.033	0.039	0.036	*2
Bromide	~	<0.10	~	<0.2	~	~	<0.50	<0.50	~	<0.2	<0.50	<0.2	No Standard
Calcium	~	35.6	~	36.300	~	~	38	39	~	34.940	36	34.800	No Standard
Hardness	~	105	~	116	~	~	140	120	~	105	120	104	No Standard
Iron	~	**3.08**	~	**19.600**	~	~	**20**	**2.8**	~	**1.216**	**1.2**	**1.193**	0.3
Lithium	~	<0.0200	~	0.02500	~	~	<0.050	<0.050	~	<0.0250	<0.052	<0.0250	No Standard
Magnesium	~	4.38	~	6.22	~	~	5.5	4.8	~	4.28	4.5	4.25	No Standard
Manganese	~	**0.143**	~	**0.824**	~	~	**0.55**	**0.073**	~	0.046	0.050	**0.060**	0.05
pH (units)	7.09	~	~	7.6	~	~	7.4	8.2	~	7.4	7.5	7.2	6.5-8.5
Potassium	~	1.15	~	3.35	~	~	3.3	2.2	~	1.06	1.2	1.10	No Standard
Selenium	~	<0.0020	~	<0.00400	~	~	<0.0010	<0.0010	~	<0.00400	<0.0010	<0.0400	*0.05
Sodium	~	13.5	~	14.50	~	~	15	16	~	13.94	14	13.67	No Standard
SPC (µS/cm)	167	~	~	285.00	~	~	270	280	~	281.00	280	281.00	No Standard
Strontium	~	0.258	~	0.264	~	~	0.27	0.29	~	0.246	0.26	0.247	No Standard
Total Chloride	~	27.7	~	31.42	~	~	31	13	~	30.41	28	29.04	250
TDS	~	149	~	206	~	~	150	160	~	154	160	156	500
Total Sulfate	~	8.6	~	8.61	~	~	9.2	7.5	~	8.91	9.0	8.98	250
TSS	~	20.9	~	212	~	~	210	48	~	<20	7.8	20	No Standard
Turbidity (NTU)	~	29.5	~	382.50	~	~	200	45	~	25.50	14	19.10	No Standard
Zinc	~	<0.0200	~	0.05000	~	~	0.080	0.014	~	<0.0300	0.020	<0.0300	5

Highlighting indicates an exceeded standard or level~ = Not analyzed * Denotes Primary MCL < Indicates analyte was not detected above its detection limit.

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

CID# 360490	1/6/2022	1/10/2022	1/10/2022	1/24/2022	1/24/2022	1/25/2022	2/10/2022	2/23/2022	2/23/2022	8/30/2022			
	Coterra	DEP	Coterra	Coterra	Coterra	Coterra	Coterra	DEP	Coterra	Coterra			
Results in mg/L unless otherwise noted.	raw	raw	raw	raw	treated	treated	raw	raw	raw	raw			**MCL/Standard**
Methane	**43**	**23.3**	**47**	**23**	0.360	0.210	**54**	**52**	**43**	**34**			**7
Ethane	0.450	0.309	0.460	0.350	<0.0050	<0.0050	0.790	0.691	0.700	0.400			No Standard
Propane	<0.0050	<0.0142	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	CNCLD	<0.0050	<0.0050			No Standard
Alkalinity	79	48.0	79	~	~	~	~	88.6	83	~			No Standard
Aluminum	0.24	**0.256000**	0.24	~	~	~	~	**1.220000**	**0.81**	~			0.2
Arsenic	<0.0020	<0.00300	<0.0020	~	~	~	~	0.004010	0.0033	~			*0.010
Barium	0.036	0.033	0.034	~	~	~	~	0.045	0.041	~			*2
Bromide	<0.50	<0.2	<0.50	~	~	~	~	<0.2	<0.50	~			No Standard
Calcium	35	34.880	35	~	~	~	~	35.700	37	~			No Standard
Hardness	110	104	110	~	~	~	~	107	110	~			No Standard
Iron	**0.67**	**1.773**	**1.2**	~	~	~	~	**2.690**	**2.1**	~			0.3
Lithium	<0.050	<0.0250	<0.050	~	~	~	~	<0.0250	<0.050	~			No Standard
Magnesium	3.9	4.22	4.0	~	~	~	~	4.37	4.4	~			No Standard
Manganese	0.053	**0.075**	**0.058**	~	~	~	~	**0.092**	**0.079**	~			0.05
pH (units)	7.4	7.0	7.3	~	~	~	~	7.2	7.5	~			6.5-8.5
Potassium	1.0	1.05	0.97	~	~	~	~	1.42	1.2	~			No Standard
Selenium	<0.0010	<0.00400	<0.0010	~	~	~	~	<0.00400	<0.0010	~			*0.05
Sodium	14	13.69	15	~	~	~	~	13.50	14	~			No Standard
SPC (µS/cm)	280	279.00	280	~	~	~	~	280	280	~			No Standard
Strontium	0.25	0.246	0.24	~	~	~	~	0.247	0.25	~			No Standard
Total Chloride	32	29.04	30	~	~	~	~	30.45	30	~			250
TDS	120	166	150	~	~	~	~	172	130	~			500
Total Sulfate	9.0	8.60	8.9	~	~	~	~	8.91	9.3	~			250
TSS	<3.4	<20	8.0	~	~	~	~	44	4.2	~			No Standard
Turbidity (NTU)	19	21.00	19	~	~	~	~	47.80	35	~			No Standard
Zinc	0.011	<0.0300	0.013	~	~	~	~	<0.0300	0.015	~			5

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

CID# 364626	8/5/2011	11/17/2021	11/29/2021	1/24/2022	3/10/2022	3/10/2022	3/14/2022	6/6/2022	6/9/2022	7/14/2022	7/14/2022	8/30/2022	
Results in mg/L unless otherwise noted.	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra	DEP	DEP	Coterra	Coterra	Coterra	
	raw	raw	raw	raw	raw	treated	treated	raw	raw	raw	treated	raw	**MCL/Standard**
Methane	0.027	5.9	1.5	**37**	4.6	1.3	6.3	3.57	2.76	6.4	3.2	**17**	**7
Ethane	<0.025	0.045	0.013	0.430	0.053	<0.0050	0.087	0.0516	0.0321	0.046	0.033	0.270	No Standard
Propane	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0142	<0.0142	<0.0050	<0.0050	<0.0050	No Standard
Alkalinity	~	~	~	~	120	100	~	134.8	134.4	120	120	120	No Standard
Aluminum	~	~	~	~	<0.025	0.067	~	0.021300	<0.0150	<0.030	0.041	<0.030	0.2
Arsenic	~	~	~	~	<0.0020	0.0086	~	<0.00300	<0.00300	<0.0020	<0.0020	<0.0020	*0.010
Barium	~	~	~	~	0.17	0.15	~	0.202	0.199	0.20	0.18	0.20	*2
Bromide	~	~	~	~	<2.5	<0.50	~	<0.2	<0.2	<0.50	<0.50	<0.75	No Standard
Calcium	~	~	~	~	35	30	~	38.700	39.100	39	39	37	No Standard
Hardness	~	~	~	~	130	110	~	121	122	150	140	130	No Standard
Iron	~	~	~	~	**1.2**	<0.050	~	0.179	0.306	0.32	<0.050	**1.1**	0.3
Lithium	~	~	~	~	<0.050	<0.050	~	<0.0250	<0.0250	<0.050	<0.050	<0.050	No Standard
Magnesium	~	~	~	~	5.6	5.8	~	5.81	5.82	5.5	5.3	5.6	No Standard
Manganese	~	~	~	~	**0.11**	0.0060	~	**0.093**	**0.093**	**0.085**	0.0039	**0.12**	0.05
pH (units)	7.78	~	~	~	7.8	8.1	~	8.0	8.2	7.8	7.7	~	6.5-8.5
Potassium	~	~	~	~	1.4	1.5	~	1.53	1.50	1.4	1.4	1.4	No Standard
Selenium	~	~	~	~	<0.0010	<0.0010	~	<0.00400	<0.00400	<0.0010	<0.0010	<0.0010	*0.05
Sodium	~	~	~	~	11	12	~	11.10	11.40	12	12	11	No Standard
SPC (µS/cm)	186	~	~	~	270	250	~	279.00	274.00	270	270	~	No Standard
Strontium	~	~	~	~	0.54	0.52	~	0.571	0.571	0.55	0.54	0.54	No Standard
Total Chloride	~	~	~	~	6.6	10	~	6.49	5.51	5.8	10	<7.5	250
TDS	~	~	~	~	140	130	~	160	162	140	130	140	500
Total Sulfate	~	~	~	~	9.9	3.6	~	8.49	8.40	8.5	8.9	8.6	250
TSS	~	~	~	~	<4.2	<4.1	~	<20	<20	<3.9	<4.0	<3.6	No Standard
Turbidity (NTU)	~	~	~	~	12	<1.0	~	1.40	1.29	2.0	<1.0	8.6	No Standard
Zinc	~	~	~	~	<0.010	0.024	~	<0.03000	<0.03000	<0.010	<0.010	0.012	5

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

CID# 364626	8/30/2022	4/3/2023	4/3/2023	6/12/2023	9/28/2023	9/28/2023	10/27/2023	10/27/2023	3/5/2024				
	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra	Coterra				
Results in mg/L unless otherwise noted.	treated	raw	treated	raw	raw	treated	raw	treated	raw				MCL/Standard
Methane	4.2	**11**	1.9	**17**	**16**	4	**15**	~	**13**				**7
Ethane	0.065	0.120	<0.0050	0.200	0.180	0.036	0.150	~	0.150				No Standard
Propane	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	~	<0.0050				No Standard
Alkalinity	110	120	120	~	120	120	~	~	130				No Standard
Aluminum	0.031	<0.030	<0.030	~	<0.030	<0.030	<0.100	<0.100	<0.030				0.2
Arsenic	<0.0020	<0.0020	<0.0020	~	<0.0020	<0.0020	<0.0025	<0.0025	<0.0020				*0.010
Barium	0.18	0.20	0.18	~	0.20	0.16	0.219	0.191	0.22				*2
Bromide	<0.75	<0.75	<0.75	~	<0.75	<0.75	~	~	<3.8				No Standard
Calcium	38	38	40	~	37	38	37.9	39.4	38				No Standard
Hardness	150	150	130	~	120	120	~	~	120				No Standard
Iron	<0.050	0.099	<0.050	~	**0.72**	<0.050	<0.200	<0.200	**0.46**				0.3
Lithium	<0.050	<0.050	<0.050	~	<0.050	<0.050	0.0150	0.0139	<0.050				No Standard
Magnesium	5.8	5.9	5.8	~	5.9	5.8	6.17	6.15	5.9				No Standard
Manganese	<0.0020	**0.094**	<0.0020	~	**0.19**	0.014	**0.226**	<0.0200	**0.28**				0.05
pH (units)	~	~	~	~	~	~	~	~	8.2				6.5-8.5
Potassium	1.4	1.5	1.4	~	1.5	1.4	1.56	1.54	1.4				No Standard
Selenium	<0.0010	<0.0010	<0.0010	~	<0.0010	<0.0010	<0.0025	<0.0025	<0.0010				*0.05
Sodium	12	12	12	~	11	12	12.7	13.1	11				No Standard
SPC (µS/cm)	~	~	~	~	~	~	~	~	~				No Standard
Strontium	0.53	0.56	0.56	~	0.55	0.54	0.614	0.596	0.56				No Standard
Total Chloride	20	5.9	9.6	~	8.5	12	~	~	7.2				250
TDS	130	150	150	~	190	110	~	~	100				500
Total Sulfate	7.4	8.2	8.3	~	8.0	8.0	~	~	7.6				250
TSS	<3.6	<3.0	<3.0	~	<3.0	<3.0	~	~	<3.0				No Standard
Turbidity (NTU)	<1.0	1.2	<1.0	~	7.1	<1.0	~	~	2.9				No Standard
Zinc	<0.010	<0.010	<0.010	~	<0.010	0.28	<0.0200	<0.0200	<0.010				5

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