



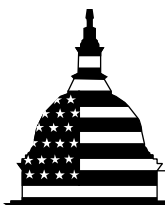
Testimony
Before the Committee on Natural
Resources, House of Representatives

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HELIUM PROGRAM

Urgent Issues Facing BLM's Storage and Sale of Helium Reserves

Statement of Daniel Garcia-Diaz, Director
Natural Resources and Environment



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Highlights of [GAO-13-351T](#), a testimony before the Committee on Natural Resources, House of Representatives

Why GAO Did This Study

The federal government has been extensively involved in the production, storage, and use of helium since the early part of the twentieth century. The federal helium program is currently managed by the Department of the Interior's BLM. During the 1960s and early 1970s, Interior purchased about 34 billion cubic feet of crude helium for conservation purposes and to meet federal helium needs, such as for the space program and scientific research. Crude helium is a gas of 50 to 85 percent helium. While some of this helium was used to meet federal needs, most of it was retained in storage. The funds used to purchase this helium became a debt owed by the program. BLM now sells crude helium from the reserve, and the proceeds go into the revolving Helium Fund, which is used to finance the program and payoff the program's debt.

GAO reported on the management of the helium program in the 1990s ([GAO/RCED-92-44](#) and [GAO/RCED-93-1](#)).

Since GAO's reviews of the program in the 1990s, key changes have affected the program, and a 2010 report by the National Academies' National Research Council concluded that it is time to reassess the program. GAO testified on the helium program in May 2010 ([GAO-10-700T](#)). This testimony is an update of GAO's May 2010 testimony and discusses (1) how the Helium Privatization Act of 1996 addressed issues raised by GAO in the 1990s and (2) three urgent issues facing the helium program in the near future.

GAO is not making any recommendations in this testimony.

View [GAO-13-351T](#). For more information, contact Daniel Garcia-Diaz at (202) 512-3841 or garciadiazd@gao.gov.

February 14, 2013

HELIUM PROGRAM

Urgent Issues Facing BLM's Storage and Sale of Helium Reserves

What GAO Found

Since GAO's reports in the early 1990s, the Helium Privatization Act of 1996 has caused considerable changes to the helium program and addressed or altered GAO's prior concerns. In 1992, GAO reported on various aspects of the federal helium program including the helium debt, pricing, and alternatives for meeting federal helium needs.

- *Helium debt.* In 1992, GAO recommended that Congress cancel the helium program's debt since doing so would not adversely affect the federal budget, as the debt consisted of outlays that had already been appropriated and interest that was a paper transaction. As of September 1991, this debt had grown to about \$1.3 billion, over \$1 billion of which was interest that had accrued on the original debt principal of about \$290 million. The 1996 act did not cancel the debt as GAO had recommended, but it did freeze the growth of the program's debt and, as a result, the debt should be paid off this year.
- *Helium pricing.* The helium debt was also a factor in setting the price of federal helium. In 1992, GAO recognized that, if the helium debt was cancelled, Congress might need to propose a new pricing scheme. The 1996 act requires a specific method for pricing helium. This, along with other changes in the supply and demand for helium, has resulted in the Bureau of Land Management's (BLM) price to be at or below the market price.
- *Alternatives for meeting federal helium needs.* In 1992, GAO recommended that Congress reassess the conservation objectives of the helium program and consider other alternatives to meet federal helium needs. In resetting the program's objectives, the 1996 act directed Interior to stop refining helium and established a modified in-kind approach for meeting federal helium needs. Agencies must purchase helium from refiners that then purchase an equivalent amount of crude helium from BLM.

Changes in the helium market have generated concerns about the future availability of helium for federal and other needs. The Helium Privatization Act of 1996 did not provide a specific direction for the federal helium program past 2015. Three urgent issues facing the program are as follows:

- *How will the helium program be funded after 2013?* If the helium program's debt is paid off this year, as expected, the revolving Helium Fund will be terminated as required by the 1996 act. When GAO last testified on this issue, the estimated payoff date was 5 years away in 2015. The schedule has accelerated primarily because of improved crude helium sales.
- *At what price should BLM sell its helium?* In the past, the debt has been a factor in the price, and the price has been above the market price. After 2013, the debt will be paid off, and the current price is at or below market.
- *How should the helium owned by the federal government be used?* BLM's effort to sell off the excess helium in storage will not be completed by January 1, 2015, as required by the 1996 act. As of September 30, 2012, there were 11.44 billion cubic feet of conservation helium in storage. After BLM is finished drawing down the reserve, some believe that the United States could become a net importer of helium.

Chairman Hastings, Ranking Member Markey, and Members of the Committee:

I am pleased to be here today to discuss the federal helium program currently managed by the Department of the Interior's (Interior) Bureau of Land Management (BLM). As you know, helium is an important nonrenewable natural resource that has a variety of uses. The federal government uses helium for, among other things, the space program, national security applications, and scientific research. For many of its uses, helium has no substitute.

During the 1960s and early 1970s, to fulfill the conservation objective of the Helium Act Amendments of 1960,¹ Interior purchased about 34 billion cubic feet of helium from private crude helium producers.² In the 1990s, we reported to, and testified before the Subcommittee on Energy and Mineral Resources on Interior's management of the federal helium program.³ In May 1993, we testified that Interior had enough helium in storage to meet federal needs until at least 2070 and that a reassessment of the objectives of the Helium Act was needed.

Since our reports in the early 1990s, key changes have affected the federal helium program, and a 2010 report by the National Academies' National Research Council concluded that it is time once again to reassess the program.⁴ We revisited our work from the 1990s, and we raised some issues facing BLM's helium program in our May 13, 2010, testimony before this Committee's Subcommittee on Energy and Mineral

¹Pub. L. No. 86-777, 74 Stat. 918 (1960), *codified as amended at* 50 U.S.C. §§ 167-167m.

²"Crude helium" is a gas containing approximately 50 to 85 percent helium.

³GAO, *Mineral Resources: Federal Helium Purity Should Be Maintained*, [GAO/RCED-92-44](#) (Washington, D.C.: Nov. 8, 1991); GAO, *Mineral Resources: Meeting Federal Needs for Helium*, [GAO/RCED-93-1](#) (Washington, D.C.: Oct. 30, 1992); GAO, *Mineral Resources: Meeting Federal Needs for Helium*, [GAO/T-RCED-93-44](#) (Washington, D.C.: May 20, 1993); GAO, *Mineral Resources: H.R. 3967 – A Bill to Change How Federal Needs For Refined Helium Are Met*, [GAO/T-RCED-94-183](#) (Washington, D.C.: Apr. 19, 1994); and GAO, *Terminating Federal Helium Refining*, [GAO/RCED-95-252R](#) (Washington, D.C.: Aug. 28, 1995).

⁴National Research Council, *Selling the Nation's Helium Reserve* (Washington, D.C.: National Academies Press, 2010).

Resources.⁵ My testimony today will describe (1) how the Helium Privatization Act of 1996 addressed issues we raised in the 1990s and (2) three urgent issues facing the helium program in the near future. This testimony summarizes and updates the information presented in our May 2010 testimony. Our May 2010 testimony was a performance audit conducted in accordance with generally accepted government auditing standards. A detailed description of our scope and methodology is presented in our May 2010 testimony.⁶

Background

Helium is an inert element that occurs naturally in gaseous form and has a variety of uses (see table 1).⁷ Helium's many uses arise from its unique physical and chemical characteristics. For example, helium has the lowest melting and boiling point of any element and, as the second lightest element, gaseous helium is much lighter than air.

⁵GAO, *Helium Program: Key Developments Since the Early 1990s and Future Considerations*, [GAO-10-700T](#) (Washington, D.C.: May 13, 2010). In addition, hearings were held in the U.S. Senate and the House of Representatives on helium in 2012. See, *Helium Stewardship: Hearing to Receive Testimony on S. 2374, The Helium Stewardship Act of 2012 Before the Senate Comm. on Energy and Natural Resources*, 112th Cong. (2012); and *Helium: Supply Shortages Impacting our Economy, National Defense and Manufacturing Oversight Hearing Before the Subcomm. on Energy and Mineral Resources of the House Comm. on Natural Resources*, 112th Cong. (2012).

⁶[GAO-10-700T](#).

⁷Helium in this statement refers to helium-4, the most abundant naturally occurring helium isotope. Helium-3, which has its own supply and demand issues, is not the focus of this statement. For additional information on helium-3, see GAO, *Technology Assessment: Neutron Detectors: Alternatives to Using Helium-3*, [GAO-11-753](#) (Washington, D.C.: Sept. 29, 2011), and GAO, *Managing Critical Isotopes: Weaknesses in DOE's Management of Helium-3 Delayed the Federal Response to a Critical Supply Shortage*, [GAO-11-472](#) (Washington, D.C.: May 12, 2011).

Table 1: Estimated Helium Uses in the United States, 2010

Category of use	Examples of applications	Amount used (million cubic feet)	Percentage
Cryogenics	Magnetic resonance imaging (MRI) Fundamental science Industrial cryogenic processing	480	26
Controlled atmospheres	Optical fiber manufacturing Semiconductor manufacturing	407	22
Pressure/purge	Space and defense rocket purging and pressurizing	314	17
Welding	Metal welding	314	17
Chromatography/ lifting gas/ heat transfer	Chromatography Weather balloons Military reconnaissance Heat transfer in next-generation nuclear reactors Party balloons	220	12
Leak detection	Leak detection	76	4
Breathing mixtures	Commercial diving	36	2
Total		1,846	100

Sources: U.S. Geological Survey's 2010 Minerals Yearbook and the National Research Council.

Note: Totals may not add because of rounding.

Certain natural gas fields contain a relatively large amount of naturally occurring helium, which can be recovered as a secondary product. The helium is separated from the natural gas and stored in a concentrated form that is referred to as crude helium because it has yet to go through the final refining process.⁸ The federal government has a reserve of crude helium that is stored in the ground in an area of a natural gas field that has a naturally occurring underground structural dome near Amarillo, Texas. In addition to the federal government's reserve of crude helium, private companies that are connected to BLM's pipeline and pay a storage fee, are also able to store and retrieve their own private crude helium reserves from the same storage area.

The federal government has been extensively involved in the production, storage, and use of helium since the early part of the twentieth century.

⁸Refined helium has a varying purity of 99.99 percent to 99.9999 percent helium.

The federal government and private sector cooperatively produced helium before 1925, specifically for military uses. The Helium Act of 1925,⁹ as amended, assigned responsibility for producing helium for federal users to Interior's Bureau of Mines.¹⁰ From 1937 until 1960, the Bureau of Mines was the sole producer of helium. The act provided that funds from helium sales be used to finance the program by establishing a revolving fund known as the helium production fund. Such revolving funds are used to finance a cycle of business-type operations by charging for the sale of products and then using the proceeds to finance their spending. In the federal budget, this fund is referred to as the Helium Fund, and it is used to account for the program's revenues and expenses.

The Helium Act Amendments of 1960 stipulated that the price of federal helium cover all of the helium program's costs, including interest on the program's debt. The 1960 act required the Secretary of the Interior to determine a value for net capital and retained earnings, establish this value as debt in the Helium Fund, and add subsequent program borrowings to that debt. The program's borrowings were authorized by subsequent appropriations acts and recorded as outlays in the federal budget in the years in which they were expended. In addition, the interest was added to the debt in the Helium Fund. However, this interest is simply a paper transaction, not a government outlay. The Bureau of Mines determined that the value of the program's net capital and retained earnings was about \$40 million in 1960. Subsequent borrowings from the U.S. Treasury totaling about \$252 million were used to purchase helium for storage. By September 30, 1991, the debt had grown to about \$1.3 billion, of which more than \$1 billion consisted of interest because the interest accrued faster than the program could repay the debt.

The Helium Privatization Act of 1996 significantly changed the objectives and functions of Interior's helium program.¹¹ For example, the 1996 act made the following key changes:

⁹Pub. L. No. 68-544, 43 Stat. 1110 (1925) (originally codified at 50 U.S.C. §§ 161-166 and currently codified as amended at 50 U.S.C. §§ 167-167m).

¹⁰The Bureau of Mines was established in 1910 and abolished in 1996. The helium program was transferred to BLM.

¹¹Pub. L. No. 104-273, 110 Stat. 3315 (1996), *codified at* 50 U.S.C. §§ 167-167m.

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- Interior was required to close all government-owned refined helium production facilities and to terminate the marketing of refined helium within 18 months of enactment (50 U.S.C. § 167b(b),(c));
 - the helium program's debt was frozen as of October 1, 1995 (50 U.S.C. § 167d(c));
 - Interior was required to offer for sale all but 600 million cubic feet of the crude helium in storage on a straight-line basis—a depreciation method that spreads out the cost of an asset equally over its lifetime—by January 1, 2015 (50 U.S.C. § 167f(a)(1));
 - Interior was required to set sale prices to cover the crude helium reserve's operating costs and to produce an amount sufficient to repay the program's debt. The price at which Interior sells crude helium was required to be equal to or greater than a formula that incorporates the amount of debt to be repaid divided by the volume of crude helium remaining in storage, with a consumer price index adjustment (50 U.S.C. §§ 167d(c), 167f(a)(3)). Furthermore, when the debt is fully paid off, the revolving Helium Fund shall be terminated (50 U.S.C. § 167d(e)(2)(B));
 - Interior was allowed to maintain its role in the helium storage business (50 U.S.C. § 167b(a)); and
 - established a modified “in-kind” program to meet federal needs for helium. Rather than purchasing refined helium directly from Interior, federal agencies were required to purchase their major helium requirements from persons who have entered into enforceable contracts to purchase an equivalent amount of crude helium from Interior (50 U.S.C. § 167d(a)).¹²

As directed by Congress, the National Academies' National Research Council reviewed the helium program and released a report in 2000 that evaluated the changes made in the program, the effects of these changes on the program, and several scenarios for managing the federal

¹²The term “person” means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, or state or political subdivision thereof. 50 U.S.C. § 167(2).

government's reserve of helium in the future.¹³ Because of subsequent changes in price and availability of helium, in 2008, the National Research Council convened a committee to determine if the current implementation of the helium program was having an adverse effect on U.S. scientific, technical, biomedical, and national security users of helium. The committee reported on these effects in early 2010 and concluded that the current implementation of the program has adversely affected critical users of helium and was not in the best interest of the U.S. taxpayers or the country.

The Helium Privatization Act of 1996 Addressed or Altered Our Prior Concerns

Since our reports in the early 1990s, the Helium Privatization Act of 1996 has caused considerable changes to the helium program and addressed or altered our prior concerns. In October 1992, we reported on various aspects of the federal helium program including the helium debt, pricing, and alternatives for meeting federal helium needs.¹⁴

Helium Debt

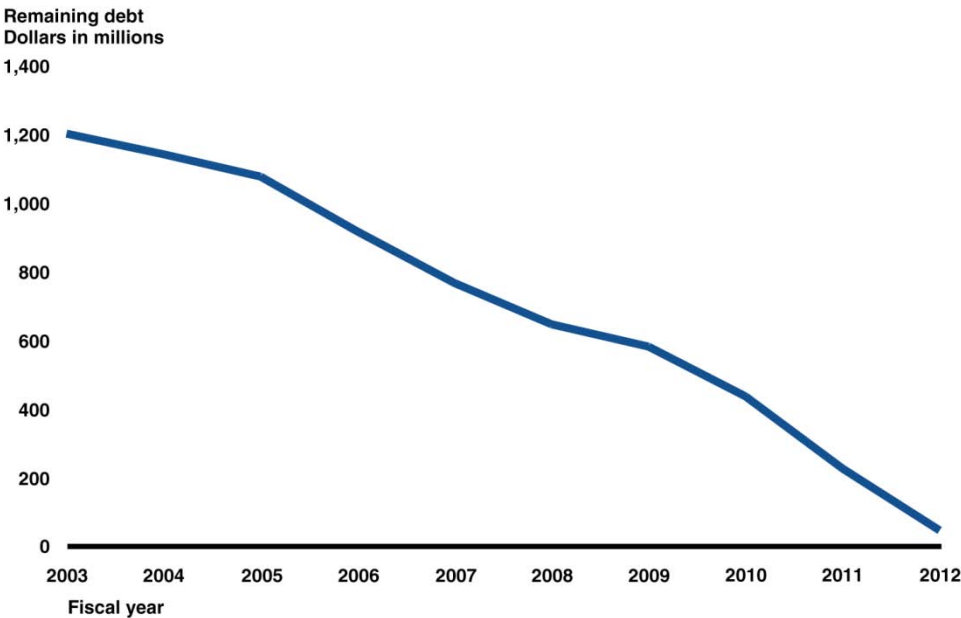
In October 1992, we recommended that Congress cancel the helium program's debt. As of September 1991, the debt had grown to about \$1.3 billion, over \$1 billion of which was interest that had accrued on the original debt principal of about \$290 million. At that time, the deadline for paying off the debt was 1995. We reported that the only way to pay off the debt by that deadline would be to charge federal agencies with major requirements for helium over \$3,000 per thousand cubic feet of helium, compared to the price at that time of \$55. We recommended that Congress cancel the debt in the Helium Fund because it was no longer realistic to expect the debt to be repaid by the statutory deadline of 1995, and because canceling the debt would not adversely affect the federal budget as the debt consisted of outlays that had already been appropriated and interest that was a paper transaction. The 1996 act did not cancel the debt, as we had recommended, but because the 1996 act effectively froze the debt at \$1.37 billion, and interest no longer accrued, BLM has been able to pay off a large portion of its debt. As of the end of

¹³National Research Council, *The Impact of Selling the Federal Helium Reserve* (Washington, D.C.: National Academy Press, 2000).

¹⁴[GAO/RCED-93-1](#).

fiscal year 2012, BLM had \$44 million in debt remaining, which according to BLM officials it expects to pay off this year (see fig. 1).

Figure 1: Balance of the Helium Debt, Fiscal Years 2003 through 2012

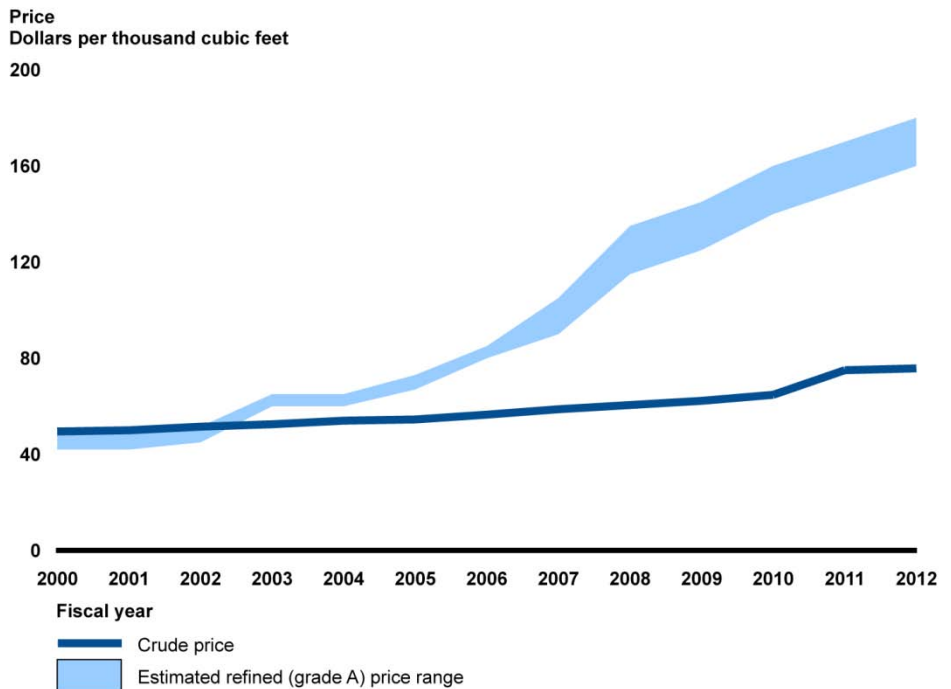


Source: BLM.

Helium Pricing

The helium debt was also a factor in setting the price of federal helium. In 1992, GAO recognized that if the helium debt was cancelled, Congress may wish to propose a new pricing scheme. The 1996 act did not cancel the debt, as we had recommended, but it did require a specific method for pricing crude helium. The initial minimum BLM selling price for crude helium after the act was passed was almost double the price for private crude helium at that time. However, after BLM started to sell its crude helium, according to the method specified in the act, the market price for crude and refined helium began to change. According to the National Research Council, the private sector began using the BLM crude price as a benchmark for establishing its price and, as a result, privately sourced crude helium prices increased and now they meet or exceed BLM's price. Increases in the price of crude helium have also led to increases in the price of refined helium (see fig. 2). Refined helium prices have more than tripled from 2000 through 2012 pursuant to demand trends.

Figure 2: BLM Crude Helium Price and Refined (Grade A) Price Estimates, Fiscal Years 2000 through 2012



Source: BLM.

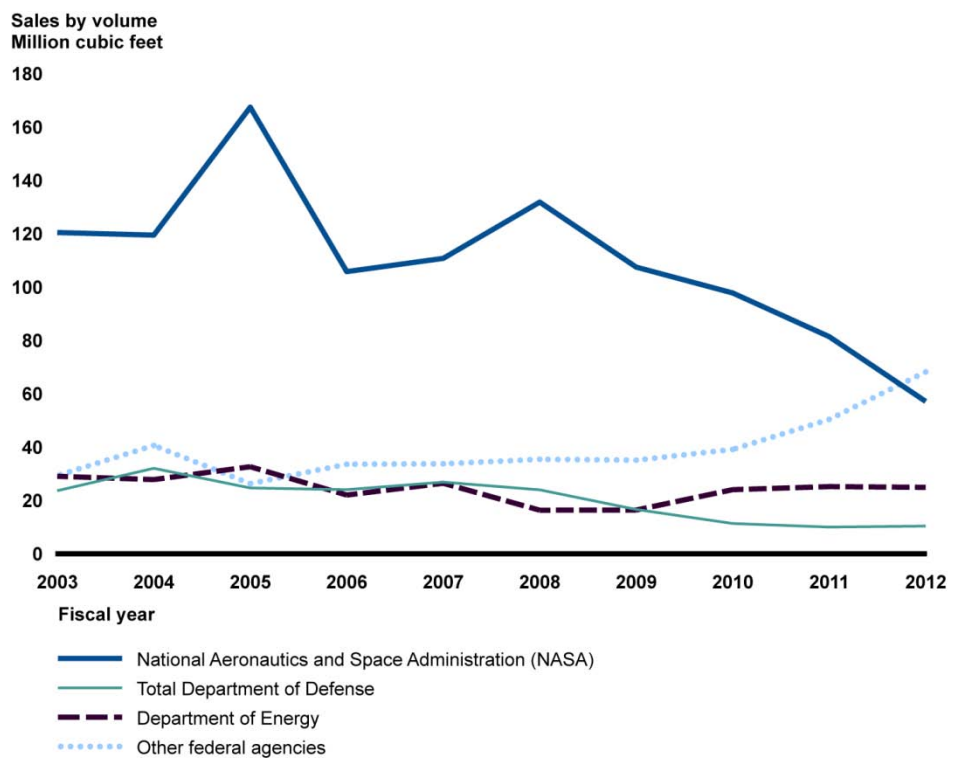
Note: For fiscal years 2000 through 2010, BLM had only one sale price for crude helium for both “in-kind” and “open market” sales. Beginning in fiscal year 2011, BLM instituted a new two-tier pricing system. The crude helium price used in the figure for fiscal years 2011 and 2012—\$75.00 and \$75.75 per thousand cubic feet, respectively—is the higher price for “open market” sales. The lower price for “in-kind” sales for fiscal years 2011 and 2012 was \$64.75 and \$65.50 per thousand cubic feet, respectively.

Alternatives for Meeting Federal Helium Needs

In 1992, GAO recommended that Congress reassess the conservation objectives of the helium program and consider other alternatives to meet federal helium needs. As part of the resetting of the helium program’s objectives, the 1996 act established a revised approach for meeting federal needs for helium. In 1998, BLM began using in-kind sales to federal agencies. The in-kind regulations established procedures for BLM to sell crude helium to authorized helium supply companies and required federal agency buyers to purchase helium from these approved

suppliers.¹⁵ Since the in-kind program started, the sales to federal agencies have fluctuated, primarily due to the National Aeronautics and Space Administration's unique requirement for large volumes of helium on a sporadic basis. Total federal in-kind sales for fiscal year 2012 were 160.67 million cubic feet (see fig. 3).

Figure 3: In-Kind Helium Sales by Federal Agency, Fiscal Years 2003 through 2012



Source: BLM.

Three Urgent Issues Facing the Helium Program

As we testified in 2010, changes in helium prices, production, and demand have generated concerns about the future availability of helium for the federal government and other critical purposes. The Helium Privatization Act of 1996 does not provide a specific direction for the helium program past 2015. As a result of these factors, in 2010, we identified three areas of uncertainty about the program's direction after

¹⁵43 C.F.R. Part 3195.

2015. The same three areas are even more urgent today because 3 years have passed since our 2010 testimony, and BLM's schedule for paying off the program's debt has accelerated. Specifically, the three urgent issues are as follows:

- *How will the helium program be funded after 2013?* If the helium program's debt is paid off this year, as expected, and the revolving helium fund is terminated, it is not clear how the operations of the helium program will be paid for. Currently the helium program does not receive any appropriated funds for its operations. The revenues generated by the program go into the Helium Fund, and the program has access to those funds to pay for its day-to-day operations. It is uncertain at this point how the helium program's operations will be funded after 2013. BLM is still evaluating possible options, but it may have to undertake an orderly shutdown of the helium reserve unless the revolving fund is not terminated or appropriated funds are available for crude helium sales and the operations of the reserve. When we last testified on this issue, the estimated payoff date was 5 years away in 2015, and it was more closely aligned with the 1996 act's requirement to sell down the helium reserve by January 1, 2015. The debt payoff schedule has accelerated primarily because of improved sales of the crude helium offered for sale. As a result, BLM's helium program will not have a funding mechanism for its continued operation until 2015. Furthermore, because of some years of slow sales, BLM estimates that it will need to continue helium sales from the reserve until sometime between 2018 and 2020 to reach the 1996 act's requirement to draw down to 600 million cubic feet.
- *At what price should BLM sell its crude helium?* Since the Helium Privatization Act of 1996 was passed, BLM has set the price for federal crude helium at the minimum price required by the act. However, because federal crude helium reserves provide a major supply of crude helium, we expect BLM's prices will continue to affect private industry market prices for crude and refined helium. When BLM first set its price after the 1996 act, its price was estimated to be significantly higher than the market price, but now the reverse is true—BLM's price for crude helium is estimated to be at or below the market price for refined helium. The 1996 act, like the Helium Act Amendments of 1960 before it, tied the price to the program's operating expenses and debt. If the debt is paid off in 2013, as projected, the debt will no longer be a factor in setting helium prices. BLM officials told us that the 1996 act sets a minimum selling price and that the Secretary of the Interior has the discretion to set a higher price. In response to a recommendation in the National Research

Council's 2010 report, beginning in fiscal year 2011, BLM implemented a new two-tiered pricing system. Under the new pricing system, in-kind sales involving federal agencies continued to be based on the minimum selling price set in the 1996 act, while other sales to nongovernmental entities are charged a higher price based on debt repayment and cost recovery factors.¹⁶ The new pricing system, however, is still not a market-based pricing system. In November 2012, Interior's Office of Inspector General recommended that BLM implement a new helium pricing process by the end of 2013 to ensure a fair return on the sale of helium.¹⁷

- *How should the helium remaining in storage after 2015 be used?* The Helium Privatization Act of 1996 required BLM to offer for sale substantially all of the helium in storage by January 1, 2015. While the required amounts have been offered for sale, only 79 percent of the amounts offered for sale have actually been sold (see table 2). BLM will likely still have significantly more crude helium in storage than the 600 million cubic feet required by the 1996 act. As of September 30, 2012, there were 11.44 billion cubic feet of conservation helium in storage.¹⁸ According to the 2010 report by the National Academies' National Research Council, the United States could become a net importer of helium within the next 7 to 12 years, and the principal new sources of helium will be in the Middle East and Russia. Given these circumstances, the National Academies' report recommended that Congress may want to reevaluate how the domestic crude helium reserve is used or conserved. It is uncertain at this point how the helium still remaining in storage after January 1, 2015, will be used.

¹⁶According to BLM officials, federal agencies must negotiate their own purchasing contacts directly with an authorized helium supply company. BLM does not track the price negotiated and paid by federal agencies. The authorized helium supply companies are required to purchase the same amount of helium, by volume, as sold to federal agencies. The price that the companies pay to buy the crude helium from BLM for these transactions involving federal agency sales is the "in-kind" sales price.

¹⁷Department of the Interior, Office of Inspector General, *Bureau of Land Management's Helium Program*, C-IN-MOA-0010-2011 (Washington, D.C.: Nov. 9, 2012).

¹⁸According to BLM, the native natural gas in the reserve contains an additional 2.44 billion cubic feet of helium.

Table 2: Actual and Projected Crude Helium Sales, Fiscal Years 2003 through 2013**Amounts in millions of cubic feet**

Fiscal year	Amount offered for sale	Amount sold	Amount not sold	Percentage sold
Actual sales through December 2012				
2003	1,640	1,640	0	100
2004	2,100	675	1,425	32
2005	2,100	1,390	710	66
2006	2,100	1,565	535	75
2007	2,100	2,030	70	97
2008	2,100	1,638	462	78
2009	2,100	925	1,175	44
2010	2,100	2,100	0	100
2011	2,100	2,100	0	100
2012	2,100	2,100	0	100
2013 (1st quarter of fiscal year)	525	525	0	100
Subtotal	21,065	16,688	4,377	79
Projected sales				
2013 (last three quarters of fiscal year)	1,575	1,575	0	100
Total	22,640	18,263	4,377	81

Source: BLM.

Note: At the end of fiscal year 2012, there were 11.44 billion cubic feet of conservation helium in the reserve. If BLM sells 2.1 billion cubic feet per year in fiscal years 2013 and 2014, and 0.525 billion cubic feet in the first quarter of fiscal year 2015, the amount remaining in storage on January 1, 2015, would be 6.72 billion cubic feet.

In conclusion, Mr. Chairman, there have been a number of changes in the market for helium since Congress passed the Helium Privatization Act of 1996. As the deadline for the required actions to be taken under this act approaches, Congress may need to address some unresolved issues such as how the helium program will operate once the Helium Fund expires at the end of this year, how to set the price for the helium owned by the federal government, and how to use the remaining helium in storage.

Chairman Hastings, Ranking Member Markey, and Members of the Committee, this concludes my prepared statement. I would be pleased to answer any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

For further information about this testimony, please contact me at (202) 512-3841 or garcia Diaz@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this testimony. In addition, Jeff Malcolm (Assistant Director), Carol Bray, Leslie Pollock, and Jeanette Soares made key contributions to this testimony.

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