GAS STORAGE

A critical asset for the natural gas industry

BY BETH R. MINEAR, ESQ.

Although natural gas was a recognized resource as early as the 1600s, the first well wasn't drilled until 1821 by William Hart in Fredonia, New York. For almost the next century, gas was largely produced and used on demand, with gas shortages common in the winter heating months and price fluctuations based upon the laws of supply and demand. In 1915, the first natural gas storage field was completed in Welland County, Ontario, with the U.S. close behind in completing the Zoar field in Buffalo, New York the following year. The ability to store surplus production in the summer months for withdrawal during the winter months stabilized the gas industry.

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For federally-regulated gas storage, these fields are covered by the Natural Gas Act and considered as part of gas transmission like pipelines and other assets. For intra-state or otherwise state-regulated gas storage, the public service commissions that are responsible for rates and regulation have storage field oversight.

The Business Need for Storage

In addition to domestic availability and price stability, gas storage can be seen as the unsung hero of the natural gas industry as a whole. Production wells would need to be shut in if there was nowhere to store the surplus in summer months and many leases provide that the lease is lost if a well is shut in longer than a certain amount of time. In this era of shale, losing leases can be a business killer for many small companies. With the downturn of coal and the comparatively inexpensive increased use of natural gas to fuel electric generation, having sufficient gas storage for peak electric seasons has driven up the need for storage.

July 2016 was the first storage withdrawal in the summer since 2006, largely due to gas-fed electric generation and increasing pipeline infrastructure. Also, many Americans have been looking to compressed natural gas vehicles as cleaner alternatives to gasoline, so refueling stations have been popping up even in the most rural of states. The need for gas storage will only continue to rise as companies switch to this environmentally-friendly fuel alternative.

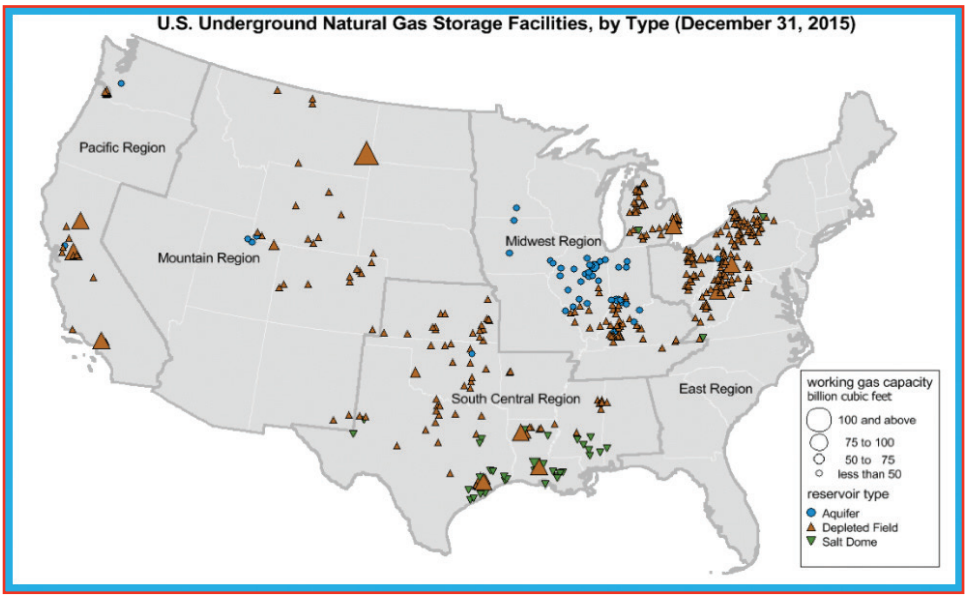
Storage Well Integrity Issues Prompting Renewed Focus

Although the Pipeline and Hazardous Materials Safety Administration (PHMSA) was aware that it needed to have additional integrity oversight for gas storage wells, the Aliso Canyon storage well leak in southern California gave regulators the push it needed. The leak was detected and reported on October 23, 2015 and wasn't contained until the well was plugged on February 18, 2016. While the PHMSA's primary focus has been on pipelines, there has been renewed interest in this this sub-subspecialty of the gas industry. From regulatory direction shifting to encompass natural gas storage, prudent land professionals will need to understand the basics of gas storage in order to support the efforts of companies that have storage. It's also the perfect time to highlight this little-understood area of right of way, and to understand why natural gas storage is the unsung hero of the industry. With approximately 413 storage fields nationwide—of which approximately 222 are regulated by the Federal Energy Regulatory Commission (FERC)—there is and will be a lot of work for the right of way industry and the clients we serve in the next few years.

Mechanics of Gas Storage

Contrary to popular belief, gas storage fields are not the large, man-made tank farms above ground, nor are they typically large tanks underground. Natural gas is generally stored in natural occurring subsurface formations. There are three types of underground gas storage

fields. The first are aquifers, which are water-bearing sands with gas trapped by impermeable rock. The second are salt caverns or "domes," which are hollowed out salt beds. The third are depleted production fields where the native oil or gas has been commercially produced, leaving behind the pore space to refill. Of the approximately 413 storage fields nationwide, approximately 333 are depleted production fields. Instead of being an empty cavern, the pore spaces in sedimentary rocks are now capable of holding injected storage gas for future use by customers.



Source: eia.gov

Right of Way

In topic discussions with right of way professionals, unless they work for or with a company that owns or operates storage, a frequent comment is that it's "landman work" tied to the mineral interests. Oddly, natural gas storage is *not* "landman work" and has little to do with the mineral interests. The storage rights remain with the surface owner if the mineral interests of oil and/or gas are severed, unless specifically granted as well. In my nearly 20 years of work with gas storage clients, I have only seen that twice in the thousands of storage land rights I have reviewed. There are dozens of subsurface, stratigraphic layers underground—some of which have been commercially depleted by production and may be suitable for reinjection of gas produced elsewhere. Each of these layers is a subsurface right of way, acquired, analyzed and disposed of in the same manner as surface rights of way.

And as with any right of way, the rights can be obtained by fee grant by the surface owner, by a permanent right of way for suitable strata, by a paid-up lease subject to termination, by yearly lease, or by any other form of grant. For the commercially depleted production fields in particular, these grants often include the rights to utilize any remaining native reserves, with or without additional payments. Right of way professionals must understand the basic terminology for storage interests and land rights in order to support the reservoir engineers and other technically skilled clients, whether internal or external.

Basic Gas Storage Terminology

As discussed, storage gas is not typically considered a mineral other than by scientific composition. The ability to specifically understand the differences among the jobs of different gas volumes will help land professionals support clients and negotiate with landowners. Gas stored is typically gas produced elsewhere, stripped of liquids and impurities and largely rendered "tariff-quality" for regulated use. Most states consider such gas as personal property due to the dominion exercised over it and no longer real property when stored. Gas storage companies charge customers to store the customers' gas and to withdraw when needed. Just like with pipelines, capacity to store can be firm or intermittent, depending upon agreements between the parties and under the regulatory tariffs.

This storage gas is then no longer categorized by molecule, but by volume of what fills the subsurface right of way. These volumes are broken down into the following types:

- Native Gas: Gas that was naturally occurring under the property, but left behind post-production. Often not commercially producible prior to storage conversion.
- Base/Cushion Gas: Can be part native gas, but largely gas injected into the storage easement to provide adequate pressure for working gas.
- Working Gas: Gas stored for use by customers that is injected and withdrawn based upon need and contract.

Now that we've defined the purposes for the gas in the storage fields, we need to look at the definition and description of the fields. Gas storage fields are defined by the rocks that contain them. Not following any surface boundaries or maps, the geological boundary that defines the field is the reservoir. Because storage gas can also escape its own reservoir boundary, most states have recognized and/or have allowed companies to identify buffers or setback areas to protect the reservoirs from gas migration or other loss. The wells that access the working gas in the reservoir are the injection and/or withdrawal wells, while the wells that typically monitor pressure and composition for potential breach and field health are the monitoring wells. The land rights held in the storage boundaries (reservoir or buffer) are sometimes improperly vested or may be lost due to a myriad of reasons. The unacquired tracts in storage fields are called "windows" or "outs."

Acquisition of Storage Rights

As discussed, acquisition of gas storage rights is little different than acquisition of surface rights. The storage rights are owned by the surface owners, even if the mineral rights have been severed. The need for acquisition is constant, as there can be dozens of outs in an existing field and hundreds of parcels to acquire for new fields. Since the year 2000, FERC has approved approximately 115 federal gas storage projects. The need for land professionals who have mastered this subspecialty of the natural gas industry is increasing.

For general field operations, the need to upgrade storage rights is ongoing. Existing rights may only have the right to drill one storage well, but another may be needed on a large tract. An existing lease may have no surface rights, but the storage company may need to drill a storage well. Clearly, expertise in surface negotiation is coupled with understanding of the subsurface.

In the area of valuation, payments for storage rights is vastly different than for surface acquisition. Going from the market value standpoint, there is no wide market for a subsurface storage easement. As storage is a regulated function of natural gas, the owners of a field certificated by state regulators or the FERC have the right to acquire rights by eminent domain in the unlikely event that negotiations fail. From these court cases across the United States, we see that many times landowners attempt to sway the fact-finders from market value and argue that the value should be aligned with the company need instead of the market as a whole. Time and again, this argument has failed, so unless there are remaining native reserves owned by the surface owners, the typical market value per acre is around $50.

PHMSA's New IFR

Effective January 17, 2017, PHMSA issued its Interim Final Rule (IFR) for natural gas storage to "address critical safety issues related to downhole facilities." The IFR applies to natural gas storage fields and imposes the American Petroleum Institute (API) Recommended Practices 1170 and 1171 for storage well integrity as to risk management, construction, maintenance and recordkeeping, among other requirements. While many meet and/or exceed API standards, storage companies will need to have procedures in place that address many factors including maintenance and physical site work activities. Storage Operators were required to submit the First Annual Report under the new regulations by March 15, 2018.

As PHMSA'S IFR mandates that downhole integrity issues must be assessed and addressed in the near term, land professionals may think that the work is for reservoir engineers or the operations, maintenance and integrity teams for storage companies. But that work cannot proceed without land professionals, as these companies will need support from right of way for follow through on compliance. From a property rights perspective, land professionals will need to coordinate with these internal technical departments to identify wells that may not be compliant and aid in planning for maintenance and site work activities to reach compliance.

In Summary

While storage is a less exciting topic than shale for some, those of us who understand the importance of gas storage and the impact that it has across multiple industries will appreciate the value of this silent workhorse. As companies with gas storage look to comply with PHMSA's IFR or to develop/expand storage fields, there is a firm place at the table for right of way professionals who know how to support the bigger picture. ✪

Beth Minear is the president of Global Project Solutions Consultants, LLC, a comprehensive project strategy, land acquisition and regulatory compliance company. She has also been a licensed attorney for more than 20 years, providing counsel and business advice to energy companies and utilities in state and federal courts in multiple jurisdictions.