United States Senate
Committee on Energy and Natural Resources
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Hearing on
S. 2374, The Helium Stewardship Act of 2012

Testimony of
Walter L. Nelson
Air Products and Chemicals, Inc.

Introduction

Mr. Chairman, Ranking Member Murkowski, and members of the Committee, I appreciate the opportunity to testify before you today. My name is Walter Nelson, Director of Helium Sourcing and Supply Chain, with Air Products and Chemicals, based in Allentown, Pennsylvania, and one of the world's leading industrial gas companies.

I am well aware that helium seems like an odd subject for a hearing. For the reasons I will explain below, however, many walks of life on which Americans depend – knowing they can get an MRI when they need one, semiconductor manufacturers (and their customers) knowing that computer chips can be made without a hitch, scientists performing cutting-edge research, let alone the colorful balloons that we commonly associate with helium – will be disrupted if Congress does not act in this area. The statute that sets the framework for managing the nation's helium reserve expires at the end of 2014, but in fact the day of reckoning, under the statute, is likely to come by the end of 2013. If it does, there will be chaos in the helium supply in the United States that could cause major disruption in people's lives.

The solution is simple: with a few badly-needed tweaks, we believe that S. 2374, the Helium Stewardship Act of 2012, is the solution to prevent chaos in the helium market. Chances are you have heard little or nothing from constituents about helium over the past 15 years. That's a good thing. With enactment of S. 2374, chances are you still won't hear anything, a sure sign that the market will continue to function efficiently and effectively as it has since the creation of the Federal Helium Reserve. If, however, there are major changes in the system, and especially if Congress does not enact this extension of our tested helium system in the United States relatively soon, constituents may indeed start grumbling, and with good reason, reasons I will explain in a bit. The solution is straightforward, and does not cut on ideological or partisan lines. But time is not our friend here.

Air Products and its background in the helium market

Air Products, with revenues of roughly $10 billion per year, is an American-owned global industrial gas company. The company provides hydrogen to oil refineries so they can make clean-burning gasoline, hydrogen for fuel cell cars and buses, liquid hydrogen for NASA's space launches, oxygen for patients in hospitals and to steel mills for use in blast furnaces, nitrogen to the semiconductor industry to make computer chips, and helium for blimps and party balloons. In short, its core business is helping major industries operate more cleanly and efficiently. Air Products has 18,000 employees in 40 countries.

Air Products maintains the world's largest helium production and distribution system. It is THE industry leader in the helium field. The Company's equipment processes more than half of the helium extracted from the earth globally, and it has pioneered many of the processes critical to getting helium from the ground to vital customers, such as extraction, production, distribution, and storage technologies used in the helium industry today. Air Products has experience second to none by virtue of the United States government's selection of Air Products to engineer and construct the first helium extraction units when the federal government began its helium conservation program in 1959. More recently, Air Products designed and constructed the helium enrichment plant in 2002 that supplies the Bureau of Land Management's helium pipeline system, which continues to operate to this day.

Air Products decided to build its first helium refining plant over 30 years ago, and the plant, in Hansford County, Texas, is one of the first of its kind in the United States. The plant, designed and built by Air

Products with proprietary technology, was first operational in 1982, expanded in 1985, and it continues to operate to this day. Air Products subsequently constructed two more helium refining plants adjacent to third party natural gas processing plants, both near Liberal, Kansas. At the time of completion, the second plant was the largest helium refining plant in the world. In 1995, Air Products became the first company to design and build a helium refining plant that used crude helium that had been extracted during the production of liquid natural gas. More recently Air Products, through a joint venture with Matheson, constructed a helium refining plant in Wyoming that is expected to become operational in 2012.

In short, Air Products is the most experienced company in the world to have designed, built, and operated large commercial helium refining plants. That said, there is nothing stopping any company from building its own helium refining plants near the Bureau of Land Management's pipeline system in the United States, and indeed, several companies have done just that.

Where does helium come from?

Growing up, we never had to think about helium. It is at the party store if we want balloons. We see the helium-filled blimps at sporting events. Supplying helium, however, is anything but child's play. On earth helium is found in natural gas, and in only a few spots on the planet does helium exist in high enough concentrations to make it worthwhile to separate it from the natural gas.

There are no naturally-occurring underground reservoirs of pure helium. Helium is a rare gas and it only forms in locations where the radioactive decay of uranium occurs with the formation of natural gas. Not all natural gas fields contain helium. The largest natural gas fields that are known to contain helium, other than in the United States, are in Algeria, Qatar, Iran and Russia.

Air Products' role, like that of other industrial gas companies who are helium refiners, is to purchase crude helium both from the federal government and from energy companies that are extracting helium from natural gas. These helium refiners purify (clean up and remove contaminants), liquefy (cool to minus 452 degrees Fahrenheit so that the gas takes liquid form) and then transport and sell helium into the global retail market. Once helium is extracted, purified, and liquefied, it has a short shelf life of only 45 days before it begins to warm up and turn back into a gas, so Air Products has developed transportation technologies necessary to transport the liquid helium from the refining plant to market. Gardner Cryogenics, a subsidiary company of Air Products, has designed and constructed most of the liquid helium transportation and storage equipment used by the industry today.

For Air Products and every other industrial gas company in the United States, the Bureau of Land Management's pipeline and storage system are an integral part of this global supply chain and infrastructure. Disrupt the Bureau of Land Management's pipeline, and it would be as if two-thirds of the world's supply of oil was instantly pulled off the market – chaos would ensue, and the price would skyrocket.

The history of Congress's role in assuring sensible management of helium supplies

Helium was first discovered in the United States in 1904 in Dexter, Kansas, in a natural gas deposit. The recognition of the significance of helium to the national defense and for research and medical purposes

prompted Congress to pass the Helium Conservation Act of 1925. The first recovery and purification plant in the United States was located in Fort Worth, Texas, and produced helium in the 1920's, after which the Fort Worth plant was replaced in 1929 by a new plant located near Amarillo, Texas. From 1929 until 1960, the federal government was the only domestic producer of helium. The majority of the helium originally produced was used to support the Navy's rigid airship program, the precursor to today's blimps. During World War II, some helium was used in the Manhattan Project. Helium, in short, was vital to national defense.

After World War II, Congress advanced the cause of helium conservation through the Helium Act Amendments of 1960. Under the provisions of this law, the federal government contracted with five private operators who constructed nine crude helium recovery plants to extract helium from the natural gas that they were processing. Notably, Air Products constructed all nine of the original helium extraction units, a testament to the company's leadership in the field. The federal government then purchased all of the helium that was extracted and stored it in the Bush Dome, a geological structure within the Cliffside natural gas field located north of Amarillo, Texas. In 1973, after helium was stockpiled for 10 years in the Bush Dome, Congress decided that the United States government had enough helium in storage, and it canceled the extraction contracts.

In the early 1980's, private industry began to construct helium refining plants along BLM's pipeline, a 420 mile crude helium pipeline system that extends from northern Texas through the panhandle of Oklahoma and into Kansas, to produce high-purity gaseous and liquid helium from both private and federal crude helium supply. Between 1982 and 2000, private industry constructed six helium refining plants at different locations along BLM's pipeline system. In addition, these private companies began entering into storage contracts with the BLM to store helium in the Bush Dome, creating what became known as the BLM pipeline system, a system of helium operations unique to the United States where a series of helium extraction and refining plants are connected to a man-made helium reservoir by a very long interconnecting pipeline.

The federal government has had a long history of involvement in the helium industry, because of the perception that helium was a precious resource that should not be squandered. Under the Helium Conservation Act of 1925, the Bureau of Mines took over production of helium for military use. Under the Helium Act of 1937, the Bureau of Mines began to sell helium to private users for medical purposes, for diving, and other specialty uses. Under the Helium Acts Amendments of 1960, the Bureau of Mines was required to purchase helium from private industry under long term contracts (22 years long) at prices set by the United States government. One hundred percent of the helium purchased by the government was put into storage at the Bush Dome.

In 1973, the federal helium purchase contracts were terminated early because the federal government had accumulated more than enough helium for strategic uses as well as accumulating nearly one billion dollars of debt over the ten year conservation period to recover and store the helium. And most recently, under the Helium Privatization Act of 1996, BLM was directed to shut down and close the government-operated helium refining plant near Amarillo, Texas, and to offer for sale the 29+ billion cubic feet of crude helium stored in the Federal Helium Reserve to private industry. Congress also directed that BLM's helium reserves were to be offered for sale over a 15 year period to pay off the one billion dollar debt to the United States Treasury that was accumulated over 10 years during the helium conservation program.

The activities of BLM under the 1996 Act were also to be subject to review by the National Academy of Sciences. In 2000, NAS determined that BLM could sell off all the helium, except for 600,000 cubic feet to be left in the Federal Helium Reserve, without negatively impacting the helium market or national security. More recently, NAS issued a report in 2010 that included recommendations to the Secretary of Interior for improved management of the Federal Helium Reserve. The Academy's recommendations largely form the basis for S.2374 today.

The Federal Helium Reserve is essential to a stable helium market

BLM today operates as a natural gas producer at the Cliffside field, where it extracts natural gas from wells, separates the gas, and then sells the natural gas and helium to private industry. BLM produces approximately two billion cubic feet of crude helium annually, which is about 30 percent of the worldwide supply. The BLM system consists of the Bush Dome, an underground storage reservoir where the United States government stockpiled helium during the conservation period and into which companies that have refined helium can deposit the helium until it is used; together with 25 natural gas wells that are used to extract natural gas from the ground and a gathering system of pipes which connects all the wells together; a helium enrichment plant to process the gas; and a 420 mile crude helium pipeline system that extends from northern Texas across the panhandle of Oklahoma and into Kansas.

The crude helium enrichment plant is operated by the BLM, but the plant is owned by an entity called the Cliffside Refiners Limited Partnership (CRLP), a partnership made up of helium refiners that owned facilities on the BLM pipeline in 2000. The CRLP partners include Air Products, Praxair, Linde (formerly the British Oxygen Company), and Colorado Industrial Gas (formerly owned by El Paso Energy and soon to be acquired by Kinder Morgan). The CRLP was formed in July 2000 as a way to allow the federal government to fulfill the requirements of the Helium Privatization Act of 1996. The CRLP invested over $26 million at the Cliffside field to fund design and construction of the crude helium enrichment plant. BLM operates the CRLP-owned plant today, enabling the sale of government helium and natural gas (methane, in this case) to private industry. The CRLP companies were honored for excellence by the Secretary of Interior in 2004.

The BLM pipeline infrastructure today supports private industry by connecting eight private crude helium extraction plants and six private liquid helium refining plants to the BLM's reservoir at Cliffside. Without this pipeline system, private industry would not be able to efficiently deliver crude helium from the extraction plants to the helium refining plants in the region. The BLM pipeline system and the private industry helium plants together supply approximately two-thirds of the worldwide helium supply.

Size of the global helium market and the United States' share

The global helium market is estimated to be in excess of six billion cubic feet per year, with growth forecast in the range of three to five percent per year. The best estimates are that the United States has the largest demand, at 40 percent, followed by Asia with 26 percent, Europe at 22 percent, and the rest of world at 12 percent. The price of helium in the market is a function of many variables. Using BLM's posted price for crude helium of $84.00 per thousand standard cubic feet for 2013, the market value of the worldwide crude helium produced would be in excess of $500 million per year.

Over 75 percent of the world's helium supply currently comes from the United States. Two-thirds of the worldwide supply uses the BLM pipeline system and 30 percent originates from the Federal Helium Reserve. The Helium Privatization Act of 1996 expires statutorily at the end of 2014, at which time there will be harsh repercussions on the global economy and on our way of life if there is no successor statute.

Helium is essential in many vital walks of life

Helium has certain properties that make it essential to modern life in many respects. It is lighter than air, which is why it is used not just in balloons and blimps but in other applications such as military communications and surveillance and lifting applications where cranes are impractical. Because it is such a small element, it is used in leak detection. Liquid helium is the coldest substance on earth so it is used to keep the electrical coils in magnetic imaging machines cold, as well as for special scientific research. Other properties of helium make it ideal for cooling fiber optics and specialized electronics.

Imagine what would happen to modern medicine if MRIs were not readily available. Helium is used in garden variety welding, so imagine a trip to the auto repair shop or any large manufacturer without the ability of workers to engage in welding. Without access to helium, manufacturers of fiber optic cable would not be able to use existing processes for making the cable that is the foundation of modern communications capacity. Semiconductor manufacturers would not be able to function without helium.

The BLM pipeline system supports approximately two-thirds of the world's supply, and allowing that system to expire by failing to enact successor legislation to the Helium Privatization Act of 1996 would produce a country without ready access to MRIs, the ability to manufacture semiconductors or fiber optic cable, or much or anything else that requires welding, among other highly essential processes, let alone more frivolous uses such as party balloons.

Maintaining independence from foreign sources

In any conversation about energy, much is made of the need for the U.S. to be energy self-sufficient to the extent possible. That is true in connection with rare earth metals and other essential elements to maintaining our commerce and our standard of living. Helium is no different. Our country is blessed with helium, and we should be thankful that Congresses almost a century ago had the foresight to make sure that such an essential element was not frittered away.

If the BLM system was off limits to helium refiners because the governing statute was allowed to expire, the U.S. would not only face the calamity of a chaotic market, but also would be dependent on helium imports from foreign countries. No Congress would purposely make a decision that such dependency was a wise course of action, yet failing to enact a successor to the current helium statute would have exactly those implications.

Enactment of S. 2374 by 2013 is essential

S. 2374, the Helium Stewardship Act of 2012, would preserve a system that has accomplished important objectives: assuring supply to essential uses of helium, preserving a BLM system that has many moving parts that need to work as a whole, and at stable prices. We see no reason to tinker with the essential functioning of the BLM system. We have a couple recommended changes that we discuss below, but

overall we believe that the status quo has worked just fine for the taxpayer and for the economy. But we don't have time to spare, and here's why.

The Helium Privatization Act of 1996 directed BLM to cease pure helium production and to sell off the helium remaining in the reservoir. The Act expires at the end of 2014. The best available modeling predicts that there will still be 10-12 billion cubic feet of recoverable helium remaining in the reservoir at the end of 2014. At current production rates of about two billion cubic feet per year, the reservoir could continue to produce helium for five to six more years.

This same modeling, however, has determined that the reservoir production rates will decline to approximately one billion cubic feet per year after 2014. As a result, the usable life of the reservoir will be extended to 2018 or perhaps even 2020. This is sufficient time for new planned helium projects to become operational, replacing the lost Federal Reserve helium, but unless there is a successor statute to the expiring Helium Privatization Act of 1996, the BLM system will not be able to continue operations beyond December 31, 2014. To repeat: unless BLM has the authority to continue to operate the federal reservoir – which it won't if there is no successor statue – all of the helium that remains in the reserve will be inaccessible. That means that 30 percent of the worldwide supply will be essentially locked up, causing prices to skyrocket, some users with no ability to access helium, and chaos in the economic sectors that now rely on helium.

In fact, though, the time pressure is even worse. Under the statute, once BLM pays off the one billion dollar debt accumulated by the federal government during the helium conservation period, pursuant to the Helium Privatization Act of 1996 the self-funded United States Treasury account will be closed and BLM could then only continue operations with appropriated funds. Otherwise, there will be no funding mechanism to allow BLM to operate the federal reservoir or the 420 mile pipeline that acts as a vital supply chain for private industry. When the 1996 Act was written, Congress projected that the reservoir would be depleted by the end of 2014, when the Act expires. Helium was removed from the reservoir at rates lower than those projected at the time, however, which is why there remains helium to be managed and a successor statute necessary. Thus, the various walks of life that would come to a halt without helium would be affected not upon the expiration of the Helium Privatization Act of 1996 on December 31, 2014, but when there is no funding mechanism beyond 2013.

An important change is necessary in S. 2374 for establishing a market price for helium

If S. 2374 were enacted as introduced, there would be one major and perhaps fatal flaw, but it is one which we believe can be easily corrected. As introduced, we believe the mechanism for establishing a market price for helium is overly narrow, and will not yield a price that taxpayers would consider fair.

Air Products advocates the introduction of a market based pricing mechanism for the crude helium sold by BLM. On page eight of S. 2374, the Secretary of Interior is given authority to conduct a confidential survey and to collect data from private industry, which would be used in conjunction with federal helium royalty data, in order to help determine market pricing. Air Products supports this approach. Our concern with the language on page eight, however, is that the "inclusions" and "exclusions" stated for the survey are very prescriptive and unnecessarily limit what data the Department of Interior can request from industry, which will lead to incomplete information being used to determine the market price. In our opinion, these restrictions should be removed from the legislative language to allow all the helium market data to be collected; however, guidance must be established for the Department of Interior and BLM to ensure the market-based price methodology is sound and fair.

We strongly recommend that Congress make clear that the Department of Interior must follow specific principles when using the confidential survey data to establish the market price. First, the pricing considered must be for volumes of helium that are similar in size to those volumes currently offered for sale by the Secretary. Helium purchases of small volumes (those less than 75 million cubic feet per year) will attract spot pricing, which may be higher and therefore will distort the survey data. Second, the pricing considered must be limited to sourcing transactions where the helium is being purchased for the first time. Any prices for re-sale or wholesale helium in secondary or tertiary transactions must not be considered because these prices will include profit, which will also distort the survey data. Third, BLM has been publicly posting its crude helium price for over 15 years, and many of the helium sourcing contracts today are indexed directly or indirectly to BLM's posted price for crude helium. S. 2374 currently excludes from the survey any pricing data that is indexed to the posted crude helium price. This will severely limit the Secretary's access to information that is absolutely necessary to establish a market price. The confidential survey data must be comprehensive enough to characterize all pricing escalation indexes, including any index or reference to the BLM's posted price for conservation helium.

Clear guidance must be provided to the Department of Interior on which companies must be included in the survey, when the survey must be conducted, what data must be submitted, how the data must be classified, how the data should be interpreted, what the qualifications of the individuals to analyze the data must be, how confidentiality will be maintained, how to address non-compliance, and how to audit or validate the data to ensure falsification does not occur. Including all these requirements in the legislation is impractical. Instead, we recommend that the "inclusions" and "exclusions" section should be simplified and these details be incorporated into the Committee report and in all other reports accompanying this legislation. We look forward to working with the Committee to refine this important point.

Answering possible objections to the Helium Stewardship Act of 2012

The government serves an essential role

At a time when the federal government is looking to have the private sector take on functions previously handled by government, there could be some who might ask why a federal reservoir should exist at all. Why not just turn it all over to the private sector?

That was exactly the thinking of Congress in 1996, and the consequence was the Helium Privatization Act of 1996, which reflected Congress's support for privatization to the extent possible. Getting the government out of the helium business altogether, however, is no more possible today than it was in 1996. The 1996 statute directed BLM to cease pure helium production and marketing. This resulted in the closure of the United States helium production plant that previously sold helium directly into the private sector market. BLM was also directed to offer for sale the approximately 29+ billion cubic feet of crude helium that had been stored in the reservoir. This sale, however, could not happen overnight. The helium in the reservoir is mixed with natural gas, and it is a complex operation to manage the geologic dynamics of the reservoir as the gas is being extracted from the ground. If the valve was simply left wide open to deplete the entire supply at once, valuable helium would be stranded in the ground and never recovered.

Today, the federal government retains ownership and management of the reservoir, the production wells, the gathering system, and the 420 mile pipeline distribution system. The helium enrichment unit

and pipeline compressor stations are owned by private industry, but they are operated by employees of BLM under contract to the CRLP, the consortium of private companies that refine the helium. In our opinion, BLM is the only entity that can oversee the drawdown of this strategic asset to the benefit of the government and private industry. Turning over BLM's functions to one or more private companies simply is not feasible.

Legislation should not mandate allocations of helium

Some have been heard to argue that BLM has set up what is essentially an oligopoly, and that others wishing to buy helium should simply be allowed to buy from the helium refiners for a fee set by statute. The answer is that any party can negotiate to buy helium from a refiner, but Congress should not insert itself into the middle of commercial transactions. Commercial arrangements are entered into all the time that allow those without helium refineries to buy agreed-upon quantities of helium from those that do have refineries. These are referred to as tolling arrangements. But surely it is not the role of Congress to pass statutes that force refiners to sell at a set price, or to force refiners to share their refining capacity with companies that chose not to build their own refinery.

The refiners made enormous investments at the time they built refineries on the BLM pipeline. Several industrial gas companies chose not to make such an investment. Those industrial gas companies that chose not to make similar investments presumably made what to them were sound business decisions, and spent their capital elsewhere. For Congress in 2012 to give those companies the ability to force the refiners to sell at a set price would be totally un-American and contrary to the basic principles of capitalism. Nothing in S. 2374 stands in the way of any company entering into a tolling arrangement at a mutually agreed-upon price.

The 1996 Act did not impose restrictions on who could purchase helium from the federal government. Any third party company that wanted to enter the helium refining business and purchase helium from the federal government could have made investments as early as 1996, and could do so to this very day and into the future. Surely, it is not the role of Congress to turn back the hands of time and allow companies that opted not to make such investments to enjoy the benefits accruing to those who did.

Neither the 1996 Act nor S. 2374 imposes any restrictions on who can purchase helium from the federal government. Instead, the Department of Interior, under Administrations of both parties, limits the sale of helium from the federal reservoir to what it calls "qualified buyers" – an entity that must have the ability to receive and process the crude helium sold by the government. Any company can enter the helium refining business with the requisite commitment of its resources. BLM's interest in selling to qualified buyers is to prevent companies from stockpiling crude helium. BLM determined that helium refiners were in the best position to process the crude helium, which requires purification and liquefaction prior to being introduced into the helium wholesale or retail market.

Interestingly, BLM initially offered 90 percent of the helium in the reservoir to the refiners and left 10 percent as unallocated, to be purchased by companies that were not refiners. But there was very little demand for the unallocated portion. Since BLM's desire was not to sit on unnecessarily large quantities of helium in the reservoir, BLM raised the allocated amount to 94 percent. Any suggestion that this level poses an obstacle to any company wishing to purchase helium for its customers simply does not comport with the facts. S. 2374 does not set the allocation level; BLM does, and for reasons that benefit the U.S. taxpayer and the users of helium.

Banning exports of helium is contrary to free trade policy and likely illegal

Finally, some have suggested that there should be a ban on the export of helium. The United States currently supplies approximately 75 percent of the world's supply of helium. This helium goes into a global market. For instance, a company manufacturing magnetic imaging machines in the U.S. that supplies them globally requires helium to be shipped from the U.S. to wherever the equipment is placed in service abroad.

Banning the export of helium would not only appear to offend various trade laws and treaties, but it would invite foreign governments to forbid the export of precious materials that U.S. manufacturers need in their production processes. Enacting export restrictions makes no more sense here than it does in connection with other commodities that are in commerce throughout the world. Indeed it is likely that we will eventually be importing helium, so to ban exports now only invites retaliation.

Conclusion: The time for Congress to act on helium is now

Congress got it right when it established the federal helium reservoir and the surrounding infrastructure managed by BLM. The system has worked well for decades. Congress got it right yet again in the Helium Privatization Act of 1996 when it set in motion a process for selling off the helium previously captured in the federal reservoir. End users have had helium when they need it, and price and access have been stable. The public does not think much about helium – aside from party balloons and blimps – because the system has worked so well.

We believe that with the few changes we recommend to S. 2374, enactment of the Helium Stewardship Act of 2012 would continue this tradition of a system that works so well that hardly anyone even knows it exists. But let the 1996 Act expire without enactment of S. 2374, and helium will be a household term, and not in a good way. Doctors and patients needing MRIs will panic. Semiconductor manufacturers, the nation's leading exporters, will be caught short. And the list will go on. These problems will unfold by the end of 2013 if there is no mechanism in place to fund BLM's helium operations, and BLM will indeed be out of business regarding its management of the Cliffside reservoir unless Congress acts.

Air Products appreciates the opportunity to share its expertise with the Committee, and looks forward to working with the Senators and staff to make sure a bill is crafted that will spare the country needless problems. We will do whatever we can to see to it that this issue is addressed by Congress before catastrophe strikes.

Walter L. Nelson
Director, Helium Sourcing & Supply Chain
Air Products and Chemicals, Inc.
7201 Hamilton Blvd.
Allentown, PA 18195-1501
Tel (610) 481-4911
nelsonw2@airproducts.com