Pavillion Groundwater Report Fact Sheet
December 16, 2015

Key Findings

- Based on the Wyoming Department of Environmental Quality's (DEQ's) June and August 2014 sampling of the 13 water supply wells, other than a pesticide (beta-BHC) and bis (2-ethylhexyl phthalate), no organic compounds were identified over applicable drinking water standards. Phthalate is used as a plasticizer in flexible PVC plastics and is a common laboratory contaminant.

    - Inorganic compounds that were found over applicable drinking water standards are generally associated with naturally occurring salts, metals and radionuclides. Industrial applications may use some of these same compounds (e.g. oil and gas drilling mud contains chloride and potassium).

    - All organic constituents identified in groundwater samples at concentrations less than drinking water standards or comparison values may have originated from a multitude of possible sources, including spills, oil and gas activities, and other residential and industrial uses.

- Evidence does not indicate that hydraulic fracturing fluids have risen to shallow depths intersected by water supply wells. Also, based on an evaluation of hydraulic fracturing history, and methods used in the Pavillion Gas Field, it is unlikely that fracturing has caused any impacts to the water-supply wells.

- Gas in the Wind River Formation appears to have originated mainly from upward migration from deeper gas-bearing zones.

    - Evidence suggests that upward gas seepage (or gas charging of shallow sands) was happening naturally before gas well development.

- Some gas wells are experiencing slow gas seepage that could possibly have caused changes in water quality. The relative contribution of potential gas seepage along gas wells versus natural upward migration of gas is undefined and would be very difficult to quantify.

    - Water quality in the intermediate zones is expected to be different than in the shallow water-bearing zones, such as higher dissolved solids concentrations, therefore communication between the two zones could introduce water of poorer quality into the shallow water-bearing zones.

    - Bradenhead pressures in several gas wells provide strong indication that gas and possibly liquid migration may be happening, however, there is no evidence this migration has caused water quality issues.

- The presence of bacteria in many of the water-supply wells suggests that this may be a cause of taste and odor issues.
    - Geochemical changes associated with the biodegradation of dissolved organic compounds, including naturally occurring organic compounds, likely have produced constituents associated with poor water palatability, and appear to be linked to declining well yields.
    - Further investigation of bacterial types and sources is recommended.
- This project followed the process outlined in the June 20, 2013 Framework Agreement.

Considerations for additional work

- Expanded evaluation of identified groundwater constituents, including bacteria, which can cause palatability issues.
- Focused assessment of the potential for gas seepage along gas wells versus naturally occurring upward seepage of gas, as well as evaluating conditions that might allow the potential movement of liquid and/or gas from intermediate zones pressurized by gas into shallower permeable zones.
- Further evaluation of the surface pits and their potential impact on water quality.
- Further evaluation of other potential sources of petroleum hydrocarbons such as drill cuttings disposal sites and gas production and gathering facilities.
- Additional sampling for five specific chemical constituents to achieve lower maximum detection limits.

Next Steps

- The DEQ will accept public comment through March 18, 2016, a 90 day comment period.

- The WDEQ will accept written comments or electronic comments submitted through its online public comment page.

- The WDEQ will work through the public comment process to determine what further steps are necessary. The comments will be considered and addressed, and a final report will be published.

- A mid to late January 2016 meeting for the Pavillion Working Group is anticipated. This meeting is intended to provide an update to the Working Group and an opportunity for the public to obtain clarification that may be useful in the review and development of comments on the draft report.

- Copies of the draft report will be available on WDEQ's website on Friday December 18, 2015.

Additional Information

- Over 11,700 analytical results reviewed, only eight (8) of which were rejected.

- The final draft report, including lab results, is over 80,000 pages.

- Well owners, whose wells were sampled as part of this investigation, were provided a copy of the analytical results from June and August 2014 as soon as the data and results were validated. The analytical results were also recently provided to the US EPA so they could begin their peer-review process. Other parties were given the data based on FOIA requests.

- The cost for this most recent phase of the Pavillion Investigation will exceed $900,000.