



September 19, 2024

CERTIFIED MAIL NO. [REDACTED]

[REDACTED]

Re: Water Supply Request for Investigation ID: 360890
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 water supply located at the above-referenced address (“Water Supply”) from oil and gas activities. The Department 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.

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.). None of the parameters in the Water Supply were above a MCL or SMCL; however, certain samples were above a DEP Action Level, as set forth in the table below.

Parameters	Unit	Statewide Standards or Recommended Levels	Your <u>Highest</u> Sample Results that Were Detected Above Statewide Standards/Levels
Methane	mg/L	7 (DEP Action Level)	23

Summary of Investigation

On December 4, 2021, the Department was notified that methane was detected in your Water Supply during sampling being conducted as part of a nearby gas migration investigation. Subsequently, water quality samples were collected from the Water Supply 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 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 isotope and compositional analyses indicate that the stray gas in your Water Supply appears to be associated with oil and gas activities.

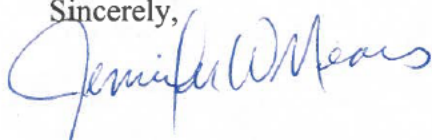
Methane is the predominant component of natural gas. Federal water standard limitations have not been established for methane gas. The level of concern begins above 28 mg/L methane, which is referred to as the saturation level. At this level, under normal atmospheric pressure, the water cannot hold additional 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. Note that methane has not been detected in your Water Supply at greater than 7 mg/L since sampling conducted in August 2022. 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 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 File # 360890

CID# 360890	12/3/2021		12/13/2021		12/13/2021		1/6/2022		1/6/2022		1/10/2022		1/10/2022		2/16/2022		2/16/2022		2/23/2022		8/25/2022		8/25/2022		3/30/2023		
	raw	Coterra	raw	DEP	raw	DEP	raw	DEP	raw	Coterra	raw	DEP	raw	Coterra	treated	Coterra	raw	Coterra	treated	Coterra	raw	Coterra	treated	Coterra	raw	Coterra	
Results in mg/L unless otherwise noted.	16	17.7	20	15.2	16	19.9	18	22	23	21	23	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Methane	0.110	0.194	0.160	0.1075	0.150	0.238	0.180	0.230	0.220	0.210	0.230	0.180	0.230	0.011	0.011	0.220	0.210	0.011	0.011	0.220	0.210	0.011	0.011	0.220	0.210	0.011	0.011
Ethane	<0.005	<0.0142	<0.005	<0.0142	<0.005	<0.0142	<0.005	<0.005	<0.0142	<0.005	<0.0142	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Propane	~	59.0	56	59.8	53	57.8	51	54	56	56	57.8	51	54	65	65	56	56	65	65	56	56	65	65	65	65	65	65
Alkalinity	~	0.049800	0.082	0.038800	0.054	0.050400	0.090	0.061	0.034	0.034	0.061	0.090	0.061	0.11	0.11	0.034	0.034	0.11	0.11	0.034	0.034	0.11	0.11	0.034	0.034	0.11	0.11
Aluminum	~	<0.00300	<0.0020	<0.00300	<0.0020	<0.00300	<0.0020	<0.0020	<0.00300	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Arsenic	~	0.049	0.049	0.052	0.052	0.044	0.052	0.052	0.052	0.052	0.044	0.052	0.052	0.056	0.056	0.051	0.051	0.056	0.056	0.051	0.051	0.056	0.056	0.051	0.051	0.056	0.056
Barium	~	<0.2	<0.50	<0.2	<0.50	<0.2	<0.50	<0.50	<0.50	<0.50	<0.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromide	~	27.330	28	27.600	26	25.160	26	27	28	27	25.160	26	27	30	30	28	28	30	30	28	28	30	30	30	30	30	30
Calcium	~	81	85	82	81	75	79	78	84	84	75	79	78	86	86	84	84	86	86	84	84	86	86	86	86	86	86
Hardness	~	0.148	0.10	<0.100	0.069	<0.100	0.075	0.11	0.090	0.090	<0.100	0.075	0.11	0.09	0.09	0.090	0.090	0.09	0.09	0.090	0.090	0.09	0.09	0.09	0.09	0.09	0.09
Iron	~	<0.0250	<0.050	<0.0250	<0.050	<0.0250	<0.050	<0.050	<0.050	<0.050	<0.0250	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lithium	~	3.15	3.0	3.07	2.9	2.88	3.0	3.0	3.2	3.0	2.88	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Magnesium	~	<0.010	0.0034	<0.010	0.0023	<0.010	0.0028	0.0030	0.0028	0.0028	<0.010	0.0028	0.0030	0.0043	0.0043	0.0028	0.0028	0.0043	0.0043	0.0028	0.0028	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
Manganese	~	7.0	7.0	6.8	6.9	6.8	6.8	6.9	7.1	6.8	6.8	6.8	6.9	7.9	7.9	7.1	7.1	7.9	7.9	7.1	7.1	7.9	7.9	7.9	7.9	7.9	7.9
pH (units)	~	<1.00	0.97	<1.00	0.98	<1.00	0.94	0.92	0.94	0.94	<1.00	0.94	0.92	0.94	0.94	1.0	1.0	0.94	0.94	1.0	1.0	0.94	0.94	0.94	0.94	0.94	0.94
Potassium	~	<0.00400	<0.0010	<0.00400	<0.0010	<0.00400	<0.0010	<0.0010	<0.0010	<0.0010	<0.00400	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Selenium	~	9.99	10	11.40	11	9.72	11	9.2	9.6	9.2	9.72	11	9.2	10	10	9.6	9.6	10	10	9.6	9.6	10	10	10	10	10	10
Sodium	~	220.00	220	229.00	230	220.00	220	200	220	220	220.00	220	200	210	210	220	220	210	210	220	220	210	210	210	210	210	210
SPC (µS/cm)	~	0.262	0.27	0.269	0.26	0.242	0.26	0.26	0.26	0.26	0.242	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Strontium	~	24.85	23	27.37	30	25.44	27	21	23	25	25.44	27	21	23	23	25	25	23	23	25	25	23	23	23	23	23	23
Total Chloride	~	134	130	134	95	128	120	110	95	95	128	120	110	71	71	95	95	71	71	95	95	71	71	71	71	71	71
TDS	~	8.25	8.4	8.49	8.4	8.07	8.2	8.1	8.6	8.6	8.07	8.2	8.1	4.6	4.6	8.6	8.6	4.6	4.6	8.6	8.6	4.6	4.6	4.6	4.6	4.6	4.6
Total Sulfate	~	<20	<3.0	<20	<3.7	<20	<3.8	<4.2	<3.7	<3.7	<20	<3.8	<4.2	<3.9	<3.9	<3.7	<3.7	<3.9	<3.9	<3.7	<3.7	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9
TSS	~	2.60	1.9	1.62	1.8	1.98	1.8	1.8	2.3	2.3	1.98	1.8	1.8	2.3	2.3	1.6	1.6	2.3	2.3	1.6	1.6	2.3	2.3	2.3	2.3	2.3	2.3
Turbidity (NTU)	~	<0.0300	<0.010	<0.0300	<0.010	<0.0300	<0.010	<0.010	<0.010	<0.010	<0.0300	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Zinc	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

~ = 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# 360890	3/30/2023		6/1/2023		6/1/2023		9/6/2023		11/29/2023		11/29/2023		3/25/2024		MCL/Standard
	Coterra	treated	Coterra	raw	Coterra	treated	Coterra	treated	Coterra	raw	Coterra	treated	Coterra	raw	
Results in mg/L unless otherwise noted.															
Methane	0.310	63	~	~	66	65	63	64	66	64	66	66	64	64	No Standard
Ethane	<0.0050	0.062	~	~	0.091	0.062	0.056	0.13	0.066	0.13	0.066	0.066	0.13	0.13	No Standard
Propane	<0.0050	<0.0020	~	~	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	*0.010
Alkalinity	0.056	0.056	~	~	0.059	0.051	0.056	0.058	0.049	0.058	0.049	0.049	0.058	0.058	*2
Bromide	0.75	0.75	~	~	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	No Standard
Calcium	35	35	~	~	33	34	32	31	33	31	33	33	31	31	No Standard
Hardness	110	110	~	~	99	100	94	91	96	91	96	96	91	91	No Standard
Iron	0.074	0.074	~	~	0.24	0.061	0.14	0.27	0.082	0.27	0.082	0.082	0.27	0.27	0.3
Lithium	<0.050	<0.050	~	~	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	No Standard
Magnesium	4.1	4.1	~	~	3.8	3.8	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	No Standard
Manganese	0.0032	0.0032	~	~	0.0094	0.0032	0.010	0.017	0.0031	0.017	0.0031	0.0031	0.017	0.017	0.05
pH (units)	~	~	~	~	~	~	~	~	~	~	~	~	~	~	6.5-8.5
Potassium	1.0	1.0	~	~	1.0	0.97	0.99	0.94	0.97	0.94	0.97	0.97	0.94	0.94	No Standard
Selenium	<0.0010	<0.0010	~	~	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	*0.05
Sodium	13	13	~	~	12	12	9.7	10	10	10	10	10	10	10	No Standard
SPC (µS/cm)	~	~	~	~	~	~	~	~	~	~	~	~	~	~	No Standard
Strontium	0.31	0.31	~	~	0.29	0.29	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	No Standard
Total Chloride	42	42	~	~	39	41	28	29	34	29	34	34	29	29	No Standard
TDS	140	140	~	~	140	170	130	160	140	160	140	140	160	160	250
Total Sulfate	9.2	9.2	~	~	8.2	8.5	7.5	7.5	7.4	7.5	7.4	7.4	7.5	7.5	500
TSS	<3.0	<3.0	~	~	3.5	<3.0	<3.2	3.0	<3.0	3.0	<3.0	<3.0	3.0	3.0	250
Turbidity (NTU)	3.2	3.2	~	~	6.8	2.2	3.8	10	2.7	10	2.7	2.7	10	10	No Standard
Zinc	0.063	0.063	~	~	0.024	0.030	0.017	0.010	0.019	0.010	0.019	0.019	<0.010	<0.010	5

~ = Not analyzed * Denotes Primary MCL < Indicates analyte was not detected above its detection limit.

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