pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL & GAS MANAGEMENT

September 9, 2011

CERTIFIED MAIL: 7003 2260 0000 3136 1064

Mr. Loren Kiskadden
771 Banetown Rd
Washington, PA 15301

Re: Water Supply Complaint

Dear Mr. Kiskadden:

Since early June 2011, DEP has been investigating your complaint that Range Resources-Appalachia LLC's ("Range") activities have contaminated your water supply. We have concluded our investigation and cannot make the determination, for the reasons summarized below, that the problems in your water well are caused by gas well related activities, particularly those at the Yeager well site operated by Range.

Your water well is located over 2500 feet away from the Yeager gas well and impoundment. We were not able to obtain complete information about the construction of the water well, with depth estimates ranging from 200-400 feet. Regardless, the hydrology does not support a link between the water well and the Yeager gas well. From a geologic examination of the area, the likely recharge area for your water supply was identified to be in a northwesterly direction, whereas the Yeager well site is located to the northeast of your water well. Communication between the Yeager well site and your water well would not be expected.

Sampling of your water well was done both by Range (June 9 and July 27, 2011) and DEP (June 6, 2011). Similar results were generated, and I have included a copy of the data with this letter. Your water supply has a high pH (8.4-9.1) and high levels of total dissolved solids ("TDS") at 670-1120 milligrams per liter ("mg/l") and sodium (about 300 mg/l). Range also identified dissolved methane gas in the water well at a concentration of 7.8-18.5 mg/l. Very low concentrations of several organic compounds were reported in the DEP sampling: butyl alcohol, chloroform, and acetone. Your water is also bacteriologically contaminated as evidenced by the high levels of coliform bacteria that were detected. In this regard, our inspection of your water well suggested faulty construction in that surface water could be entering the well bore.

TDS is a measure of what is dissolved in water, including inorganic salts and organic compounds. There is no Maximum Contaminant Level (MCL) established for this parameter, as the EPA has not concluded that high TDS necessarily constitutes a health problem. However, a Secondary Maximum Contaminant Level (SMCL) has been set for TDS; this value is 500 mg/l, and it relates to aesthetic impacts such as taste and staining. Concerning your water supply, the elevated TDS over the SMCL is primarily a result of the high alkalinity (554-612 mg/l) and sodium concentrations.

Although no MCL or SMCL has been established for sodium, the recommended limit is 20 mg/l. High sodium concentrations might be an issue for anyone suffering from heart or kidney problems.

Gas well waste fluids are high in many parameters, including sodium and TDS. However, they characteristically show the highest concentration in chloride, usually 2-3 times that of sodium. Your water supply shows a chloride concentration of between 33 and 44 mg/l, or about 1/8 of the sodium level. This fact alone largely rules out gas well contamination at your well. Rather, the high sodium in your water supply would appear to be the result of a "natural softening" phenomenon in which sodium naturally occurring in the ground replaces calcium, magnesium, and other cations in the groundwater, much as a commercial water softener functions. This condition usually occurs in groundwater environments that have a high pH and alkalinity, which is the case with your water supply. Through our numerous samplings of water supplies, we have seen many cases of natural softening throughout this region. The absence of elevated concentrations of other gas well related parameters is strong evidence that drilling and fracking activities are not the source of the high sodium levels in your water well.

The methane gas in your water well was clearly identified through isotopic analysis to be drift gas, not natural gas that would be coming from a gas well. Drift gas is produced by the bacteriological conversion of carbon dioxide into methane, a well-documented occurrence in southwestern Pennsylvania and across the country. Isotopic analysis is a definitive test for identifying the source of underground gas, and there can be little doubt that the methane in your water well is not coming from the Yeager gas well or any other natural gas source.

The three hydrocarbons detected at low levels are common reagents in laboratories, are used as solvents and cleaning agents and can be found in groundwater throughout Pennsylvania where there has been residential or industrial development. Whether they are an artifact of washing glassware and lab equipment or some background level of contamination cannot be determined. Moreover, we are also concerned about potential surface runoff entering your well, and we observed that a "junkyard" was located upgradient from your water supply. However, as indicated above, the topography and hydrology of the area do not point to the Yeager well site as a source.

In summary, DEP has determined that the high levels of sodium and dissolved solids in your water supply, as well as the presence of dissolved methane, are not the result of Range's actions at the Yeager well site, or any other gas well related activities. Neither the hydrogeologic nor analytic results support a link between gas well related activity and your water well and point rather to natural conditions as the source of these problems.

We strongly recommend that you maintain a vent on your water well. This will prevent the build-up of methane concentrations in the well bore that might be caused by any de-gassing from the water into the head-space. However, the levels of dissolved gas in the water are not at a concentration that would pose a safety problem in your house, and methane gas is not harmful to ingest.

Fortunately the quality problems in the supply can be treated. A suitable aeration system could remove most of the dissolved methane. While your water might be satisfactory for bathing and cleaning purposes, a reverse osmosis unit plumbed into kitchen faucet, for example, could remove the TDS, including sodium, which would bring these parameters within the SMCL and recommended level for consumption. We also emphasize the need for some form of disinfection to address the coliform bacteria problem in the well.

If you wish to discuss these findings and conclusions further, please feel free to contact me at 412-442-4006 or via email at aeichler@pa.gov.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

Sincerely,

Alan J. Eichler
Program Manager
Oil and Gas Management

Enclosure

cc: (w/enc.)
John Smith, Esquire
Kendra Smith, Esquire
Oil and Gas File
Jack Crook
Vince Yantko
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AJE:rp