pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

August 21, 2024

**CERTIFIED MAIL NO. 9589 0710 5270 1975 0617 34**

[redacted]

Re: Water Supply Investigation
DEP Identifier: 373431
Positive Determination -- 58 Pa. C.S § 3218
Cranberry Township, Venango County

Dear [redacted]

The Pennsylvania Department of Environmental Protection ("Department") has completed its investigation of your Water Supply illustrated on Figure 1 ("Water Supply"). Based on observations during the site visits, information provided by you, and the review of relevant documents, the Department has determined that the diminished Water Supply has most likely been impacted by oil and gas activity, in particular, the communication with 121-39241.

## CASE INFORMATION

| Date of Complaint | Nature of Complaint (odor, taste, quantity, use, color, gas) |
|---|---|
| June 30, 2023 | Diminution due to communication with a nearby oil well |

## INVESTIGATION SUMMARY

The Department was contacted on June 30, 2023 due to the diminution of your Water Supply. It was believed that the diminution could be due to a possible communication with a nearby oil well. Water could be heard running into a nearby oil well ("121-39241"), and when water was no longer heard running into the oil well, you reported that you would lose water.

The Department visited the site on July 11, July 19, and August 8, 2023 to conduct interviews and collect water samples. The water well was reported to be 300'-350' deep with the pump at approximately 300'. You also reported that the water was high in iron and has an oily odor when using hot water. There is an inline filter and water softener from Keystone Water Systems ("Keystone") to treat the water. The water well was purged for five minutes to conserve water; however, the pressure tank cycled twice within that five minutes. A water sample was collected before treatment and sent to Bureau of Laboratories ("BOL") for SAC946 and METH analysis. The water was reddish and cloudy with some sediment. No odor or gas was detected.

On July 11, 2023, you escorted Department staff to the oil well that was observed to have water running into it ("121-39241"). Water was heard cascading into the well. A Solinst Interface Meter was used to determine the water level in the water well and 121-39241. The water level in the water well was 168.15' below top of casing ("btoc") and the water level in 121-39241 was 176' btoc. Based on the water cascading into 121-39241, it is believed that the casing is compromised and is thieving water from the aquifer to a level that impacts the Water Supply. Figure 2 is a cross-section illustrating the water level between the two wells at the time of the Department's site visit. A water sample was bailed out of 121-39241 and sent to BOL for SAC946 and METH analysis.

**WATER SAMPLE RESULTS**

| Parameter Tested | MCL | Solle_WW 7/11/23 | Bailed from 121-39241 8/8/23 |
|---|---|---|---|
| Alkalinity (mg/l) | | 28.4 | 8.8 |
| Aluminum (µg/l) | 200 | **440** | <15 |
| Arsenic (µg/l) | 10 | <3.00 | <3.00 |
| Barium (mg/l) | 2 | 0.193 | 0.538 |
| Bromide (mg/l) | | 0.502 | 2.294 |
| Calcium (mg/l) | | 12.70 | 32.37 |
| Chloride (mg/l) | 250 | 59.90 | **276** |
| Hardness (mg/l) | | 71 | 183 |
| Iron (mg/l) | 0.3 | **37.20** | **68.74** |
| Lithium (µg/l) | | 46 | 51 |
| Magnesium (mg/l) | | 9.54 | 24.71 |
| Manganese (mg/l) | 0.05 | **1.78** | **3.549** |
| pH | 6.5 - 8.5 | **5.6** | **6.0** |
| Potassium (mg/l) | | 2.66 | 2.99 |
| Selenium (µg/l) | 50 | <4.0 | 6.82 |
| Sodium (mg/l) | | 10.60 | 67.64 |
| Specific Cond (µS/cm) | | 268 | 932 |
| Strontium (mg/l) | | 0.088 | 0.200 |
| Sulfate (mg/l) | 250 | 11.49 | 7.21 |
| TDS (mg/l) | 500 | 174 | **636** |
| TSS (mg/l) | | 87 | 463 |
| Turbidity (NTU) | 1* | **81.50*** | **1220*** |
| Zinc (µg/l) | 5,000 | <30.0 | <30.0 |
| Methane (mg/l) | 7** | 0.015 | 0.0216 |
| Ethane (mg/l) | | <0.0124 | <0.0124 |
| Propane (mg/l) | | <0.0142 | <0.0142 |

**BOLD**- Outside of Drinking Water MCL's
* Only applicable to unfiltered surface water sources
** DEP Action Level
NA- Not Analyzed

Aluminum, Iron, Managanese, and pH were above Department's Division of Drinking Water Management Maximum Conaminant Levels ("MCLs"). The elevated levels of Aluminum, Iron, and Manganese detected in the water well could be due to the many abandoned oil wells near the water well.

A sample was bailed from 121-39241 to better help determine if fresh water was entering the well bore. 121-39241 had many of the constituents that are typically seen in production fluid elevated above MCL, however, it would have been expected that a sample of production fluid bailed from an oil well would have significantly higher concentrations of these parameters, in particular: Aluminum, Barium, Bromide, Calcium, Chloride, Sodium, Specific Conductance, and TDS. All of the sample results have been attached.

During the initial investigation of 121-39241, the Department also observed additional oil wells and associated tank batteries throughout the review area and on property owned by the complainant ("Additional Wells"). These Additional Wells are situated within an oil and gas lease of one operator. Department staff inspected 121-39241 and the Additional Wells to determine compliance with Department rules and regulations. The Department observed several violations during the inspection of 121-39241. A copy of the inspection report is attached for reference. Some of the Additional Wells were found to be actively producing and others were found to be abandoned. Multiple violations were noted during the inspection of the Additional Wells. Subsequently, on March 11, 2024, the Department issued an Administrative Order to the operator of 121-39241 and the Additional Wells. The Administrative Order requires the operator to complete specific corrective actions to bring the 121-39241 well and the Additional Wells into compliance with the Oil and Gas Act, the Solid Waste Management Act, and the Clean Streams Law. The operator has appealed the administrative order to the Environmental Hearing Board.

Based on observations during the site visits, information provided by the complainant, and the review of relevant documents, the Department has determined that your diminished Water Supply was most likely impacted by oil and gas activity, in particular, the communication with 121-39241.

Please contact Alicia Furey at 814.332.6132 if you have any questions about the Department's determination regarding the Water Supply.

Sincerely,

*Scott M. Dudzic*

Scott M. Dudzic
Northwest District Oil and Gas Manager
District Oil and Gas Operations

Enclosures:
Figure 1 -2
Interpreting Water Supply Results

cc: Joe Lichtinger (via email)
Alicia Furey (via email)
Paul Strobel (via email)
Jennifer McDonough (via email)

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**Figure 1-2**