North American
COALBED METHANE FORUM

Coal Seam Gas
Quarterly
Newsletter

Volume 7, Issue 1 January 2018

The holidays have passed and winter has set in. It is an opportune time to reflect on life and living. Our work and professional interests bear on our lives; therefore, contemplation also extends to our livelihoods – the business of energy, including coalbed methane/coal mining operations. This quarter's newsletter presents a variety of topics for your reflection and that will likely bear on industry through 2018 and beyond. The Board is also pleased to announce its technical forum set for springtime. We look forward to your participation in this annual event.

John R. Duda
Managing Editor
John.duda@netl.doe.gov

MARK YOUR CALENDARS: APRIL 18, 2018

The North American Coalbed Methane Forum will hold its 58th forum on Wednesday April 18, 2018 at the Hilton Garden Inn Southpointe, 1000 Corporate Drive, Canonsburg, PA 15317.

For agenda and registration information, please contact Dr. Kashi Aminian at 304-293-3964 (kaminian @wvu.edu). For forum sponsorship and advertising, contact Ms. Beth De Maagd at 412-389-8467 (demaagd consulting@gmail.com). Additional information is also available at the Forum's website www.nacbmforum.com.

Coal Production

The Energy Information Administration publishes its weekly coal production report each Thursday. https://www.eia.gov/coal/production/weekly/ For the week ending January 20, 2018, estimated coal production totaled approximately 14.6 million tons, which is almost 9% higher than the prior week's estimate. Coal production east of the Mississippi River totaled 5.9 million tons while 8.8 million tons was produced west of the river. Year-to-date coal production totaled 38.7 million tons. Looking back on 2017, U.S. coal production totaled 786* million tons (reported in Monthly Energy Review, released January 26, 2018), which is almost 8% higher than coal production reported for 2016. [*includes refuse recovery] https://www.eia.gov/totalenergy/data/monthly/index.php#coal

Coal and Natural Gas Outlook

The Energy Information Agency's latest edition of its Short Term Energy Outlook (STEO) was published on January 9, 2018 and includes forecasts for 2019. https://www.eia.gov/outlooks/steo/
A few highlights from the recent STEO include:

- Henry Hub natural gas spot prices are forecast to average $2.88 per million British thermal units (MMBtu) in 2018 and $2.92/MMBtu in 2019, compared with the 2017 average of $2.99/MMBtu.
- Dry natural gas production is forecast to average 80.4 billion cubic feet per day (Bcf/d) in 2018, a 6.9 Bcf/d increase from the 2017 level, which would be the highest year-over-year increase on record. Forecast dry natural gas production increases by an average of 2.6 Bcf/d in 2019.
- Coal production increased by 45 million short tons (MMst) (6%) in 2017 in response to high demand for U.S. coal exports. Coal production is forecast to decline by 14 MMst (2%) in 2018 and by 18 MMst (2%) in 2019, as export demand is expected to slow and natural gas prices are expected to stay below $3/MMBtu during much of the forecast period, which contributes to less coal use for electricity generation.
- EIA expects the share of U.S. total utility-scale electricity generation from natural gas to rise from 32% in 2017 to 33% in 2018 and to 34% in 2019, as a result of low natural gas prices.

Ventilation Air Methane (VAM)

The U.S. Environmental Protection Agency has updated it 2010 publication, *U.S Underground Coal Mine Ventilation Air Methane Exhaust Characterization.* The VAM data included in the August 2017 report consists of shaft-specific data from 2011-2015 for the gassiest mines in the U.S., based on reported 2015 emissions. The data are derived from annual reports submitted to EPA's Greenhouse Gas Reporting Program (GHGRP).

In 2015 alone, 220 underground mines released 84.3 billion cubic feet (Bcf) of methane from ventilation shafts, equating to 65 percent of all methane produced by active underground coal mines. From 2011 to 2015, the data indicate that both ventilation and degasification emissions have been decreasing year by year. This reduction is largely due to the restructuring of the coal industry that has occurred since 2010, resulting in increased mine closures and reduced methane emissions. Emissions, however, are not decreasing at the same rate as mine closures. Since 2008, the number of U.S. mines has decreased by over 47 percent, while VAM emissions have experienced a 16 percent decline. This is because most of mine closures are smaller room-and-pillar mines, while the principal contributors for the majority of CMM emissions are the large, high-production long-wall mines. Eighty-four billion cubic feet of methane is worth $250 million (@ $3/Mcf) and in terms of CO2e emissions, yields the same annual CO2e emissions as almost 10,000 MWe of coal generating capacity. How's that for perspective?

https://www.epa.gov/sites/production/files/2016-03/documents/vam-exhaust-characterization-july2010.pdf

Fracturing Operations on Federal Lands

The Bureau of Land Management issued a final rule that rescinded an earlier rule, "Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands" (2015 rule) as the Bureau has determined that it imposed administrative burdens and compliance costs that are not justified. The 2015 rule was intended to: Ensure that wells are properly constructed to protect water supplies, make certain that

the fluids that flow back to the surface as a result of hydraulic fracturing operations are managed in an environmentally responsible way, and provide public disclosure of the chemicals used in hydraulic fracturing fluids.

On March 28, 2017, President Trump issued Executive Order 13783, entitled, "Promoting Energy Independence and Economic Growth" (82 FR 16093, Mar. 31, 2017), which directed the Secretary of the Interior to review four specific rules, including the 2015 rule, for consistency with the policy set forth in section 1 of the Order.

On July 25, 2017, the BLM proposed to rescind the 2015 final rule because it believed that rule was unnecessarily duplicative of state and some tribal regulations and imposed burdensome reporting requirements and other unjustified costs on the oil and gas industry.

Review by the BLM indicated that resource damage is unlikely to increase by rescinding the 2015 final rule because of the rarity of adverse environmental impacts that occurred from hydraulic fracturing operations since promulgation of the 2015 rule. The BLM now believes that the appropriate framework for mitigating these impacts exists through state regulations, through tribal exercise of sovereignty, and through BLM's own pre-existing regulations and authorities (pre-2015 rule 43 CFR subpart 3162 and Onshore Orders 1, 2, and 7).

This final rule became effective on December 29, 2017.

https://www.federalregister.gov/documents/2017/12/29/2017-28211/oil-and-gas-hydraulic-fracturing-on-federal-and-indian-lands-rescission-of-a-2015-rule

Multi-seam Well Testing

A new method for evaluating production from multiple coal seams has been published by a research team affiliated with Virginia Polytechnic Institute and State University. The testing protocol is described in the paper by Ripepi et al. and is titled, "**Determining Coalbed Methane Production And Composition from Individual Stacked Coal Seams in a Multi-Zone Completed Gas Well".** Verbatim, the abstract is as follows: **"**This work proposes a novel and cost-effective approach to determine coalbed methane (CBM) production and composition from individual coal seams in a multi-zone completed CBM well. The novel method uses water to cover individual coal seams in a low pressure CBM well followed by an Echometer fluid level survey to determine the water level. Corresponding gas flow measurements and natural gas chromatography analysis are used to determine gas production and composition from unique zones. A field test using this technology is conducted in Central Appalachia for a multi-zone CBM well containing 18 coal seams. Test results show that the shallow coal seams contribute the majority of the total CBM production in this multi-zone well, and the deeper coal seams contain more heavy hydrocarbons like ethane and propane." The paper is available online at www.mdpi.com/1996-1073/10/10/1533/pdf .

FORUM'S MISSION STATEMENT

THE NORTH AMERICAN COALBED METHANE FORUM WAS ESTABLISHED IN 1985 TO ADVANCE MINE SAFETY AND TO INCREASE PRODUCTION OF COALBED METHANE AS A WORLD-WIDE ENERGY RESOURCE. THE FORUM PROVIDES AN OPPORTUNITY FOR AN EXCHANGE OF INFORMATION ON COALBED METHANE RESEARCH AND TECHNOLOGY BETWEEN THE PUBLIC AND PRIVATE INDUSTRY SECTORS.