

The US Government's Role in Providing Helium to Worldwide Markets

by Leslie Theiss

The Bureau of Land Management (BLM), an agency of the US Department of the Interior, is a major supplier of crude helium to refiners in the United States, who market and sell pure helium throughout the world. Managing the nation's Federal Helium Reserve was a quiet program until 2006, when shortages made news around the world.

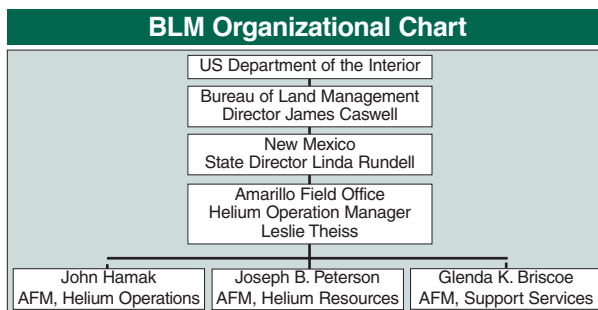
The BLM is America's largest 'landlord,' managing 258 million acres of federal public domain in 12 Western states, including Alaska. We also administer 700 million acres of sub-surface federal mineral estate (e.g., oil, gas, coal and helium) throughout the nation. Our mission is to sustain the health and productivity of these public lands for the use and enjoyment of present and future generations.

The BLM's role in helping meet the demand for helium by refiners in the private sector has expanded significantly even though crude helium from the Federal Helium Reserve was originally intended as a source of helium for US government agencies and as a backup supply to private helium refiners.

Right now, about 45 percent of US supply, and over a third of the world's supply of helium, comes from helium in this reserve, which stores about 22.8 billion cubic feet (Bcf) of helium. The BLM produces about 6.1 million cubic feet (MMcf) of helium per day — or 2.1 Bcf per year — which is delivered to private sector refiners along a 425-mile pipeline.

In terms of exports from the US to other countries, private sector helium shipments have increased over 50 percent since 2002 (see Figure 1). Helium exports will continue to escalate as worldwide demand for helium continues to increase. Based on export data for the first six months of the year, 2007 exports are expected to approach 2.5 Bcf (69.3 million cubic meters), a 12 percent increase over 2006 exports.

This growth in demand goes a long way towards explaining why helium shortages are occurring; worldwide demand has risen about seven percent a year in the past



three years while supplies of helium are stagnant.

Here's the crux of the issue: helium from BLM's Federal Helium Reserve is not 'new' helium; it is a supply that was built up from decades of federal helium conservation and storage programs. Obviously, this imbalance of supply and increased demand is not sustainable in the long term; additional sources of

helium are needed across the globe — and the sooner the better.

Let's take a closer look at the government's role in supplying crude helium to private refiners. The BLM owns and operates 23 wells in the Cliffside Gas Field, which stores the Federal Helium Reserve, about 15

miles northwest of Amarillo. The wells produce from the Bush Dome, a geologic structure that contains helium, natural gas and other gases, such as nitrogen. Gas from the wells is delivered to a Crude Helium Enrichment Unit (CHEU), which separates out the natural gas, helium, and other byproducts.

The BLM then produces and delivers crude helium (a gas containing 80 percent helium and other inert gases, such as nitrogen) to private refiners along a pipeline that runs from the CHEU northeast through the

panhandle of Oklahoma to Bushton, Kansas.

The most economically feasible source of helium is from natural gas. Some of the richest sources of helium in natural gas are in the mid-continent area of the United States, including the Texas Panhandle near

Amarillo. This area became the logical location for the federal helium program, by an Act of Congress in 1960, to ensure that helium would be conserved. The program also ensured an uninterrupted supply to meet government needs.

By the early 1990s, the Helium Program owed over \$1 billion to the US Treasury in principal and interest on funds it borrowed while setting up and managing the conservation program. Helium extraction from the Hugoton Field (a major supplier of helium) was decreasing as production peaked, and private refiners saw a need for additional supplies of crude helium

Total Sales of Grade-A Helium Produced in the United States
(Billion Cubic Feet) (14.7 psia and 70 F)

Year	Domestic Sales	Exports ¹	Total Sales	Helium Sold From Cliffside
2002	3.16	1.42	4.58	1.43
2003	2.91	1.49	4.40	1.27
2004	3.07	1.62	4.69	1.59
2005	2.95	1.85	4.80	2.06
2006	2.71	2.23	4.94	2.08

Figure 1

Source: BLM and US BuCen

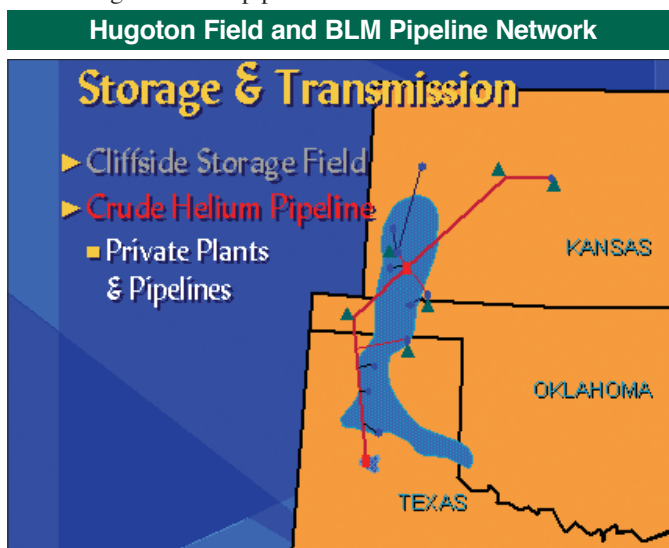


Figure 2

Source: US Bureau of Land Management

to be developed. Many in government and industry saw a need to change the mission of the program.

In 1996, Congress passed the Helium Privatization Act requiring the cessation of the government's helium refining capabilities, selling off the conservation helium in storage, continued operation of the storage and transportation of helium, and continued evaluation of the Nation's helium resources.

The BLM's job today is to ensure a steady supply of helium for government usage. We have a three-fold mission:

- Operate a helium storage facility and supply crude helium to private industry,
- Track and identify helium resources in the US, and
- Collect royalties on federal helium produced by private industry.

The BLM's Amarillo Field Office is not a typical federal operation because it does not rely on Congressionally appropriated funds. BLM operates via a government Public Enterprise Fund, which means operations are funded from the income received from the sale of crude helium and other program-related operations. Revenues in excess of amounts needed for operations are returned to the Treasury for repayment of debts incurred by the Helium Program. Since 2003, almost \$395 million has been returned to the US Treasury.

The BLM owns and operates the high-pressure underground pipeline that is used to deliver the crude helium produced by CHEU to the refiners along the pipeline. The BLM conducts both in-kind and open market sales of crude helium. The sale of in-kind helium to federal agencies with major helium requirements (200,000 cubic feet per location) is accomplished through federal helium suppliers. To sell helium to a federal agency, a helium supplier must be under contract with the BLM to purchase an amount of crude helium equivalent to the amount of refined helium it has supplied to the federal agency.

Both the federal agency and the federal helium supplier report the amounts sold and purchased to the BLM in Amarillo. BLM reconciles the amounts and then bills the federal supplier for an equivalent amount of crude helium. BLM transfers the crude helium to a federal helium supplier's storage account, after the supplier pays for the in-kind crude helium. Federal customers served by the BLM through this program include NASA, the US Air Force, the Department of Energy, National Institutes of Health, plus several national laboratories and universities.

The Helium Privatization Act (HPA) of 1996 also required the Department of the Interior to offer for sale 'Conservation Helium' stored at the Cliffside Field by 2005. The BLM began offering 2.1 Bcf



The Crude Helium Enrichment Unit (CHEU), which separates the natural gas, helium, and other byproducts out, came online in 2003 and is operated by BLM in partnership with the CRLP. Photo courtesy of BLM.

of helium for sale per year starting in 2003 to meet this requirement. Open market helium is offered for sale through an Invitation for Offer (IFO) every year in September. Companies that have a business interest in the helium industry request the amount of helium they would like to purchase each quarter. After the requests have been made, BLM figures the allotments and bills the companies for the amount of crude helium they are allowed to purchase. BLM transfers the crude helium to a helium storage account after they receive payment for the helium.

The Cliffside Refiners Limited Partnership (CRLP), a consortium of private sector refiners along the pipeline, designed and constructed the Crude Helium Enrichment Unit and additional compression equipment to enhance the processing of helium-bearing gas from the Cliffside Field for input in the Conservation Pipeline. The CHEU came online in 2003; it is operated by BLM in partnership with the CRLP.

The CHEU is operating at and above design parameters. It processes about 22 MMcf per day of natural gas blended feed from gas field wells to a helium content of about 28 percent. The crude helium product is produced and delivered into the conservation pipeline. A byproduct of the process is a residue of natural gas that is saleable. The bottom line for the CHEU is that it ensures that BLM can meet the requirements of the Helium Privatization Act for the drawdown of the Federal Helium Reserve.



The BLM uses gas chromatographs to analyze gas samples from throughout the United States and the world, as part of investigations of the occurrences of helium in natural gases of countries with free-market economies. Photo courtesy of BLM.

HELIUM RESOURCES EVALUATION

Until 1996, the BLM's Amarillo Field Office was part of the US Bureau of Mines, also in the Interior Department. The Bureau of Mines was abolished that year and its Helium Operations office was moved to the Bureau of Land Management. The office has been evaluating the helium resources of the United States for about 60 years. In conjunction with this activity, the government has also been conducting a helium survey program since 1917.

These programs are being conducted to: 1) ensure a steady supply of helium for Federal needs; 2) provide information to the Secretary of the Interior, so that helium on federal lands, which is reserved to the United States, can be properly managed; and 3) provide information to the public on a limited natural resource that is being depleted.

The last publication (<http://minerals.usgs.gov/minerals/pubs/commodity/helium/>) on helium resources of the United States was the 13th in a series of reports that were started in the mid-1970s; it covered helium resources of the US through December 31, 2002. The next scheduled report is currently being prepared and it will cover helium resources in the US through December 31, 2006.



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The helium survey program obtains and analyzes gas samples from throughout the United States and the world, as part of investigations of the occurrences of helium in natural gases of countries with free-market economies. Forty-four publications have presented the results of over 16,800 gas analyses performed through 2004. The analyses are from gas sampled from well owners that grant permission for publication. As of December 31, 2006, BLM Helium Operations analyzed a total of over 21,700 gas samples from 26 countries and the US. (http://www.blm.gov/nm/st/en/prog/energy/helium/helium_operators_information.html)

THE BOTTOM LINE

Worldwide demand for helium continues to increase, with demand rapidly outstripping supply. In addition, two overseas plants have not been functioning as originally projected over the last year. Any shutdowns of domestic crude helium plants, whether for annual maintenance or equipment failure, also impact helium supply. The result is that some users of helium (e.g., suppliers and retailers of party balloons) are not getting fully supplied and are paying premium prices.

Unless new helium supplies are found and/or overseas helium production output increases, the status quo cannot satisfy continuing helium demand throughout the world. Regardless, mid-continent gas field production continues to decline 6-7 percent a year as does its helium supply.

Estimated US Helium Consumption by End Use — 2006

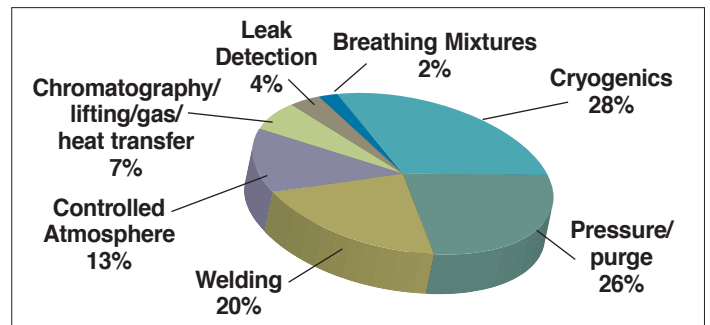


Figure 3

Source: BLM

The BLM does not control contracting terms or distribution of refined helium to federal or private consumers. Private industry refines the crude helium we supply and develops contracts, distribution and pricing.

We have no projection for an easing of the shortage. Clearly new helium sources, substitution, and conservation measures are needed to meet future demands.

Leslie Theiss is Manager of the Helium Operations Office for the Bureau of Land Management in the Amarillo Field Office. A graduate of California State University-Los Angeles, with a B.S. in Geology, Leslie has over 28 1/2 years of government service and has been with the BLM since 1987. In 2004, Leslie accepted the position of Field Manager of the Amarillo Field Office, which manages the Federal Helium Program. She can be reached at Leslie_Theiss@nm.blm.gov. □