

December 16, 2013

Natural Gas Trends

Highlights

USGS to aid study of quake-injection well link

A recent swarm of earthquakes northwest of Fort Worth, Texas, has prompted an upcoming study by scientists affiliated with the US Geological Survey to determine if the temblors are related to hydraulic fracturing and/or wastewater injection wells in the area. In the past month, residents in the small towns of Azle and Springtown have been shaken by about 20 minor earthquakes, the strongest of which measured 3.6 on the Richter scale – a level at which shaking is noticeable but that rarely causes damage. They occurred in the midst of the Barnett Shale gas play near six active and two inactive wastewater injection wells.

Rob Williams, a USGS geophysicist, said Friday that the USGS has sent four seismographs to researchers at Southern Methodist University in Dallas to monitor the region and collect data on future quakes. The SMU researchers also are expected to study the possible relationship between seismic activity and gas and oil operations in the region. Williams said that although it is “a little unusual” to have such a high level of seismic activity in that part of North Texas, it is too early to establish a direct correlation between quakes and fracking injection wells – “but we have to consider that possibility.” Williams said it is well-known that the injection of fluids deep underground has caused earthquakes in the past. Previous studies have pointed to a connection between quakes in North Texas and the presence of nearby wastewater disposal wells (GD 10/3/12).

“It’s something to consider for the oil and gas business. In the past, in cases where wastewater injection appears to contribute to causing earthquakes, the fluids got into a fault and reduced friction on the fault and led to earthquakes,” Williams said. One problem with assessing the situation is that the nearest permanent USGS station is nearly 60 miles away from the Azle area where the recent quakes occurred. “It’s difficult to get accurate earthquake locations at that distance,” he said. “By putting these four seismographs near where the swarm is occurring, we’ll be able to get better locations, better estimates of magnitudes. We don’t know if there are any active faults in that region, but it’s very likely there are faults, old faults, in the crust. We want to know if one of these has reactivated.” Williams said there is a lot of uncertainty as to where the inactive faults might be located, and whether these faults could become reactivated by the injection of fluids into them. “It would help to know if there is a fault that has gotten going but it’s not the final answer that everybody needs to know,” Williams said.

In an interview Monday, Azle Mayor Alan Brundrett said that if the SMU study connects the quakes near his city to the nearby injection wells, he would call on state regulators to close the wells down. “If in fact the earthquakes are being caused by injection wells, which we don’t know at this point, I would think the injection wells need to be stopped, before somebody gets hurt or before there’s property damage,” he said. Brundrett said that although up to now the quakes have not caused any property damage in his town, they seem to be continuing and may be a gaining in strength. A 3.6 earthquake shook the small city in the early hours of Sunday, and a 3.7 quake occurred near the town of Mineral Wells about 40 miles west of Azle, he said. The mayor said he hopes the seismographic equipment SMU installs will help to pinpoint the exact location of any future quake “to see where they are in relation to the location of wastewater wells.” He said he plans to draft a letter to the Railroad Commission of Texas calling for a study of the relationship between earthquakes and disposal wells.

RRC spokeswoman Ramona Nye said commission staff “are not conducting any studies regarding seismic activity and injection wells ... our staff are closely following various studies that are being conducted to determine possible manmade causes of recent seismic events. When earthquakes are reported, our staff will determine if saltwater disposal wells are nearby and then inspect the facilities to ensure that they are in compliance with their Railroad Commission permit conditions,” Nye said. In late November, following the reports of nearby quakes, RRC staffers inspected one Azle-area disposal well and found it in compliance with RRC rules, she said.

Williams noted that the USGS is not a regulatory agency like the RRC, but a scientific one. “So we’re just trying to provide the scientific information as best we can about magnitudes, locations and the kinds of events relating to the geology in the area. It will be up to other people to decide what to do with that information. Source: Platts Gas Daily

Data

- January 2014 Natural Gas Futures Contract (as of December 13), NYMEX at Henry Hub closed at \$4.351 per million British thermal units (MMBtu)
- January 2014 Light, Sweet Crude Oil Futures Contract WTI (as of December 13), closed at \$97.58 per U.S. oil barrel (Bbl.) or approximately \$16.82 per MMBtu

Last week: Texas cooler than normal

For the week beginning 12/8/13 and ending 12/14/13, heating degree days (HDD) were higher than normal (cooler) for the week and year to date for both Texas and the US.

Source: www.cpc.ncep.noaa.gov

HEATING DEGREE DAYS (HDD)				
City or Region	Total HDD for week ending 12/14/13	*Week HDD +/- from normal	Year-to-date total HDD	* YTD % +/- from normal
Amarillo	224	31	1284	2%
Austin	175	88	585	45%
DFW	209	86	735	23%
El Paso	155	17	635	-16%
Houston	141	62	458	22%
SAT	132	49	430	11%
Texas**	171	70	657	28%
U.S.**	229	51	1302	3%

* A minus (-) value is warmer than normal; a plus (+) value is cooler than normal. NOAA uses 65° Fahrenheit as the ‘normal’ basis from which HDDs are calculated. ** State and U.S. degree days are population-weighted by NOAA.

-999 = Normal Less Than 100 or Ratio Incalculable

Last week: U.S. natural gas storage at 3,533 Bcf

For the week ending 12/06/2013 working gas in storage decreased from 3,614 Bcf to 3,533 Bcf. This represents a decrease of 81 Bcf from the previous week. Stocks were 273 Bcf lower than last year at this time and 109 Bcf below the 5 year average of 3,642 Bcf.

Source: <http://ir.eia.gov/ngs/ngs.html>

U.S. WORKING GAS IN STORAGE				
Region	Week ending 12/06/13	Prior week	One-week change	Current Δ from 5-YR Average (%)
East	1,815	1,861	-46	-7.8%
West	504	530	-26	4.3%
Producing	1,214	1,223	-9	2.7%
Lower 48 Total	3,533	3,614	-81	-2.8%

Lower 48 states, underground storage, units in billion cubic feet (Bcf)

Last week: U.S. gas rig count down for the week

The gas rig count for the U.S. was down six compared to the prior week and down 47 when compared to twelve months ago. The total rig count for the U.S. was up seven for the week and down 17 when compared to twelve months ago. The total rig count includes both oil and natural gas rotary rigs.

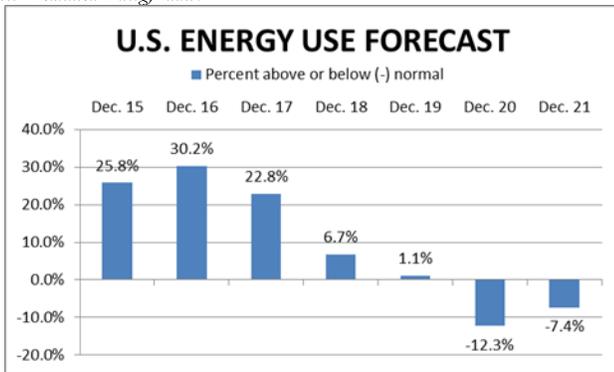
Source: Baker Hughes

BAKER HUGHES ROTARY RIG COUNT				
	As of 12/13/2013	+/- prior week	Year ago	+/- year ago
Texas	848	6	848	0
U.S. gas	369	-6	416	-47
U.S. oil	1411	14	1381	30
U.S. total	1782	7	1799	-17
Canada	426	24	418	8

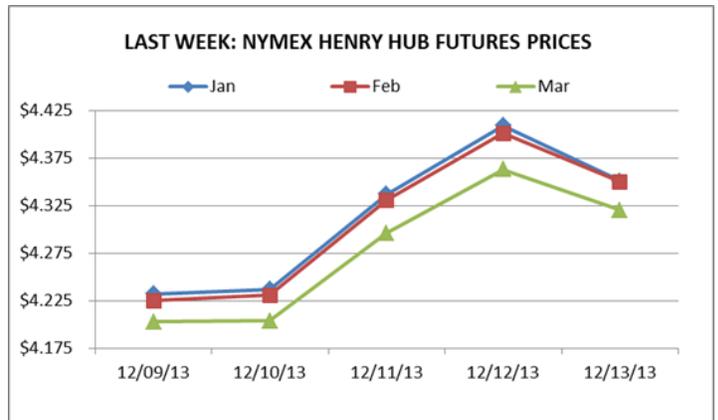
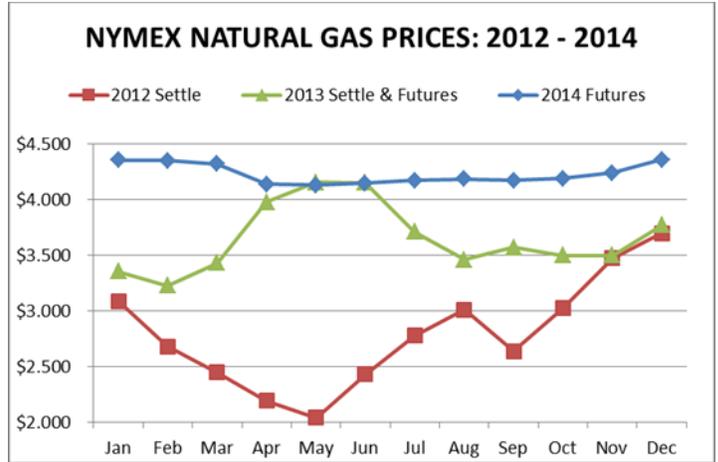
This week: U.S. energy use varies

U.S. energy use is predicted to be above normal for most of the week, according to the Dominion Energy Index, as shown below. Dominion forecasts total U.S. residential energy usage, a component of which is natural gas.

Source: Dominion Energy Index



2013 prices. Natural gas prices for 2013, shown below in green, are the NYMEX settlement prices for January-December.



NATURAL GAS PRICE SUMMARY AS OF 12/13/2013

	This Week	+/- Last Week	+/- Last Year	12-Month Strip Avg.
US January futures				
NYMEX	\$4.351	\$0.237	\$0.997	\$4.228